

Teaching Large Classes

Classes with large numbers of students present special challenges, especially in terms of logistics, work load, keeping students interested, and maintaining class decorum. This article provides tips for all these items except the last. A separate article deals with class decorum, but often by keeping students interested, class decorum takes care of itself.

Logistics Tips

Make a wait list policy. UNB does not have a university-wide policy on wait lists, so check with your department to see if they do. UNB allows students until the second Friday after the start of the term to decide whether they will drop a course

(<http://www.unb.ca/academics/calendar/undergraduate/current/regulations/universitywideacademicregulations/i-generalcourseeregulation/index.html>). Consider limiting wait lists to a percentage of class enrollment that works for you. You could try clearing the wait list at the end of the first week of classes, emailing students who didn't attend to see if they plan to drop the course. You could specify in your course syllabus that your attendance policy assumes that failure to attend the first two classes will be taken as an indication that students will be dropping the course. Keep in mind, however, that students do actually have until the second Friday from the start of the term to decide. However, such a stated course policy may reduce the amount of time you will have to devote to the matter because of students who dither for a week or two about whether to stay in the course.

Make a policy for student announcements. You may decide to prohibit any student announcements in class. Or, your policy could be one or more of the following:

- **In-class announcements:** Restricted to one minute, with a maximum of two announcements per. Have students email you the proposed announcements beforehand for clearance. Announcements must be directly related to course content.
- **Announcements by course e-mail:** Handle through your E-Services class list, and have students email you the announcement to send to everyone, and make it known that you may edit proposed announcements for clarity, length, and relevance. You could also set a limit of two or three a week.
- **Handle all announcements through Desire2Learn (D2L):** only instructors can post class announcements in D2L, so students can email them to you and you can either send them as D2L course email or post as course announcements. Note that students can send course-wide emails on their own in D2L, so you should state a policy that restricts this in your syllabus if this capability is a problem for you.
- **Leafleting:** Options include student distribution of flyers outside the classroom door as students enter, but they may not inside, nor may they be distributed by putting them on classroom seats.

Start and end classes on time. Students respond well to the predictability and the respect for them that this implies.

Avoid giving cues that class is ending. Prevent students from packing up and leaving early by restating the three most important concepts or points of the day. Avoid statements like, “One more point and then we can go” because students may take that as a cue to go.

Workload Tips

Do a cost-benefit analysis: Decide on the number and type of assignments and tests after analyzing the benefit to students compared to the cost to you in terms of time and effort. Prompt feedback is a major predictor of improved student performance (Cooper 2000-1), and it is critical to expend your scarce marking resources for maximum impact on students.

Consider online homework and assignment submission: If you have homework (problems, readings), decide how you will collect and receive homework and handle the marking volume. If you decide not to mark homework or have quizzes on readings, students may not take them seriously. At a minimum, ensure students have ready access to the answers. Consider handling this through Desire2Learn, in which student can submit assignments and you can post answer sets, or have automatically marked quizzes on readings. You can also use quizzes to collect information on what topics students may need extra in-class help on, especially if you ask this as a quiz question and review the answers in aggregate before class. See <http://www.unb.ca/learningresources/> for more information.

Alternative ways of collecting and returning homework:

- Set up boxes with a homework folder for each student or by letter. To maintain privacy, fold and staple the paper before placing it in the folder or ask students to submit their work with a cover page that has only their name on it. Or, put each assignment in a sealed envelope with the student name on it. For more ideas, see <http://www.unb.ca/secretariat/rtippa/training-resources/grades-assignments.html>.
- Place students’ work in alphabetical stacks (e.g., A–G, H–N). Give each of your teaching assistants a stack and have students go to different parts of the room to receive their work. Or have students line up in alphabetical order and walk past you as you return their work.
- Return homework during office hours.
- Post the correct answers online, but don’t return any homework.

Stagger assignment due dates. Perhaps all 250 students need to submit a paper, but students could write on different topics that are due on different dates. Or, divide the class into ten groups of twenty-five students and have each group’s due date be a different week.

Use D2L multiple-choice tests as an alternative. Marking is automated and you can increase the value of the exercise by making question distracters be common misconceptions and providing question

feedback with useful content. Multiple-choice questions can measure any learning level, from comprehension to analysis and application. The latter levels typically involve questions about a complex scenario or case study. You can also have online short answer and essay type questions that you would review, mark and give feedback for online. The reduction in paperwork will correspondingly reduce the marking load, making the manual online marking of a few questions manageable.

Tips for Keeping Students Interested

See also the related article “How to Lecture Effectively.”

A University of Maryland study (Cooper, 2000-1) showed the following as major sources of student concerns about large class instruction:

- Lack of interaction with faculty members (in and out of class).
- Lack of structure in lectures.
- Lack of or poor quality discussion sections.
- Inadequate contact with teaching assistants.
- Inadequacy of classroom facilities and environment.
- Lack of frequent testing or graded assignments.

Typical lectures seem have the following underlying assumptions, few of which seem accurate: all students have an auditory learning style; all students need the same information presented orally at the same time and pace, without dialogue with the instructor; have high working-memory capacities; have the prerequisite knowledge and discipline to benefit from the lecture; and have good note-taking skills.

Large classes by their nature, where the instructor does not know students by name, set up a distance between instructors and students that should be compensated for, because disconnected students feel little sense of responsibility or accountability in class.

To help connect with students, use your lectures to:

- Organize, integrate, and update reading materials.
- Model problem solving and critical thinking as conducted by an advanced practitioner in the field.
- Demonstrate enthusiasm for the subject matter.
- Relate course-relevant personal experiences to the students.
- Explain and develop complex concepts and ideas introduced in the reading.
- Provide context for issues and ideas and information introduced in the reading.

A 2005 research project (Carpenter) that focused on the questions (1) “What teaching methods are effective in large class environments?” and (2) “What are students' perceptions of these methods?”

found that the teaching methods that were most effective in improving student marks were, from highest to lowest:

1. Lecture and jigsaw (more about this below) discussion method
2. Case study
3. Lecture and discussion

The project findings showed that students preferred, in order:

1. Lecture and discussion
2. Lecture and jigsaw discussion method
3. Case study
4. Team project (outside of class), even though this method did not significantly improve marks according to the study, a fact students may not have known.

Consider beginning the class with a short, multiple-choice quiz on the assigned reading if there was one, or last day's lecture if not. Some instructors ask for students' questions at the beginning of class, list them at the front, and commit to answering them during the class.

After about fifteen minutes, have a "change of pace" activity that requires students to explain their understanding and/or defend it to another student, answer some questions, or otherwise engage with the material or each other. This engages students, then "resets" them for another 15-20 minute lecture attention span. Here are some options:

- **Have students vote.** Project multiple-choice questions at the front for which student responses are observed and form the basis of discussion. Using student response systems or "clickers" to collect responses and display aggregate responses requires students to commit to an answer, which raises their stake in the questions and interest in the outcomes, and gives them an anonymous and face-saving way to participate and learn from their mistakes.
- **Short in-class discussions of the turn-to-your-neighbor variety.** Students are given a question to consider or problem to work through, discuss with a neighbor, and sometimes report back to the class as whole. Students can check their understanding, prepare for the upcoming lecture information, or refocus on material just presented. Teachers and teaching assistants can check student understanding as they circulate around the classroom and listen to these conversations. Such strategies are easy to implement because significant preparation or group coaching time is not necessary, and since nothing is submitted, there is no concern about grading collaborative student work. And, since they take just a few minutes, there is little loss of content coverage, and little risk of loss of control. However, such activities have high impact for little investment because they make conventional lecture formats more engaging and productive for students.
- **Scripted cooperative learning.** Pair students so that teammates vary from one class session to the next. The pairs review class notes, taking turns as recaller-summarizer and checker. The recaller-

summarizes the content of the prior lecture segment and the checker assesses the summarizer's accuracy and detail. After agreeing on the accuracy of the notes, students jointly work on developing strategies that will help them remember the content, such as creating examples and developing mnemonic or memory devices.

- **Peer instruction:** this is a more formalized variation of the previous “turn-to-your-neighbour” activity. At a logical lecturing juncture after 15-20 minutes, present a question that tests understanding of the concept and have students respond anonymously with clickers. It is critical that the question is a significant one on a key part of the concept, and that the distracters in the answer options are common misconceptions about the topic. If the answer pattern is (1) that 70% or more students select the correct answer, then you can move on to the next topic. If the pattern is (2) scattered (e.g., less than 50% for the correct answer but no particular preference for one of the common misconception distracters), then you need to lecture some more on the topic. However, if at least 50% have selected the correct answer and there is a strong preference for one of the distracters (3), then ask students to justify their selection to their neighbour. By having a stake in the outcome and grappling with their understanding of a topic in their own words in the face of differing opinions, student “process” the concept to a deep level (such as application) in short term memory for better retrieval and use later from long-term memory. See <https://www.youtube.com/watch?v=FUY049rljdM> for much more detail on Mazur's peer instruction method.
- **Jigsaw:** In groups of three to five, have each student focus on a different part of a concept, creating and rehearsing an explanation. Each group has the same task. Then, have each student, in turn, present and defend their explanation to the other group members. An effective way to learn material at a deep level is to teach it to others. Many students learn best from other students, who can explain new information using language more understandable and less academic than an instructor.
- **Think-pair-share:** Pose a question, test item, or issue for students to consider briefly individually (the think phase). Then, have students turn to others sitting nearby and share their responses with another person (the pair phase). For the share phase, have several of the pairs share their responses with the class. Using think-pair-share not only involves higher-order thinking and provides immediate feedback to both students and instructors on the degree and quality of student understanding.
- **Think-pair-square:** Have the above pairs of students share their information within teams of four rather than with the class. This makes more efficient use of class time and engages more students in active learning conversation.
- **Quick-thinks:**
 - **Reorder the steps:** Ask students to correctly order a set of randomly sequenced steps.
 - **Paraphrase the idea:** Ask students to explain something in their own words, often for a specific audience, such as another student, a parent, or a hypothetical client. This

requires cognitive elaboration skills as students explain the idea to others, a skill strongly related to deep learning.

- **Correct the error:** Ask students to find the error in an inaccurate statement, a weak argument, or an illogical conclusion.
- **Support a statement:** Ask students to support a statement made by the instructor, drawing on what they have learned from a variety of sources, which might include lecture notes, homework assignments, library research or life experience.

Most of the above strategies provide opportunities for students to demonstrate an understanding or practice a skill and receive immediate feedback from other students, teaching assistants, or instructors, and the feedback provided helps students determine their specific strengths and weaknesses.

Take these strategies one step further to a model-practice-feedback loop, and you will be providing one of the most powerful instructional strategies available. This procedure starts with the instructor modelling the technique, skill, or concept to be taught. Students are then given several opportunities to practice the skill or apply the concept. Finally, students receive prompt and descriptive feedback on the quality of their performances.

Students don't do these kinds of things naturally:

"I got started with discussion pairs in chemistry about ten years ago when I took over teaching the big introductory classes of several hundred students. I got started gradually by working a problem with the students and then giving the students one to work on themselves together with their neighbors sitting next to them. Now these activities underpin every class I teach. What propelled me into this was watching colleagues in lecture working a problem on the board: I saw it going into the students' eyes, down their arms and into their notebooks, but their *understanding* of the problem was bypassing their brains! Over and over, I saw the students not be able to do similar problems in the tutorial the very next day." (Helen Place, personal interview with the Cooper, 2000, 2)

"You have to train your students to do this; they don't come by it naturally. You have to be patient. Students do not collaborate naturally. They have been taught to compete, and not work together. . . . When I explain what I am doing with the class, I make an analogy to any sport. I tell the class that I can solve these chemistry problems and they can't—yet. The only way they can learn to do it is to do it for themselves. I say to them, "I am making you practice, just like practicing for football." This is directed, coaching practice, which, after a while, leads to competence. . . . It usually takes me about half the semester before students really get into the rhythm of working problems with their neighbors in class. Those that go on to the second-semester chemistry classes are all ready to go, of course." (personal interview with Cooper, 2000, 2)

Concept maps and flow charts: Concept or knowledge maps are two-dimensional visual representations of important concepts. They illustrate the overall structure of lecture content, using visual images of key topics and ideas and use lines and arrows to indicate key relationships among them. You can provide these, or you can work with students during class to create them, or students can create them and share them with each other or the entire class.

A minute paper. This involves having students answer two questions in the last one to three minutes of class. Typical questions are, “What was the most important thing you learned during this class?” and, “What issue or concept remains unclear, or raises questions for you?” They don’t need to be signed but should be collected and quickly reviewed before the next class. They are a source of valuable information, including the quality of students understanding of concepts, indicators of topics that need further instruction, and a sense of the effectiveness of your teaching methods. They can also be the basis for a think-pair-share activity at the end of class to identify what was clear or unclear about the lecture.

Collect student suggestions: Provide students a non-disruptive outlet for expressing their concerns. An “exit” box at the back of the room for students’ questions, ideas, suggestions, and concerns is such a provision. Be sure to collect them regularly and tell students what you have done when you respond to them. An anonymous online drop box or survey in Desire2Learn can serve the same purpose.

Small group work in large classes is useful for:

Initiating class discussion. Small-group work at the beginning of class can provide students with a motivation “hook” or an anticipatory setting for what is to follow in the lecture.

Breaking up the lecture for comprehension checks and deeper learning. “Think of two real-world examples.”

Closing class with small-group conversation. You can reduce the number of minute papers they have to check by asking students to create them in pairs or teams.

Reviewing for/debriefing after Exams.

Deepening audiovisual presentations. Slide presentations are ubiquitous features of lectures, and having students speculate on what is coming up can serve as an attention resetting device. For example, have students use information already provided to anticipate it’s summary depiction in an upcoming slide.

Predicting processes and outcomes of demonstrations. This helps because students commit to an answer and are more invested in the outcome.

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