Teaching and Learning in Large Classes

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Teaching and Learning in Large Classes

Abstract
There are several crucial questions one might wish to ask about large classes. The first is: "Should we be teaching large classes at ISU?" This is an important question because it involves time and resource issues, as well as issues related to student engagement and learning. I'm not going to address this question - it's a question for those "higher up on the food chain" than I. The second question is: "Do we teach large classes here at ISU?" The answer to that question is, of course, a resounding "yes," That leads to a much more difficult question to answer, and the one that I actually wish to address in this article.

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There are several crucial questions one might wish to ask about large classes. The first is: “Should we be teaching large classes at ISU?” This is an important question because it involves time and resource issues, as well as issues related to student engagement and learning. I’m not going to address this question — it’s a question for those “higher up on the food chain” than I. The second question is: “Do we teach large classes here at ISU?” The answer to that question is, of course, a resounding “yes.” That leads to a much more difficult question to answer, and the one that I actually wish to address in this article. Given that we DO teach large classes (and are likely to for the foreseeable future), how can we increase student engagement and learning in such circumstances?

Teaching large classes effectively certainly involves having a clear and useful syllabus, well-organized lectures, engaging presentations, fair tests, and reasonable assignments. I would argue, however, that even if each of us who is teaching classes of over 50 students was doing all of those things well, there would still be plenty of room for improvement in maximizing student learning in large class settings. Cooper and Robinson (2000), reporting on the work of McKeachie (1986), reported that although “lectures and discussion methods are equally effective in fostering memorization of lower-level factual material, the lecture method is less effective when measures of long-term knowledge retention, transfer of knowledge to new situations, measures of higher-order thinking, attitude change,
Some strategies to increase student engagement with course material in large classes

I routinely use the following strategies in the large classes (Biology 201 and 202, approximately 200 students each) that I teach. It is my perception that each of these procedures has a dual benefit for students. First, the students are more engaged in selected aspects of the subject matter because they are discussing ideas or generating questions, rather than simply listening to me lecture. Second, each of these strategies provides opportunities to take a break from lecture, thereby allowing the students to reset their “time-on-task” clocks. Various studies (e.g., Penner, 1984, Verner and Dickson, 1967), report that student attention is high for only the first ten to twenty minutes of a lecture and then drops until near the end of the lecture. Student note-taking thoroughness is also reported to decrease over the course of a lecture (Gardiner, 1994).

One very simple strategy is to poll students by asking them questions in class and collecting their responses for review and later use in class. For example, when I start the plant biology section of Biology 202, I ask the students to write down, and hand in, one question they have about how plants function, and why they think plants are “boring.” I use selected questions to introduce various topics in later lectures, and I select my favorite reasons for “why plants are boring,” which I then share with the students as a lecture break during a subsequent class. There are always some very clever (and funny) reasons.

Another approach is to give group quizzes as breaks from lecture. I structure these by selecting a topic from a recent class and giving the students a few minutes to form groups and quickly review their notes on that topic. I then give the quiz, allowing the students to continue to work as a group, but without their notes. The immediate motivation of having some points at stake leads to active and animated discussion. Note Taking Pairs (an idea promoted by Project LEA/RNTM) can also provide effective lecture breaks. This approach involves allowing the students to form pairs and compare a portion of their notes to identify key points. I then ask for volunteers to share their group’s key points. I have found small candy bars to be quite effective in increasing the number of volunteers.

The availability of easy-to-use Web-based course management tools (e.g., ClassNet or WebCT) provides additional opportunities to engage students. One approach that I use is to give students the assignment of posting questions that are related to the course material.

The advantage of using the Web is that all students in the class have the opportunity to see the questions asked by their classmates, as well as to read my answers. I then select student questions for use as review material at the beginning of subsequent classes or as lecture breaks. A more involved Web-based approach is to choose a controversial topic and ask the students to form groups and discuss the topic during class. Such an activity can be useful in itself, but the students in one group do not know what aspects of the topic were discussed by other groups in the class. Therefore, to earn the points for participating in these discussions, I require the students to draft a summary of their discussion and to post that summary on the Web. Individual students can then earn additional points by responding to the summaries posted by other groups. I have found that students are much more likely to present, and defend, opposing views on the Web, than they are in the actual large class setting.

If you would like to see an example of how these types of activities might work, feel free to log onto my course Web page for this semester. Simply go to ClassNet (link on the ISU Home Page) and select the course Bio 202 Colbert S-01. You can then log in using the
e-mail address visitor@iastate.edu, password: visitor. Click on the “Discuss” button to view student questions and discussion summaries.

I encourage you to accept the challenge of carefully considering where it would be appropriate to incorporate non-lecture components that may increase student engagement and learning in your large class. We’ll never be perfect at maximizing student learning in large classes (of course, the same could be said of small classes), but that doesn’t mean we should stop trying.

References:


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**Master Teachers Share Their Expertise - You Are Invited!**

The LAS Master Teachers for the 2000/2001 academic year will present a series of workshops to share the techniques they have developed to improve student learning. These workshops are sponsored by the Instructional Technology Center and the CTE. Please take advantage of this informative series.

**David Stuart, Music**

“Using Technology in Performance-based Presentations,” February 28, 12:00 – 1:30, Martha Ellen Tye Music Recital Hall.

This workshop focuses on the use of technology in the context of a performance-based presentation that may be used interactively with students. Featured technology includes state-of-the-art surround sound, body microphone, and video projection. Dr. Stuart will demonstrate video and audio techniques and their integration in PowerPoint presentations.

**Tom Ingebritsen, Zoology and Genetics**

“How to Teach a Course on the Internet – Project BIO Model” March 5, 3:00 – 4:30, ITC Classroom (1230 Communications Building)

Topics addressed in this workshop include instructional design; using streaming media and interactive, on-line animations to help students visualize biological structures and key concepts; generating student excitement for the subject by developing student activities involving access to authentic research databases; using problem-based learning in an on-line course; automated, on-line self-assessment and on-line testing. Dr. Ingebritsen will also discuss evaluation of the Project BIO on-line courses and authoring streaming media content.

**Doug Yarger, Geological and Atmospheric Sciences**

“Using Technology to Create Learning Environments” March 22, 3:30 – 5:00, VRAC Aud., 1140 Howe Hall

This workshop features a discussion and demonstration of the use of computer and web-based technologies to engage students in “learning-by-doing” activities. Topics to be discussed and demonstrated include pedagogic considerations, virtual reality applications (a tornadic storm), Java-based simulations (to make a cloud and other items), animations (demonstrating how a cloud system can become tornadic), authentic problem solving activities (weather prediction), and course management (how to engage and track 300+ students). The VRAC auditorium in Howe hall will be used as a portal to emerging education tools.

**Rebecca Burnett, English**

“Formative Feedback via Technology” March 28, 3:30 – 5:00, ITC Classroom

Would you like the time you spend assessing and evaluating student writing to be more productive? Given your time and effort, would you like increased student response

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