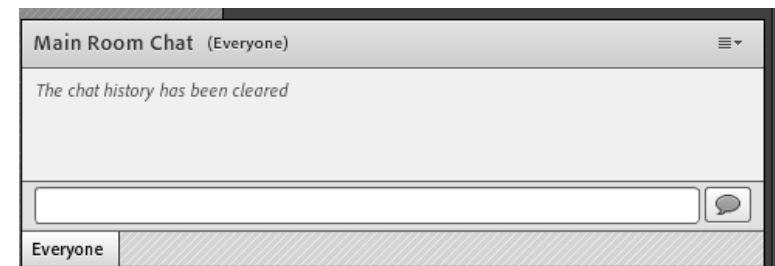
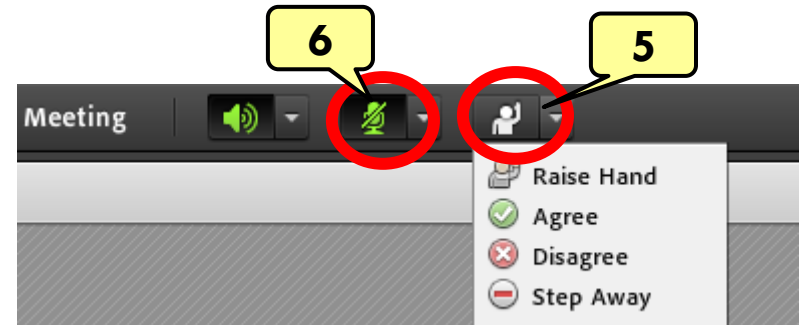
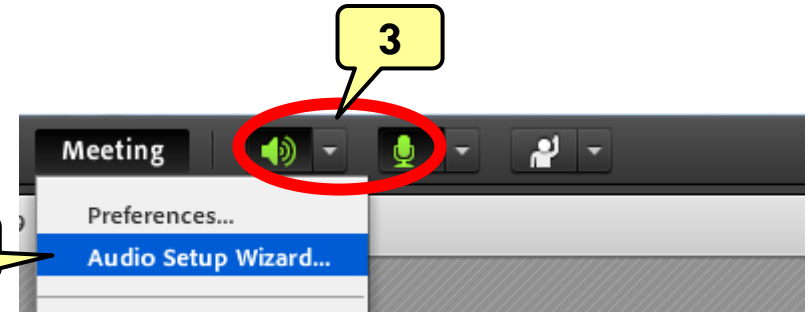


Welcome! As you enter the room, please...

- ❑ Plug in your headset (if available).
- ❑ Enable your speakers and mic (the icons on the top bar should be green).
- ❑ Run the audio setup wizard (see the “Meeting” menu on the left of the screen).
- ❑ “Raise your hand” by clicking the icon to let the hosts know you are ready to test your mic.
- ❑ After testing your mic, mute yourself by clicking the mic icon (to avoid background noise).

Feel free to use the chat at any time!





Start Recording!

ECE Virtual Community of Practice



Session 2

Active Learning Strategies

November 4, 2013

Tentative Agenda

- Logging in, welcome, session goals (5 minutes)
- Responses to Readings (15 minutes)
- Introduction of Working Groups
 - Breakout and report outs (30 minutes)
- Pursuing an Active Learning Strategy
 - Breakout and report outs (30 minutes)
- Plans for Session 3 (10 minutes)

Rules of Engagement

Create your own bubble of solitude:

- ❑ Close your office door
- ❑ Use a “Do Not Disturb” sign
- ❑ Turn off e-mail
- ❑ Silence or forward phone
- ❑ Avoid any other potential distractions

ECE VCP Session 2 Goals

- Continue building our Community of Practice (CP)
- Discuss active learning readings including
 - ▣ Things learned
 - ▣ Questions
- Meet members of ECE Working Groups and engage in initial discussions
- Design an active learning exercise for your Spring 2014 class

Homework Readings

□ Reading

- M. Prince. (2004). Does active learning work? A review of the research, *Journal of Engineering Education*, 93(3), pp. 223–31.
 - M. Prince & R. M. Felder. (2006). Inductive teaching and learning methods: Definitions, comparisons, and research bases. *Journal of Engineering Education*, 95(2), 123-138.
 - K. Smith, S. Sheppard, D. Johnson, & R. Johnson. (2005). Pedagogies of Engagement: Classroom-Based Practices, *Journal of Engineering Education*, 94(1), 87-101.
- One thing you learned from the reading
 - One question you have

Poll: Active Learning Readings

- Which of the homework readings for this week was most useful to you?
 - ▣ M. Prince. (2004). Does active learning work? A review of the research
 - ▣ M. Prince & R. M. Felder. (2006). Inductive teaching and learning methods: Definitions, comparisons, and research bases
 - ▣ K. Smith, S. Sheppard, D. Johnson, & R. Johnson. (2005). Pedagogies of Engagement: Classroom-Based Practices
 - ▣ I didn't read the articles.

What is Active Learning?

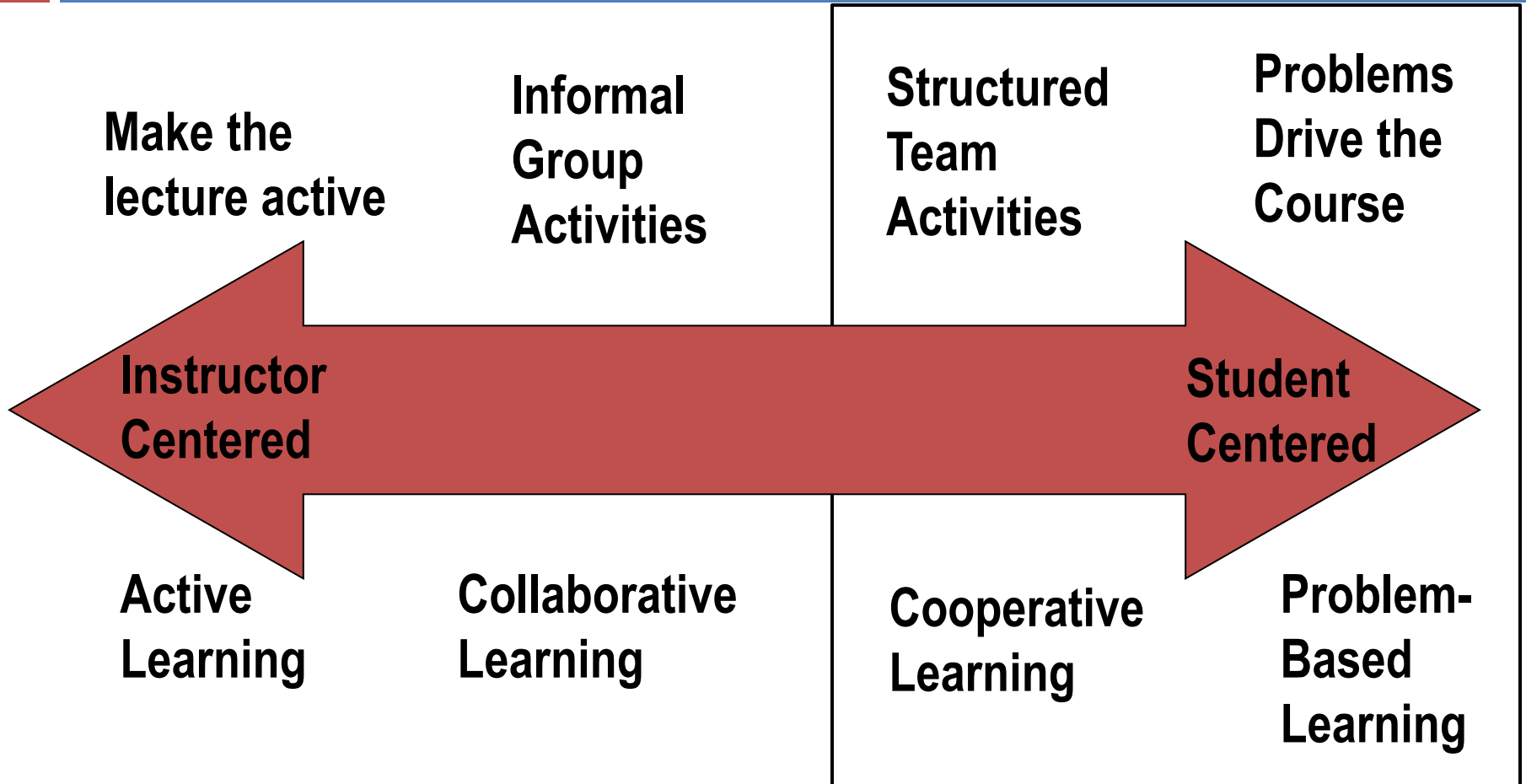
- Any instructional method that actively engages students in the learning process.

“Education is what happens to the other person, not what comes out of the mouth of the educator.” *Myles*

Horton

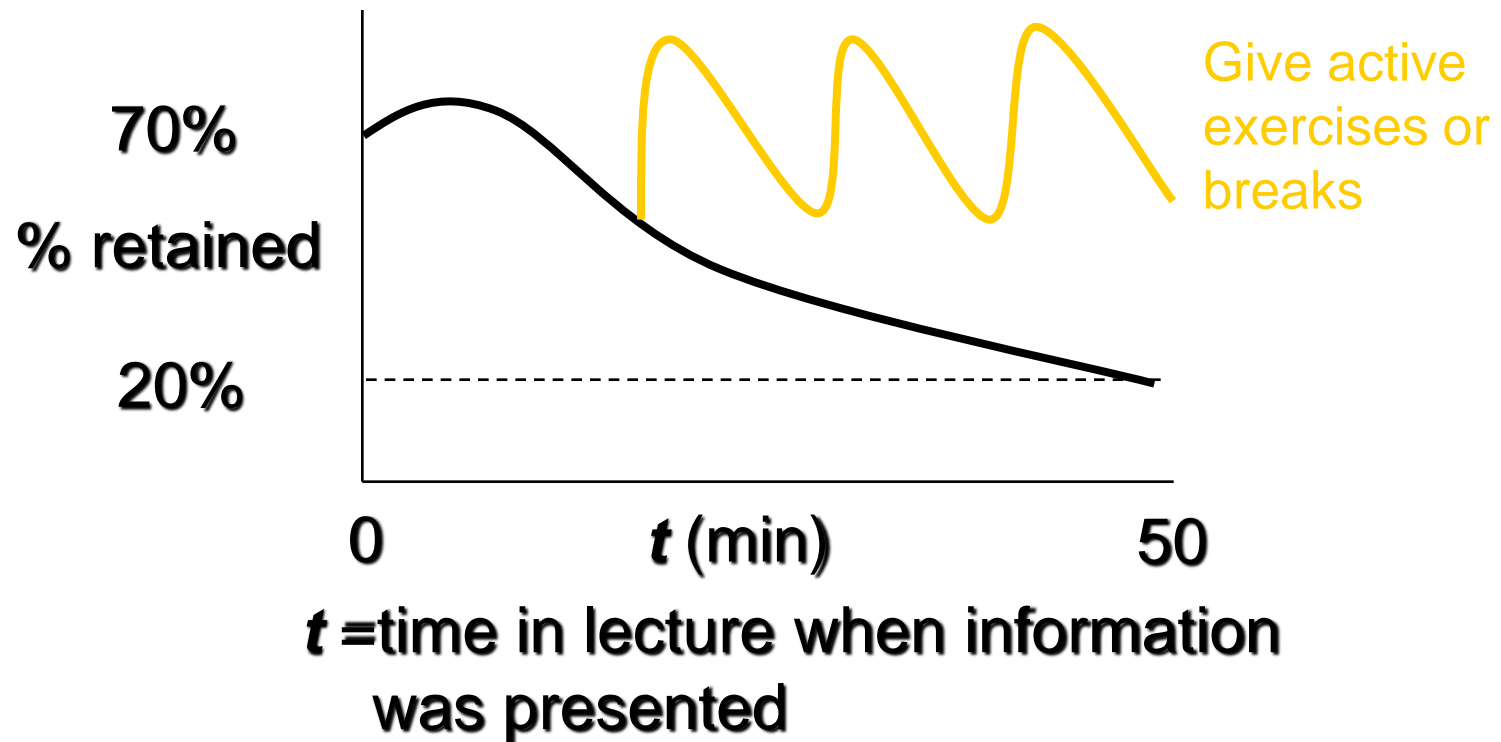


The Active Learning Continuum



Strong Evidence Base – Cooperative Learning & Challenge-Based Learning

Experimental study: Gave 50-minute lecture, tested immediately afterwards. Results:



What do you think the curve looks like?

Examples of Active Learning

- In-class Teams
- One Minute Papers
- In-class Concept Tests with Clickers

- **MANY** more....

In-Class Teams

- Form teams of 2 to 4, choose recorders. Give 30 seconds - 3 minutes to
 - *Answer a question*
 - *Start a problem solution*
 - *Work out the next step in a derivation*
 - *Think of an example or application*
 - *Brainstorm*
 - *Generate a question*

- *Call on several individuals for responses first. Then take responses from volunteers. This always works, regardless of class size.*

Minute Paper (Clearest/Muddiest Point)

- Stop 2 minutes before class period ends.

- Ask students to write

- ▣ Main Point(s) of the lecture
- ▣ “Muddiest” (least clear) point(s)



- Collect papers. Use responses to plan next lecture.

Concept Tests with “Clickers”



- Ask class a multiple choice question
 - ▣ Conceptual, challenging
 - ▣ Good distractors based on common misconceptions
- Students vote individually. Then discuss answers in pairs. Then revote.
- Discuss **why** wrong answers were wrong
- Useful in large classes



Poll: Active Learning Strategies



- After reading more about active learning, what strategies interest you most?

Homework Summary: Insights

- There is **a lot** of evidence that active learning works! (This can be very useful for convincing skeptical colleagues.)
- Similar active learning strategies may have different names in different fields – it's helpful to know the definitions.
- Different strategies develop different types of skills and work well in different types of courses; it's not always easy to determine what strategies to choose.

Homework Summary: Questions

- ❑ Do more involved techniques (flipped classroom, PBL) provide significant learning benefit over the simple options (minute papers, TPS)?
- ❑ What is the best way to tailor active learning strategies to ECE courses?
- ❑ How do we get students to buy in to active learning?
- ❑ What are effective assessment strategies to use with active learning methods?
- ❑ Can active learning strategies be implemented successfully in MOOCs?
- ❑ How do we appropriately challenge students at different levels? How do we structure groups to ensure that each student learns?
- ❑ How do active learning methods affect lower performing students who may lack individual motivation?
- ❑ How can we design problems that will guarantee that students master a set of outcomes for a higher level course?

ECE VCP Working Groups

□ Group 1

- Nuri Emanetoglu, Electronics
- Puteri Megat Hamari, Electronics
- Nisha Kondrath, Electronics
- Harry Powell, Electronics

□ Group 2

- Shiny Abraham, Circuits
- Liz Brauer, Circuits
- Alisa Gilmore, Controls
- Raghu Mudumbai, Circuits
- Aurenice Oliveira, Signals & Systems

□ Group 3

- Kennedy Aganah, Energy Conversion
- Tim Kane, E&M
- Nathalia Peixoto, Circuits
- Nuri Sisworahardjo, Circuits
- Sandra Soto-Caban, Circuits/Electronics

□ Group 4

- Danai Chasaki, Computer
- Mary Knox, Signals & Systems
- Faramarz Mossayebi, DSP
- Matthew Watkins, Digital

Breakout Groups Tasks

- Roles for Today: Person with Last Name
 - ▣ **First** alphabetically is the **scribe** to record discussion on electronic notepad
 - ▣ **Second** alphabetically is the **reporter** to share important points in report out
- Each member of the group should share (start with **scribe**)
 - ▣ Favorite part of teaching
 - ▣ Fun fact
 - ▣ 1 new active learning strategy you would like to try
- Time allotted: 20 minutes in breakout groups
10 minutes for report out

Breakout Groups Tasks

- Roles for Today: Person with Last Name
 - ▣ **First** alphabetically is the **scribe** to record discussion on electronic notepad
 - ▣ **Second** alphabetically is the **reporter** to share important points in report out
- Decide on an active learning exercise to pursue in your Spring 2014 class
 - ▣ What will students do in the exercise?
 - ▣ What will students learn from the exercise?
- Time allotted: 20 minutes in breakout groups
10 minutes for report out

Plan and Assignments for Session 3: Bloom's Taxonomy and Learning Objectives

□ Reading:

▣ Review the following websites about Bloom's Taxonomy and revisions to Bloom's Taxonomy

- cft.vanderbilt.edu/teaching-guides/pedagogical/blooms-taxonomy/

- www4.uwsp.edu/education/lwilson/curric/newtaxonomy.htm

- www.celt.iastate.edu/pdfs-docs/teaching/RevisedBloomsHandout.pdf

▣ Read (posted on portal) and be prepared to discuss

- Appendix D of *How Learning Works*: What are learning objectives and how can we use them?

- M. Besterfield-Sacre et al., *Defining the Outcomes: A Framework for EC-2000*, *IEEE Transactions on Education*, 43(2), 2000.

Homework for Session 3:

Bloom's Taxonomy and Learning Objectives

- Deadline: 12 pm EST Monday (11/11).
- Post to blog **one thing you learned** from the reading and **one question** you have.
- Review each other's syllabi in your working group (posted to portal under Evaluation)
 - For each syllabus, list 1 thing you learned or found interesting.
 - For each syllabus, provide 1 suggestion for improvement.
- Prepare a learning objective for your Spring 2014 course related to the active learning exercise you considered in Breakout Session 2.

**Upload your homework (your syllabus reviews and your learning objective) to the Session 3 Homework folder.
Name your file yourlastname_nov11.**