

Active Learning Strategies

Getting started

- Start small and be brief
- Work with a colleague to develop questions. Test your question on a colleague or teaching assistant.
- Start from the first day of class. Most students expect to just sit in a lecture class, but they can be trained!
- Tell students why you are doing this
- Determine a “stop talking” sign
- Randomly call on pairs to share
- Once you try an activity, collect feedback. Then modify it and try again.

Planning an Active Learning Activity

The following questions will help you clarify your goals and structure as you plan an active learning activity:

- What are your goals/objectives for the activity?
- Who is interacting? Will students pair up with someone beside them? Or perhaps someone sitting behind/in front of them? Should they pair up with someone with a different background? Someone they don't know yet?
- When does the activity occur during the class? Beginning? Middle? End? How much time are you willing to spend on it?
- Will they turn in the responses or not? If they are asked to turn them in, should they put their names on them? Will you grade their responses or not?
- How will they share the paired work with the whole class? How will you share the feedback and insight you gain from their responses?
- If they are responding to a question you pose, how are you going to ensure that they leave with confidence in their understanding? Often, if the various student answers are not discussed without the instructor explicitly indicating which ones are "right", students become frustrated
- What preparation do you need to use the activity? What preparation do the students need in order to participate fully?

General Guidelines for Paired Activities

- Be candid with the students as to why you are asking them to do these things. Explain attention span, the need for engaging material, and that research shows better learning occurs by using active learning.
- Give students time to write their answers down. This makes the answer more coherent, and further cements the concept in their minds.
- Have students occasionally turn in the work. Read a sample then give them feedback.
- Make sure your informal activities are reflected in your formal evaluations. For example, include a question on your exam that was used in a think/pair/share.

Activities that encourage **Reflection & Integration**

At the start of class....

- Start class with a question that is either from the last class or that tells them what they will be learning (a pre-test of sorts)
- Pose a problem or paradox
- Have students make a list or brainstorm
- Invite discussion or questions

During class...have a Clarification pause / note review / share notes

Allow students to assimilate information and compare notes, to clarify lecture concepts and to increase accuracy in note-taking. (Studies have shown that even pausing for a few minutes in a lecture increases student retention!)

At the end of class...Have students reflect on your lecture:

- What was the most important concept?
- The muddiest concept—What's not clear?
- How does today's topic connect with _____?

Activities that encourage **Analysis**

Think-pair-share

The instructor poses a question or problem. Individuals are given a minute to reflect on and write brief notes in response. Students pair up with someone sitting near them and share their answers verbally for two to three minutes, or they may choose to work together to create a better answer. The instructor chooses a few pairs to give summaries of their answers, or collects for grading. *NOTE: the advantage of this is that students are much more willing to share their thoughts if he/she has collaborated with another student.*

Think/Pair/Square

As above, except after 2 students discuss the issue, they then get together with another pair and confirm their thinking. The 4 students agree on a consensus answer

ConceptTest (Mazur 1997)

The instructor poses a multiple-choice question that requires conceptual understanding. Students answer using clickers, cards or fingers to answer (see below). If desired, students can then talk to peers and answer again. The responses can be used to structure remaining lecture.

Quick Thinks (Johnston & Cooper 1997)

- reorder steps in a process
- paraphrase statements
- correct an error
- support a statement with evidence

Exam questions (debriefing and practice)

Use old exam questions to connect class with exams, to give them practice and to let students know what to expect. A spin on this is to have students write exam questions and turn them in.

Predict the demo

Make prediction for an experiment (real or described). Do the experiment and discuss what happened.

Data analysis

Give students graphs, tables or images and ask them to interpret the data. Ask: What do these data tell you?

Games

Ask question or pose problems using a “Jeopardy” or “Who wants to be a Millionaire” format

Activities that encourage Active Testing

Role playing

In a large lecture room, you can divide the room into sections, and have students plan in class, or you can give a home work assignment, and have them plan ahead of time. Students and/or staff act out various processes. Complex processes like photosynthesis and respiration lend themselves to such tasks well.

Jigsaw

Each student is responsible for learning a piece of the whole project. Students then come together to fit the pieces together into a whole by teaching each other what they learned.

Debates / structured controversy

Students, in groups, are assigned a viewpoint. They then prepare and present and defend their side. Emphasize that students need evidence to support their side, and allow them ample time for research.

Reference

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A few of the many Web sites:

Paulson and Faust, Cal State at Los Angeles
<http://www.calstatela.edu/dept/chem/chem2/Active/index.htm>

Derek Bok Center for Teaching And Learning
<http://isites.harvard.edu/icb/icb.do?keyword=k1985&pageid=icb.page29696>

the Foundation Coalition
<http://www.foundationcoalition.org/index.htm>