

Preparing to Teach the Large Lecture Course

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A sizable portion of the work involved in teaching a large lecture course takes place well before the first day of classes. For example, in a seminar you can make a spur-of-the-moment assignment, but in large classes you may need to distribute written guidelines. Similarly, in small classes students can easily turn in their homework during class. In large lectures you must decide how to distribute and collect papers without consuming precious class time. All these tasks take planning and organization. Many of the following suggestions for teaching large classes will also work for small classes: good teaching practices apply to classes of any type.

General Strategies

Become comfortable with the material. In an introductory survey course you may be covering topics outside your specialty area. Read up on those topics and try to anticipate questions that beginning students might ask. Review the course materials, assignments, and reading lists of colleagues who have taught the course before. Consider sitting in on courses taught by colleagues who are especially effective teachers of large classes to see what ideas and techniques work well, or ask them about their experiences teaching the course.

Don't plan to lecture for a full period. The average student's attention span is between ten and twenty minutes (Penner, 1984). After that, students have difficulty concentrating on the speaker. For each lecture, plan to change the pace every fifteen minutes or so to relieve the monotony and recapture students' interest. For example: ask students to solve a problem at their seats or in groups of two or three, give a demonstration, use an audiovisual aid, or tell a story or anecdote.

Be clear about what can reasonably be accomplished by lecturing. Research shows that lecturing is as effective as other instructional methods,

such as discussion, in transmitting information but less effective in promoting independent thought or developing students' thinking skills (Bligh, 1971). In addition to presenting facts, try to share complex intellectual analyses, synthesize several ideas, clarify controversial issues, or compare and contrast different points of view.

Budget your own time carefully. Teaching a large lecture class takes a great deal of time and energy. Set up weekly work schedules for yourself so that you are prepared for the onslaught of midterms and finals. Find ways to scale back other obligations, if you can, so that you have time to deal with the complexities of teaching such courses.

Organizing the Course

Decide what content to cover. After reviewing your department's guidelines or sample curricula, set your broad goals for the course. The goals of an introductory survey course might include stimulating students' interest in the field and providing them with sufficient foundation to pursue that interest. Next, make a list of topics you feel are important to include. Estimate the amount of time required to address these topics, and then increase your estimate by 50 percent to allow time for entertaining questions from students and for the inevitable slippage in large groups (Christensen, 1988). For suggestions on how to reduce the number of topics to fit the length of the course, see "Preparing or Revising a Course."

Organize the topics in a meaningful sequence. Lurching from one topic to another makes it difficult for students to assimilate and retain the material (Dubrow and Wilkinson, 1984). Arrange the course topics thematically, chronologically, spatially, in ascending or descending order, by cause and effect or problem and solution, or according to some other conceptual rationale. Here are some examples of course organizational patterns:

- *Topical:* A psychology course examines how four groups of theorists approach human behavior: social learning theorists, developmental theorists, psychoanalytic theorists, and cognitive theorists.
- *Causal:* An economics course explores various factors that affect the distribution of wealth: the labor market, tax policy, investment policy, and social mobility.
- *Sequential:* A course on education in the United States covers the school system from preschool to elementary school, secondary school, college, and graduate school.

- *Symbolic or graphic*: An integrative biologist begins each lecture by projecting the same transparency of a diagram of the human brain. Using a plastic overlay, she then draws in those structural details relevant to that day's lecture.
- *Structural*: A physiologist discusses anatomical systems in the same consistent format: the organs, the functions of the organs, how the organs are regulated, the relationship of the system to other systems, and so on.
- *Problem-solution*: An engineering course looks at a series of structural failures in various types of buildings.

Make the course structure explicitly known to students throughout the term. Describe the organizational structure in the syllabus, at the beginning of the course, and throughout the term. Periodically devote a part of the lecture to the broader view.

Vary the types of lectures you deliver. Choose formats that suit the content (adapted from Frederick, 1986, pp. 45–47):

- The *expository lecture* is the traditional lecture that treats a single question or problem, typically with a hierarchical organization of major and minor points. This approach allows you to present broad concepts and factual information efficiently but runs the risk of reducing students to passive spectators.
- The *interactive lecture* evolves around orderly brainstorming in which students generate ideas in response to a question or prompt (“Call out what you know about DNA”). The instructor and the class then sort the responses into categories. The flow of examples and counterexamples, generalizations and specifics, or rules and exceptions encourages students to grapple actively with the topic.
- *Problem solving, demonstrations, proofs, and stories* begin with the instructor posing a question, paradox, or enigma—some provocative problem that whets students’ interest: “What would happen if . . . ?” The suspenseful answer unfolds during the class period, with students actively or passively anticipating or pointing toward solutions.
- The *case study method* follows a realistic situation step by step to illustrate a general principle or problem-solving strategy. Depending on the level of the students, either the instructor takes the lead or the students themselves generate the questions and principles.
- *Short lectures framing discussion periods* allow an instructor to shift the energy to students. The instructor begins with a twenty-minute lecture

setting the stage for some issue, then opens up a fifteen-minute discussion of implications and effects, and closes with another short lecture that pulls together the major themes or issues. In large classes, the discussion segment may be turned over to students working in trios or small groups.

(Sources: Bligh, 1971; Brown, 1978; Brown and Atkins, 1988; Frederick, 1986; Lowman, 1984; Penner, 1984)

Consider the abilities and interests of your students. In preparing your course, ask yourself How much will the class know about the subject matter? How interested will they be in the material? What experiences or attitudes might students have that I can use to draw them into the subject?

Prepare a detailed syllabus for students. The more information you give in writing, the fewer problems you will have later on. During the term, try to stick to the course schedule. If you must deviate, make it clear when and why you are departing from the schedule.

Meet with your graduate student instructors before the term begins. Discuss course procedures, their responsibilities, grading, and the most effective ways for them to conduct sections. See "Guiding, Training, and Supervising Graduate Student Instructors."

Visit the classroom before the first meeting. Notice the instructor's area, placement of light switches, chalkboards, and other details. Make arrangements for whatever instructional equipment you will need: overhead projector, microphone, slide projector. When you visit the classroom, stand where you will lecture, practice using the equipment, and write on the board. Check whether your board work can be seen from the back of the room. (Source: Johnson, 1988)

Preparing Lecture Notes

Carefully prepare your lectures. Thorough preparation can prevent last-minute headaches. You need time to arrange your points, develop your examples, write out definitions, solve equations, and so on. Some faculty prepare their lectures well in advance and revise them during the term to take into account students' reactions to previous lectures. Other faculty believe that the best time to prepare a lecture is immediately after class, when the experience of what worked and what didn't is still fresh (Eble, 1988). New faculty typically complete the bulk of preparatory reading before the course

starts and then keep about one or two weeks ahead of their students (Dubrow and Wilkinson, 1984).

Avoid lecturing verbatim from a script. If you simply read from a prepared text, you will find yourself disengaged from the material (you won't be thinking about what you are saying) and your students will feel disengaged as well (Day, 1980). Moreover, reading prevents you from maintaining eye contact with students, and it casts your voice down toward your notes instead of up and out toward the lecture hall. Writing out lectures is also extremely time-consuming. If you do feel the need to write out your lectures, reduce the completed text to a brief outline of key words and phrases. Lecture from this outline—you will naturally produce sentences more for the ear than for the eye, thereby making it easier for students to grasp the material. See “Delivering a Lecture.”

Experiment with different formats for your lecture notes. Some formats are more suited to certain subjects and disciplines than others (adapted from Day, 1980, pp. 101–104).

- An *outline* is especially useful in organizing a talk and providing an overview of the general structure of subordinate points and transitions.
- A list of *major points* is closer to extemporaneous speech than a detailed outline; this format is appropriate for a speaker who knows the material well.
- A *tree diagram* (such as a flowchart or network) provides a system of pathways through important points with optional stopovers, tangents, useful illustrations, or examples.

Honjo (1989) describes one faculty member in engineering who blocks out a single sheet of paper for each session. He reserves the uppermost left-hand block for the outline of the day's lecture (this outline is also placed on the board). The remaining blocks each correspond to a panel of the board, enabling him to visualize how the board will look as he works through all the examples.

Prepare your notes to aid your delivery. If you are writing an outline of key words or phrases, 5" × 8" index cards are easier to use than smaller cards or sheets of paper. Color code your notes to highlight difficult points, distinctions between major examples, and important information. Include notations that indicate times to pause, ask questions, raise your voice, and so on. Write in the margin, “Put this on the board” or “Have students jot down a

response at their seats” or “If less than ten minutes left at this point, skip to card 7.” Examples boxed in red could mean “Include this if students seem uncertain about my point.”

Write down facts and formulas for easy reference. Within the body of your lecture notes or on a separate sheet of paper, copy out all the key facts, quotations, computations, or complex analyses.

Write down vivid examples. Clear, straightforward, memorable examples reinforce the points you are trying to make. Experienced faculty recommend that you give special attention to preparing examples, illustrations, and demonstrations—more than you might need, to be able to respond to students’ confusions or questions (Erickson and Strommer, 1991). Research shows that an important characteristic of an effective teacher is the ability to take difficult concepts and transform them in ways that students can understand, through the use of metaphors, analogies, and examples (Shulman, 1987). See “Explaining Clearly.”

Prepare your lecture for the ear, not the eye. Oral presentations are very different from written presentations. When students are listening to you speak, they cannot go back and “reread” a troublesome sentence or look up a difficult word in the dictionary. Use these techniques to facilitate oral comprehension:

- Use short, simple words and informal diction, including personal pronouns and contractions.
- Speak succinctly, in short, straightforward sentences.
- Offer signposts for transitions and structure—“the third objection,” “let’s look at this argument from another angle,” “in contrast,” “as we have seen,” “now we can turn to . . .”
- Restate and periodically summarize key points.

To prevent students from sinking into passive listening, also engage students’ active listening skills by interspersing questions throughout your lecture.

Rehearse your lecture. A run-through will give you a sense of how comfortable you are with the material and the length of your presentation. To save time, practice only the most difficult sections, the opening and the ending.

Structuring a Lecture

Structure the lecture to suit your audience and the subject matter.

Consider the difficulty of the material and students' level of ability as you make decisions about the amount of information to cover, the amount of detail, and the number of examples you present.

Begin by writing out the main theme and why students should learn about it. Identify what you most want your students to remember about the topic. It is better to teach two or three major points well than to inundate students with information they are unlikely to remember. Brown and Atkins (1988, pp. 36–39) recommend the following process for writing a lecture:

- Specify the main topic or topics.
- Free associate words, facts, ideas, and questions as they come to you.
- State a working title or a general question based on the groupings from your free association.
- Prepare a one-page sketch of the lecture.
- Read selectively, as needed, and jot down notes on important ideas and organizational structure.
- Structure the lecture in outline form and flesh it out with examples and illustrations; identify your key points.
- Check the opening and ending.

Provide a logical progression for the material. Some lectures lend themselves to a chronological or sequential approach. At other times, you can move from the general principle to specific instances, build up from the parts to the whole, trace one idea across time or space, describe a problem and then illustrate its solution, or announce your thesis and then step back to provide evidence for your argument.

Structure your lectures to help students retain the most important material. Research shows that students' retention is greatest at the beginning of a fifty-minute class, decreases to low levels as the period wears on, and then increases slightly in anticipation of the end (Ericksen, 1978). Plan your classes so that the main points come at a time when students are most attentive. Structure them to include these elements:

- Attention-getting introduction
- Brief overview of main points to be covered
- Quick statement of background or context

- Detailed explanation of no more than three major points, the most important first, with a change of pace every ten or fifteen minutes
- Concluding summary of main points to reinforce key themes

Design your lectures in ten- or fifteen-minute blocks. Each block should cover a single point with examples and end with a brief summary and transition to the next section. If you find yourself running out of time, cut an entire block or shorten the middle section of a block rather than rush the summary.

Budget time for questions. Whether or not you formally open the floor for questions, leave time for students to ask you to repeat material or to supply additional explanations. Some faculty ask for students' questions at the beginning of class and list these on the board to be answered during the hour.

Begin and end with a summary statement. Continuity and closure are important: students need to see how each new topic relates to what they have already learned as well as to what they will be learning in the coming weeks. To bring your points home, use different words and examples in your opening and closing summaries.

Managing a Large Lecture Course

Establish reasonable rules for student behavior. Instructors in large classes usually find it helpful to announce policies about latecomers, eating and talking during class, and other disruptive behavior. Explain your rules early on and stress the value of cooperation and consideration. For example, some faculty set limits on when students can pack up and leave: "You're mine until 2 P.M." or "When the cartoon appears on the overhead you can go" or "After the class has posed three good questions about the material, students can leave" (Hilsen, 1988). Let students know that you expect them to arrive promptly but use the first couple of minutes to discuss a related issue, to take account of stragglers. For example, a geography faculty member discusses the nation's weather. Shea (1990) describes a faculty member in political science who begins class with discussion of a relevant news item.

Plan how to grade and return homework. If homework is an essential part of your course and you do not have a graduate student instructor, grade samples of homework assignments to save time. For the assignments you do not grade, distribute an answer sheet so students can assess their own performance. If you have graduate student instructors, have students turn in

and receive their homework in section. Otherwise, collect homework in a locked box in the department office. Distribute homework in alphabetical folders in boxes on the side of the lecture hall. Call out one or two letters at a time and let the people whose last names begin with those letters go get their papers. Or label a set of manila envelopes with row numbers, and ask students to choose a row for the term and to sit in that row when taking exams, turning in homework, and picking up homework (Chism, 1989).

Stagger due dates for essay or research papers. One faculty member requires all three hundred of his students to write one paper during the semester, but students write on different topics and the papers are due on different dates. At the beginning of the term, he randomly divides the class into, say, ten groups of thirty students each. He announces the dates when the various groups are to turn in their papers. All students receive their paper topics two weeks before their due date. Using this approach, the instructor is able to read and respond to all three hundred papers but never reads more than thirty or so in any given week (Source: Erickson and Strommer, 1991).

Use multiple-choice tests, if possible. Machine-scored multiple-choice exams can save time and minimize grading errors, but students also need practice in writing and grappling with complex questions. If you can, then, include two or three questions that call for a few paragraphs of explanation or analysis.

Avoid giving makeup exams. Scheduling makeup exams is logistically difficult and time-consuming. Instead, try to give enough exams or quizzes so that students can drop their lowest score. Some faculty give shorter final exams and use the last hour for makeup tests. See "Allaying Students' Anxieties About Tests."

Consider forming a student exam review committee. The committee, made up of four or five elected members of the class, is charged with identifying specific test questions that may have been problematic for the class and with suggesting possible remedies. During the exam, students who so wish anonymously complete a brief comment sheet that they turn in with their exam. Members of the student exam review committee meet after the test has been administered to review the exam and look at students' comment sheets. They then meet with the professor to negotiate possible adjustments. For example, if over half the class felt question 3 was unfair, the committee may suggest tossing it out. The instructor makes the final decision after hearing from the committee. All students in the class are made aware of subsequent adjustments. (Source: Holmgren, 1992)

Consider using computerized record-keeping and communications systems. Software such as BIJOU (Wiseman, 1986) can facilitate the storage and retrieval of information related to enrolling students into sections, coordinating the preparation and delivery of materials with staff and office support, and maintaining rosters and grade records.

Sample Lecture Outline

Below is a sample outline (adapted from Scott, 1990, p. 35) for a lecture on DNA.

Opening: While you may be familiar with DNA, did you know that the story surrounding its structure, the double helix, is one of the greatest detective stories of all time?

Thesis: Crick and Watson's discovery of the genetic code radically changed our views about all forms of life.

Connection: If you plan to take other science courses, this topic will be invaluable in helping you understand genetics and molecular biology. But even if this is the last science course you will ever take, the DNA in your body will influence your life and life span. The genetic code also holds the key to cures for life-threatening diseases and has ethical ramifications, especially regarding efforts to alter the genes of a human fetus.

Organizers: There are three things I want to discuss.

- a. Double helix
- b. Human genomes
- c. The book of life project

Body: (Elaboration of three topics with opportunities for small group work during the session)

Summary: (Brief recap about each of the three topics and why the discoveries are so important)

Closing: Let me close by posing a question: If you could genetically alter a vegetable or piece of fruit, what would you change and why?

References

Bligh, D. A. *What's the Use of Lecturing?* Devon, England: Teaching Services Centre, University of Exeter, 1971.

- Brown, G. *Lecturing and Explaining*. New York: Methuen, 1978.
- Brown G., and Atkins, M. *Effective Teaching in Higher Education*. London: Methuen, 1988.
- Chism, N.V.N. "Large-Enrollment Classes: Necessary Evil or Not Necessary Evil." *Notes on Teaching*. Columbus: Center for Teaching Excellence, Ohio State University, June 1989, pp. 1–7.
- Christensen, N. "Nuts and Bolts of Running a Lecture Course." In A. L. Deneff, C. D. Goodwin, and E. S. McCrate (eds.), *The Academic Handbook*. Durham, N.C.: Duke University Press, 1988.
- Day, R. S. "Teaching from Notes: Some Cognitive Consequences." In W. J. McKeachie (ed.), *Learning, Cognition, and College Teaching*. New Directions for Teaching and Learning, no. 2. San Francisco: Jossey-Bass, 1980.
- Dubrow, H., and Wilkinson, J. "The Theory and Practice of Lectures." In M. M. Gullette (ed.), *The Art and Craft of Teaching* Cambridge, Mass.: Harvard University Press, 1984.
- Eble, K. E. *The Craft of Teaching*. (2nd ed.) San Francisco: Jossey-Bass, 1988.
- Ericksen, S. C. "The Lecture." *Memo to the Faculty*, no. 60. Ann Arbor: Center for Research on Teaching and Learning, University of Michigan, 1978.
- Erickson, B. L., and Strommer, D. W. *Teaching College Freshmen*. San Francisco: Jossey-Bass, 1991.
- Frederick, P. J. "The Lively Lecture—8 Variations." *College Teaching*, 1986, 34(2), 43–50.
- Hilsen, L. "A Helpful Handout: Establishing and Maintaining a Positive Classroom Climate." In E. C. Wadsworth, L. Hilsen, and M. A. Shea (eds.), *A Handbook for New Practitioners from the Professional and Organizational Development Network in Higher Education*. Stillwater, Okla.: New Forums Press, 1988.
- Holmgren, P. "Avoiding the Exam-Return Question 'Wall'—Working with Your SERC Committee." *Journal of College Science Teaching*, 1992, 20(4), 214–216.
- Honjo, R. T. *Speak of the GSI: A Handbook on Teaching*. Berkeley: Department of Mechanical Engineering, University of California, 1989.
- Johnson, G. R. *Taking Teaching Seriously*. College Station: Center for Teaching Excellence, Texas A&M University, 1988.
- Lowman, J. *Mastering the Techniques of Teaching*. San Francisco: Jossey-Bass, 1984.
- Marincovich, M., and Rusk, L. *Excellence in Teaching Electrical Engineering*. Stanford, Calif.: Center for Teaching and Learning, Stanford University, 1987.

- Penner, J. G. *Why Many College Teachers Cannot Lecture*. Springfield, Ill.: Thomas, 1984.
- Scott, M. D. *Agents of Change: A Primer for Graduate Teaching Assistants*. Chico: College of Communication, California State University, 1990.
- Shea, M. A. *Compendium of Good Ideas on Teaching and Learning*. Boulder: Faculty Teaching Excellence Program, University of Colorado, 1990.
- Shulman, L. S. "Knowledge and Teaching: Foundations of the New Reform." *Harvard Educational Review*, 1987, 57(1), 1-22.
- Wiseman, M. "The BIJOU Teaching Support System." *Perspectives in Computing*, 1986, 6(1), 5-13.