Making the Transition to Active Learning

from

“Engineering an Engineering Education”

3-day Workshop

Bucknell University – July 2009
Defining Active Learning

• Any instructional method that actively engages students in the learning process.
• Requires students to do meaningful learning activities that promote intellectual engagement.
Lecturing

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

- (Myles Horton)
What does the data say?

Even if you are fascinating....

People only remember the first 15 minutes of what you say.
One Easy Suggestion:
Break Up Lectures
Success in Classroom Active Learning

• The text *Classroom Assessment Techniques*, by Angelo and Cross, lists 50 different techniques or tasks that can be done, during class time, to assess student learning.

• All these tasks require the kind of active learning we want students to be able to do in the classroom.


[http://www.uoregon.edu/~tep/resources/newteach/fifty_cats.pdf](http://www.uoregon.edu/~tep/resources/newteach/fifty_cats.pdf)
One minute paper

• Construct one or two questions that students can answer quickly and briefly. Put the questions on an overhead/whiteboard/PowerPoint

• Set aside the first or last 5 minutes of class for the 1-minute paper.

• Distribute index cards or ask students to use a half-sheet of paper to write their responses.

• Ask students to respond to the questions frankly and concisely. They may use single words, short phrases or very short sentences.
One minute paper – some possible questions

• What was the most important (significant, crucial) thing you learned in today’s class?

• List 3 key concepts from today’s class.

• What is the main application of the material we discussed today?

• What did you learn today that you will use or apply after graduating?
More CATs

The muddiest point

• What was the muddiest point in the (lecture, discussion, homework assignment, ...)

• Ask for phrases or sentences

• Should be asked toward end of lecture
More CATs

One-Sentence Summary

• Answer the question:
  “Who
does what
to what (or whom)
when
where
how
why?

• Example – Summarize the electronic design process.
More CATs

Directed Paraphrasing

• Reveals student’s ability to summarize and restate important information or concepts
• The summary is to be aimed at someone who does not know the information
  – “Explain to your mother . . .”
• Example – In plain language and in 5 minutes, explain to a computer user why they should use virus-protection software
More CATs

Applications Cards

• Lets instructors know if students can look ahead to see application of technical information
• Have the students write down one possible, real-world application for what they have just learned
  – Example: Write down 2 lost-cost applications for using transistors in a electronic device
Success in Classroom Active Learning

• Make sure to “close the loop.” Let students know what you learn from their feedback, and how you and they can use the information to improve learning.

   – Students are unlikely to realize the value of their hard work (thinking hard during class), unless faculty make them explicitly aware of the technique and their goals.