

# Introduction to Active Learning and Active Learning Classrooms

Seminar leaders:

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## Session Objectives

- Describe the elements of active learning pedagogy
- Identify the benefits and challenges of active learning pedagogy
- Investigate aspects of classroom designs that can be used for active learning

# What is active learning?

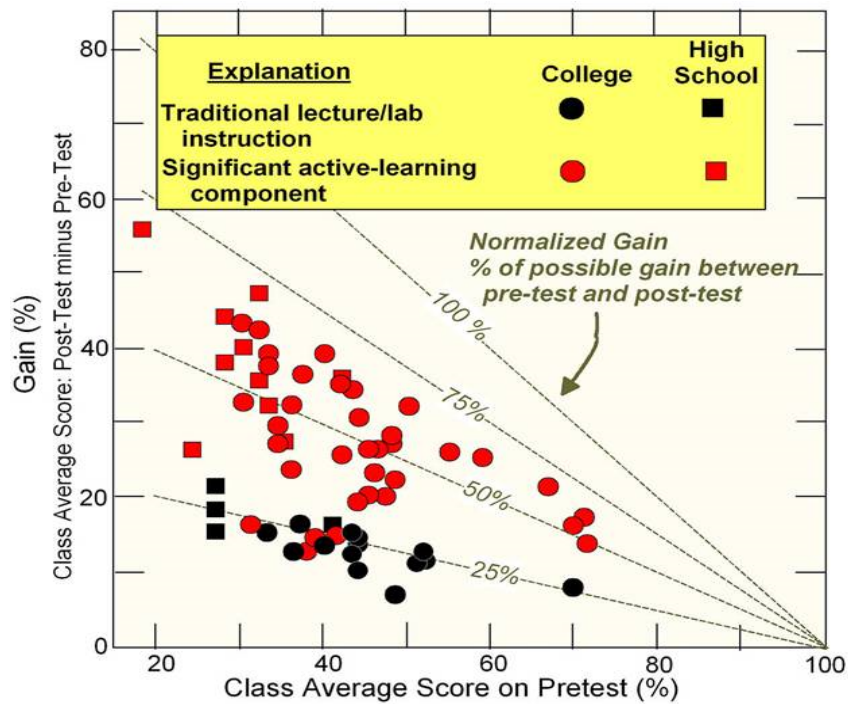
- What does “Active Learning” mean to you?
  - How would you define “active learning”?

Think – pair – share

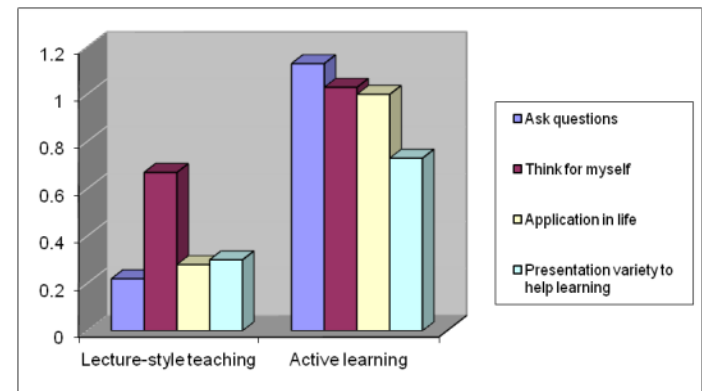
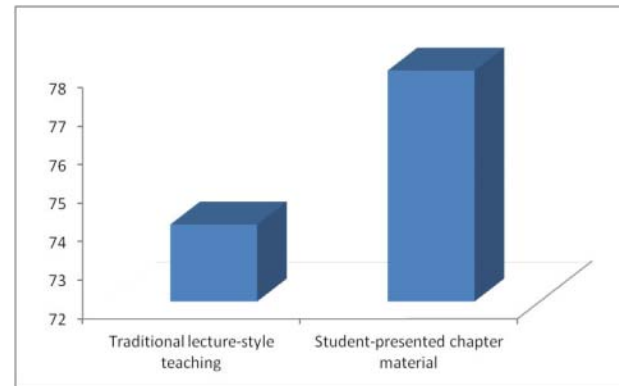
1. THINK about the question first; jot down some notes
2. PAIR with someone else and discuss
3. SHARE within you table group

# Active Learning Defined

- “Learning activities where students do more than just listen: They must read, write, discuss, or be engaged in solving problems. Most important, to be actively engaged, students must engage in higher order thinking tasks such as analysis, synthesis, and evaluation” – Bonwell & Eison 1991
- “We might think of active learning as an approach to instruction in which students engage the material they study through reading, writing, talking, listening, and reflecting. Active learning stands in contrast to "standard" modes of instruction in which teachers do most of the talking and students are passive”. U Minn website 2014



The impact of active learning on student learning is illustrated in this graph that illustrates class averages on pre- and post-tests of fundamental conceptual knowledge in first-semester introductory physics. Learning gains in active-learning classes are typically two to three time higher in comparison to lecture courses. The data set includes more than 6500 students in 62 classes. (From [R. Hake, 1998, Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses, Am. J. Phys. 66: 64-74](#))



Velislava Karaivanova and Tammy Atchison, Pitt Community College in Greenville, North Carolina. Study of intro bio and chem courses where the same content was delivered in different methods in different semesters. Learning Abstracts 2013 volume 16, Number 1

# Benefits to Active Learning

- Improved student understanding (Kvam 1999; Crouch and Mazur, 2001; Handelsman et al. 2004)
- Improved student retention in general student population and in underrepresented minorities (George et al. 2001; Cortright et al. 2003; Lorenzo et al. 2006)
- Improved attitude, problem-solving skills, and conceptual learning (Beichner et al. 2007, Yehudit et all 2003)

## Other terms related to active learning

- Experiential Learning – can be used to indicate activities with a service or other applied element. Can be “on-the-job” type learning (e.g. internships etc)
- Problem Based Learning
- Inquiry-based learning
- Academic Service Learning
- Interactive Learning
- Cooperative learning
- Many others...



# Engagement

- What does student engagement mean?





# Elements to Active Learning

## Talking and Listening

- When students talk about a topic
  - they organize and reinforce what they've learned.
- When they listen
  - meaningful listening
  - relating what they hear to what they already know

## Writing

- When students write, they process new information in their own words
- Useful in large class situations where talking in groups can be hard
- Appeals to individuals who prefer to learn independently

# Elements to Active Learning

## Reading

- Summary and note checks can help students process what they've read
- Develops the ability to focus on important information

## Reflecting

- In the typical lecture class, the lecturer stops talking at the very end of the period.
- Allowing students to pause for thought, to use their new knowledge to teach each other, or to answer questions on the day's topics is one of the simplest ways to increase retention.

# Challenges of Active Learning

- *What makes it difficult?*
  - New paradigm for students
  - Time and work issues for faculty
  - Lack of training for faculty
  - Spaces not conducive to active learning



# Activity

*Each group will be given a photo of a classroom environment.*

How conducive is this room to:

- Lecture
- Instructor led discussion
- Student led discussion
- Students working in groups
- Students taking tests
- Student – instructor interaction (one-on-one)
- Student comfort level
- Other characteristics that would affect the class

# Group 1: The “Old school”

**Tiered auditorium-style lecture hall**

**Capacity:** 500

**Student furniture:** Theater-style seats with tablet arms

**Other features:** Dual projectors/screens; instructor document camera; wireless video system that enables any student’s laptop to connect to projector.



## Group 1: The "Old school"



## Group 2: “The Trapezoid”

**Flat-floored classroom**

**Capacity:** 42 students

**Student furniture:** Trapezoidal tables (moveable); chairs on casters

**Other features:** Several whiteboards; projector and screen; instructor document camera; wireless video system that enables any student’s laptop to connect to projector.



## Group 2: "The Trapezoid"





## Group 3: “The Double”

**Tiered lecture hall**

**Capacity:** 80 students

**Also comes:** Jr sized (40 seat case study room) and super-sized (150 seat lecture hall)

**Student furniture:** Two rows of tables on each tier; chairs on casters

**Other features:** Whiteboards at front and back of room; dual projectors and screens; instructor document camera; wireless video system that enables any student’s laptop to connect to projectors.



## Group 3: "The Double"



## Group 4: "The SCALE-UP"

**Flat-floored classroom**

**Capacity:** 36 students

**Student furniture:** Round tables (fixed); chairs on casters

**Other features:** Several whiteboards; dual projectors/screens; student and instructor document cameras; 55-inch LCD screens at each student table; wireless video system that enables any student's laptop to connect to LCD screens or projector.



## Group 4: "The SCALE-UP"



## Wrapping up

- Many types of active learning – key common denominator is that students are engaged in higher order thinking tasks.
- Research has proven the value of active learning.
- Learning space types affect ease with which different types of delivery methods and activities may be used.

Start thinking about how you might incorporate active learning into your courses, and in the classrooms you use.