

Large Class FAQ: Active Learning Elements

1. How can I develop students' writing and speaking skills?

- Collect and give some kind of credit for short, in-class writing assignments, including responses to a question or problem, minute papers, student profiles, and group quizzes. This gets students in the habit of writing and gives you quick feedback.
- Assign brief out-of-class writing as homework and ask students to submit as e-mail or collect only from one portion of the class each time. Evaluate via a simple check, plus, minus-type system, and encourage students to come to office hours if they have questions.
- Focus each short writing assignment very carefully on developing a particular skill such as summarizing a reading, defending a claim, or citing a source.
- Make your expectations clear for each writing assignment.
- Many participants agreed that meaningful interaction need not be directly with the instructor. Ask pairs or triads to discuss a question or problem for several minutes and then field comments from various groups.
- Require groups to give formal, in-class oral presentations tied to significant out-of-class projects. At least one participant finds this particularly effective at generating discussion when each group works on only one piece of the puzzle or has only part of the data.

2. How can I develop students' information gathering skills?

- Assign problems that can be solved only by using specific electronic or print resources. Give well-contained problems at first, and as students become more comfortable finding the answers, increase the challenge. For example, initial problems may direct students to a particular Web site link (an on-line newspaper or periodical) or a given software package, while more advanced problems may require some searching on LIAS or on the Web, with a range of suggested resources given as starting points.
- Assign group or individual field research--e.g., "Find an on-campus example of a kind of tree / architectural style/etc." Make it fun for students, and help them find resources readily at hand.

3. How can I encourage international/intercultural competence?

- Give students a variety of reading assignments and/or content-related examples (local, state, national, and international) whenever possible. For example, if you teach art appreciation, consider including more non-Western artists than textbooks or previous syllabi do.
- Help students see the relevance of what they're learning. For example, if one of your labs is relevant to a community issue or enterprise, bring in an article from a local paper and ask students to analyze it from various perspectives: scientific, ethical, socio-economic.

4. How can I incorporate active and collaborative learning in a large class?

- Create small ad hoc groups (or pairs) that work in class on a focused question, problem, or exercise; this gives students an opportunity to interact and really engage the material, and it also gives them a needed lecture break. Those with recitation sections sometimes assign the group problems there, and then hear reports in the lecture. Another variation is to have group members role play various positions as they debate a given claim or issue.
- Invite student groups or partners to present the assigned reading and lead the class in discussion (they can use questions you provide as a start). Although only a small fraction of the class gets to present, many more are willing to participate when their peers take the lead.
- Administer some kind of understanding check at the end of class to get feedback. The most popular example is the "minute paper," which usually consists of two questions: "What was the most important thing you learned in today's session?" and "What did you find most confusing or unclear?" An interesting variation is to give a "minute problem" that requires students to apply some key concept that has just been covered. A portion or all of these are collected, read, and used to plan the next session.
- Ask students to supply information (facts, data, examples, etc.) for in-class problem-solving. Whenever possible, ask for information directly related to students-eating habits, study habits, demographics of any sort. This increases enthusiasm and participation.
- Conduct demonstrations that involve all or a subset of your students. For example, Gita Sathianathan (Chemistry) passes a lead brick and a plastic brick of the same dimensions around the classroom during the first part of her lecture and then asks students for a comparison to introduce the concept of density. Peter Maserick (Mathematics) uses a Java applet showing triangles that make up a hexagon. He asks students to tell him the value of pi to two, three, four, five, etc. decimal places. As he enters each response, the hexagon increasingly resembles a real circle.
- Find easy ways to acknowledge/reward those who participate in class. For example, pass coded index cards to those who ask or answer a question; the student signs and turns in the card to get credit. Some participants post participation questions to their course Web site before class and give bonus points to those who answer correctly in lecture.

- Case studies: Rather than using case studies of the Harvard Business School variety, many teachers employ such things as video scenarios, brief narratives, students' own experiences, newspaper articles, mechanical design snags, graphs, and even data sets to help students apply difficult concepts to real-world problems. For example, a single case can be used in conjunction with a related data set to show that while the data may support a particular theory, that theory may be difficult to apply in the single instance.
- A number of instructors are assigning problems related to data provided by current students on the first day of class. This gives students the opportunity to analyze data provided by their own cohort and to design data collection forms for the same group. Laura Simon (Statistics) has generously provided URLs so that you can take a look at two such forms, the first designed by her and the second by her students:
<http://www.stat.psu.edu/~lsimon/webforms/forms/instr250.html> and
<http://www.stat.psu.edu/~lsimon/webforms/forms/instr250b.html>
- For case studies or any other group problem-solving activity to be successful, students must be prepared for the activity ahead of time and must understand how to tie it back to course objectives once they've completed it. For example, one faculty member gives an individual writing assignment prior to asking students to work in groups on a related problem so that the transition to group activities is gradual. Another gives a "prepare quiz" to make sure students understand the goals and procedures for the upcoming group project. Some of the integration of group problem-solving and course objectives can be done on a course Web page and through discussion via a class list.