IBL CALCULUS

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• Assistant Director for the Academy of IBL

• User of IBL since 2007

• Ultra marathon runner
What is IBL/active learning?

- Here you all briefly share what you know about IBL and/or active learning.
IBL Experience

• Courses for developing proof skills
• Courses for future teachers
• Courses for practicing teachers
• Outreach for students
• Outreach for teachers
Why IBL calculus, if it is so “hard”?

• Nationwide calculus study

• Calculus is considered the “gateway” course for many STEM disciplines

• Many students are NOT successful in Calculus I, and of those that are, many struggle in Calculus II

• Desire to increase the quantity and quality of future math teachers
What does IBL Calculus mean?

• Students are activity engaged

• Few traditional lectures are given

• Activities selected to guide students into developing their own understandings
What did IBL Calculus look like for me?

• The classroom – START with a room well-suited for group work – tables!

• Little introduction – worksheets distributed regularly with students working together

• Traditional University Calculus textbook
Group Structure

- Depends on instructor

- Me - students self-select groups at the beginning of the semester
  - Shop around for 1-2 weeks before picking groups

- Others - switch on some consistent basis
Homework & Assessments

• Homework collected and graded for completion DAILY

• Take-home quizzes given WEEKLY

• Two-part tests (in-class & take-home) given every three weeks

• Tests were significantly HARDER than before IBL
IBL part of the assessment

• Students graded on participation in class, with points awarded for level of work within the small group activities

• Student presentations required, with points awarded for work presented to the entire class
Sample Classroom Activity

\[ f'(x) > 0 \] and \[ f''(x) = 0 \] everywhere.
Integral Dominoes!

- Matching integrals to their antiderivatives
- Self-checking
Developing a classroom culture

• Homework room was held daily – students worked together on assignments

• Instructor met with groups of students to provide suggestions – not answers!

• Group work on take-home quizzes
Success with IBL calculus

• UNL’s engineering department now requests a full section be saved for their first year students

• Pass rates are higher in IBL sections than any other sections

• Many IBL calculus students have now graduated with math degrees

• Classroom attendance was VERY HIGH – students knew if they were absent, they would miss out! There was good reason to come to class!

• IBL calculus changed the face of the mathematics education majors at UNO – diversified, increased quantity, increased quality

• Full notes have been written for group work style IBL calculus (I and II)
Questions

• How do you cover all of the material in an IBL calculus class?

• Your turn...
Thank you!

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