

Introducing Active Learning Strategies to Large Intro Courses

**Earth Educators' Rendezvous,
July 18-20 2016**

Rachel Teasdale

Geological and Environmental Sciences
California State University, Chico

David A. McConnell

Marine, Earth & Atmospheric Sciences
North Carolina State University

Introducing Active Learning Strategies to Large Intro Courses

ICE BREAKER

Go to the location designated for:

- Class type (physical geology/earth science/atmospheric science & climate/environmental science/other)
- Number of intro classes per year (0-1/2-3/4-5/6+)
- Number of years teaching (0-2/3-6/7-12/13-20/>20)
- Type of institution/program (PhD/MS/BS/2YC/Other)
- Form a number line by **size of class**
 - <50 to → >200

Introducing Active Learning Strategies to Large Intro Courses

SPEED INTRODUCTIONS

Three things:

1. Who you are
2. Where you are from
3. Best teaching moment

Introducing Active Learning Strategies to Large Intro Courses

WORKSHOP GOALS

1. Analyze existing exemplary resources as models for lesson development
2. Generate appropriate teaching strategies or activities to match learning objectives and assessments
3. Redesign/design sample lessons to promote student learning

Introducing Active Learning Strategies to Large Intro Courses

Active Learning vs. Traditional Lecture

Active learning engages students in the process of learning through activities and/or discussion in class, as opposed to passively listening to an expert. It emphasizes higher-order thinking and often involves group work.

(Freeman et al., 2014)



<http://www.ecampusnews.com/News/2010/10/classroom1.jpg>

Traditional lecturing - Continuous exposition by the teacher. Student activity limited to taking notes and/or asking occasional, unprompted questions of the instructor.

Freeman et al., 2014, Proceedings of the National Academy of Sciences v.111, #23 p. 8410-8415.

Introducing Active Learning Strategies to Large Intro Courses

Self-Inventory Activity

Post-it Note Task

1. Write two words or a short phrase describing why you are interested in using active learning
2. Write two words or a short phrase summarizing barriers to the implementation of active learning

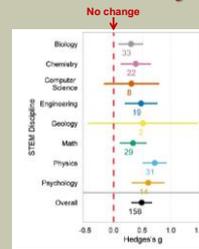
Place notes at locations indicated. Review posted notes, briefly discuss with colleagues, report out.

STUDENT ACTIVITY AND LEARNING

Humans are not information storage machines who receive deliveries of information and store the deliveries in memory. Instead, **humans are sense-makers** who engage in active cognitive processes during learning such as selecting relevant words and pictures, organizing the selected materials into verbal and visual mental models, and integrating the verbal and visual models.

Richard E. Mayer
Multimedia Learning, 2009, p.158

Why Active Learning?



1. Failure rates (DFW) in active learning classes less than in traditional format, 34% → 22% (n=67 studies; 28,300 students)

3. Helps all students, reduces performance gaps



2. Students in active learning classes out-performed those in traditional classes by ~6% on exams (n=158 studies)

Freeman et al., 2014, Proceedings of the National Academy of Sciences v.111, #23 p. 8410-8415.
Wierman, 2014, Proceedings of the National Academy of Sciences v.111, #23 p. 8319-8320.

DAY 1 WORKSHOP OBJECTIVES

After Day 1, workshop participants will be able to:

1. Describe examples of multiple examples of active learning exercises.
2. Discuss the principal components of an active learning activity.
3. Reflect on which components of activities are best suited to your class(es).
4. Identify a potential topic suitable for an active learning activity.