Teaching Large Classes

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Abstract

Budgetary pressures on educational institutions manifest themselves in larger classes at every level. As teachers, we often feel imposed upon when asked to teach these classes and we accept the conventional wisdom that what we do well in small settings cannot be scaled up to larger ones. While this may be true for some teaching styles, it is not for others, and there are ways in which we can continue to be effective as class sizes increase and enjoy ourselves, to boot. In this paper, I examine ways in which we can preserve teaching efficiency as class sizes increase.

Note: While much of what I say in this piece is abstract, you can visit the web site I have for my classes at http://www.damodaran.com.

Teachers at every level, from pre-school to graduate school, are inclined to blame large class sizes for deteriorating teaching quality. If only you would give us fewer students in our classes, they argue, we would do much better. As we hear this lament, it is worth noting that the correlation between class size and teaching quality is tenuous at best, and any correlation that exists can be just as easily attributed to other factors. As the resources that are available for education are scarce, and large classes are here to stay, how can we better adapt to them? In this article, I will begin by first defining a "large" class, since the number of students that makes a class "large" will depend upon the characteristics of the students, the subject being taught and the teaching style of the instructor. I will follow up with a series of propositions about behavior in and out of the classroom that can potentially improve how we deal with more students and larger classes.

What is a large class?

So, how large is a large class? The answer, of course, will vary depending upon what you teach, whom you teach and how you teach. A class of 35 may be pushing the limits of a graduate philosophy class, where class discussion is the norm and students are graded on what they contribute to the classroom discussion, but a class of 500 may not be viewed as unusual in an introductory physics course for undergraduates at a large public university. In general, the size of a large class will depend upon the following factors:

a. Homogeneity of students: The more students have in common, the larger a class can become. As student backgrounds, skills, interests and objectives diverge, class sizes will generally have to shrink to reflect these differences.

b. Subject matter taught: At the risk of casual generalization, quantitative subjects where answers are more black and white can be taught to larger classes than qualitative subjects where every answer may have shades of gray. Calculus, for instance, should be easier to teach to a large class than theology.

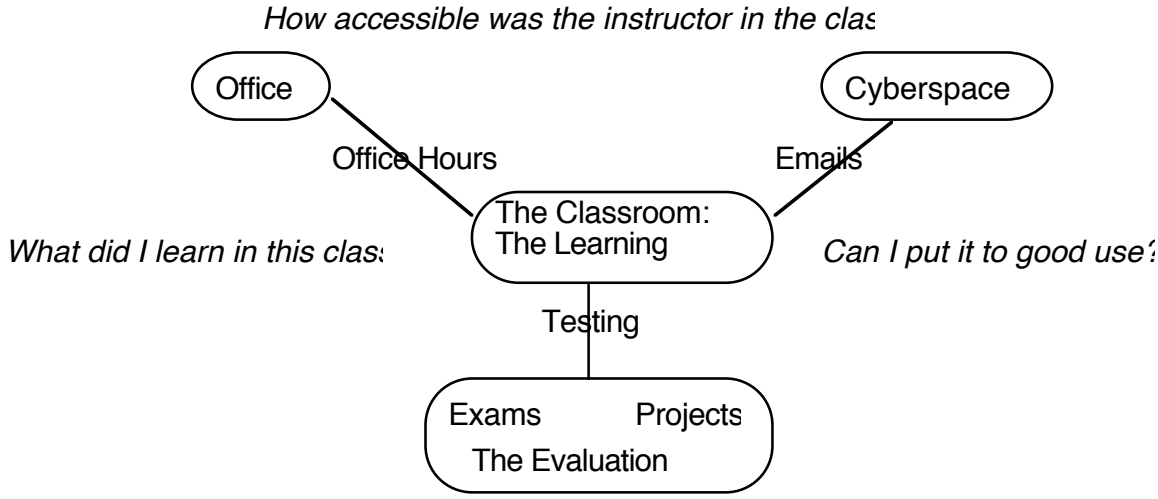
c. Teaching style: Teachers employ different styles, even when teaching the same subject. A lecture-driven teaching style, with relatively little input from the audience, scales up much better than a discussion-driven teaching style. It is much

more difficult to employ a Socratic teaching style, when there are 150 students in the room than when there are only 30.

School administrators should consider all of these factors when determining what an appropriate size for a large class is and should not assume that just because one teacher is successful at teaching a large class, other teachers can also be just as comfortable in such settings.

The elements of teaching

While we often tend to think of teaching in terms of what we do in the classroom, the reality is that much of the groundwork for good teaching occurs outside the classroom, as does much of the learning. In fact, the various aspects of teaching are captured in the figure below:



Listed are three questions that students will assess, when evaluating a class, and they will judge teachers in the process. First, students want the testing to be fair and the grading to reflect what they learn from the class and how much work they put into it. Second, the material that you teach will be examined not only for how interesting it is, but also in terms of how you connect the material to students' lives and aspirations. Finally, students are making judgments on whether you force them to think and keep them engaged in the classroom. You may not be an entertainer, but there is little learning occurring in a classroom where boredom is the dominant emotion.

Testing and Grading

Grades may not matter to you but they do matter to your students. Thus, while you may adhere to the teaching proposition that what you care about is learning and not grades, you should spend some time establishing how you plan to evaluate the students in your class and what system you will follow. If you fail to do so, you will find your time consumed by questions about testing, and learning will take a back seat to grading issues. While there are a variety of ways you can test your students on whether they understand the material (and follow up by assigning grades), here are some common components of grading systems that work in large classroom settings:

a. Clearly stated rules that you adhere to: It is critical that the rules of the game be laid out before a class starts and that you stick with these rules as closely as you can. While you can be flexible and let the rules evolve, when teaching a class of 20, you will quickly find yourself overwhelmed by requests for exceptions if you allow the same flexibility with larger classes. In particular, the following grading features should be made explicit at the start of the class:

- How the class will be tested and graded: If you plan to use a mix of quizzes, exams and projects, specify what the quizzes will cover, when they will be held (unless they are pop quizzes) and how much they will be weighted. If possible, also specify what material students can bring in for the quiz (Is it open book and open notes?) and what types of questions you will be asking.[1]
- The grade distribution that you will be using: Teachers often hate to commit themselves to a pre-specified grade distribution but it is worth considering, especially with a large class. Letting students know up front (in the first class) that only 20% of the class will be getting As and 10% will be failing will not only prepare them for what is coming but also allow them to decide whether they want to stay in the class (and play by your rules). In addition, they will be

[1] I have always made the exams and quizzes I have given in past classes available to the current one. While that does make my job of writing new exams more difficult, it accomplishes two objectives. First, it ensures that students have a clear idea of what a typical quiz or exam is structured – how many and what type of questions are on it. Second, it encourages more preparation. Students are always more likely to work through real exams and quizzes to get ready for the next one than practice problem sets.

able to assess where they stand in the class at regular intervals and make their judgments on how they improve their standing.[2]

- The consequences of missing a quiz or a project deadline: While the decision of what you want to do when someone misses a quiz or a deadline is clearly yours – you may give the culprit a zero or a chance to retake the quiz- it is a good idea to also specify that decision at the beginning of the class. The following is an excerpt from my corporate finance class outline that is both online and provided to students on the first day of class. As you can see, I specify the conditions under which a quiz can be missed and the consequences of missing a quiz.[3]

The Quiz Rules

There will be no amendments, corollaries or other variants of these rules.

1. The quizzes will be on the designated days in the first 30 minutes of the class.
2. The quizzes will be open book, open notes. You can bring in as much supporting material as you can carry.
3. The quizzes are NOT group work. You cannot consult with, talk to or pass telepathic messages with anyone else in or out of the classroom.
4. When time is called on the quiz, please stop writing. It is not fair to others to keep working after others have stopped.
5. Each quiz is worth 10%.
6. If you have to miss a quiz for good reason[4], you will have to let me know (by email) at least 15 minutes before the quiz that you will be missing the quiz.
7. If you miss a quiz for good reason, the 10% weight on that quiz will be reallocated across your remaining exams (quizzes and final). You cannot weight prior quizzes more.

[2] Many schools are imposing grading distributions on their faculty. If you operate in such a system, you are relieved of the responsibility of coming up with your own distribution. I would still restate the school grading guidelines and my intention to adhere to it in the first session.

[3] One reason I always move the points from any missed quizzes to what is left on the class, rather than re-weighting past quizzes, is to prevent game playing. For example, students who have done well on the first two quizzes may be tempted to miss the third quiz in order to get the first two weighted more heavily.

[4] Good reasons for missing quiz: Physical or mental sickness (you, spouse or child), Stalled subway train, Important interview (and you cannot change time).
Not good reasons for missing quiz: Did not have time to prepare, Feeling overwhelmed, Not quite ready.

8. If you take all three quizzes, your worst quiz will be weighted less (No… It will not be thrown out). How much less? That will depend upon how much worse your worst quiz is than your other exams. (In the most extreme scenario, you would get a 0 on your worst quiz and 100% on every other exam. In this case, the worst quiz will have no weight on your grade. If you get a 4/10 (or 40%) on your worst quiz and 90% on all of your other exams, your worst quiz will be weighted only 5% and the remaining 5% will be reallocated across your other quizzes and exam).
9. If you do not take all three quizzes, you will not have the option described in (8), even if you miss a quiz for good reason.
10. I grade all of your quizzes. If you have a beef with the grading (and I do make mistakes), please come to me. I do not bite, chew people's heads off or indulge in similar anti-social behavior. I will listen to your points but I may not agree with them.

b. Do not change the way you test students just because you have a larger class: Presumably, you choose particular ways of testing and grading students because you feel that these ways measure learning better. Thus, if you feel that asking open ended, qualitative questions is the best way to assess learning in your subject, you will construct your exams around such questions. All too often, though, as class sizes increase, teachers switch to different ways of testing, not because they like these tests but because of grading ease. Multiple-choice questions, for instance, are a common choice for very large classes since they can be computerized, thus making grading a snap. As a general rule, compromising on testing is never a good idea, since the grades will then not reflect what you want students to learn from the class.

c. Take ownership of your exams: Many instructors use test banks to get questions for quizzes and tests, swayed by the time saved from using pre-written exams instead of writing their own. There is a strong argument to be made for writing your own exams. Not only will this allow you to focus on the concepts that you

think matter the most and have emphasized in class, but it will make your grading of the exams easier.[5]

d. Provide speedy feedback: Feedback matters in almost everything we do, but it matters even more in classrooms, where a class often lasts only a few weeks or months. As class sizes increase, the importance of getting speedy feedback goes up as well. After all, a student in a class of only fifteen or twenty can assess fairly well where he or she stands by keeping tabs or talking to others in the class, but a student in a class of two hundred or more does not have that luxury. Consequently, getting quizzes, papers and exams graded and back to students quickly is even more critical when you have a big class than when you have a small one. Since you have far more grading to do with the former than the latter, this may strike you as impractical but it can be done with a combination of well-written exams and good scheduling.[6]

e. Be fair: It is not a bad grade per se that leaves a student feeling cheated, but the perception that either the way in which you tested or that you graded was not fair. How do you cultivate this perception of fairness? First, tie your testing, be it exams or papers, to what you do in the classroom. Nothing frustrates a student more than taking an exam where he or she is tested on concepts that you did not even touch on or emphasize in class. Second, make it difficult for students to cheat; have multiple versions of the same exam if you have multiple sections and get additional proctors for exams. Finally, be willing to listen to students who believe that they have not been graded fairly., After all, listening to a grievance does not mean that you have to change a grade.

f. Connect with those who do badly early in the process: You are drawn to and want to cater to the students who like your class and are doing well, but the group that you should really pay attention to is the group that is not doing well in the class. Some of these lagging students will blame you for their troubles and others will blame themselves, but they collectively will drag the class down, if they feel that

[5] When I write a question for an exam, I also work through not only the correct solution (as I see it) to this question but as many wrong solutions as I can. If the question is written well, the latter list should no be endless. A badly written or ambiguous question will generate far more possible wrong solutions.

[6] I leave the weeks that I give quizzes relatively open – no outside engagements and committee meetings. It does require that I plan ahead several months.

their causes are hopeless. You need to reach out to the students in this group early in the class and try your best to bring them back into the fold. This may require your or a teaching assistant spending more time with them or even offering focused review sessions at regular intervals but the payoff will be substantial. Some in this group will indeed be able to turn around their performance and will be grateful to you for your efforts and even those who fail to pull this off will not blame you for their failure.

Outside the Classroom

a. Eliminate administrative issues: A significant portion of the time that we spend in class and in office hours is spent answering administrative questions: What is the project? When is it due? What is the page limit? Much of this time can be reclaimed for more productive purposes by being more specific and detailed at the beginning of a class about these and other details.

b. Watch for and deal with repeat questions If you assess how you spend your office hours, I will wager that a large proportion of the time is spent answering the same questions (asked over and over again, but by different students). While this is tedious, there are two devices that you can use to reduce these repeat questions. The first is to go back and fine tune your lectures to remove any ambiguity or uncertainty you may have left behind on individual topics: repeated questions suggest that a large number of students were unclear about something you said. The second is to answer the question explicitly and put the answers up for the entire class to share.[7]

c. Be accessible: Being accessible to your students is important in any class but it is doubly so in a large class, where students are too intimidated to ask questions in class. While having regular office hours is an obvious solution, having an open door policy where students can drop in at other times is an even better policy. My experience suggests that if students know they can find you when they need you

[7] A frequently asked question (FAQ) section of my web site contains every question that I have been asked in my office hours more than 3 times and the answer that I gave to that question. The time saved across semesters is significant.

(which is what an open door policy engenders), they are less likely to look for you in the first place.[8]

d. Use technology: There is a downside to e-mail, but there is also a substantial upside. Not only can you respond to students when you are away from your office, but you can also keep in touch with them, reminding them of coming deadlines and drawing their attention to interesting news stories.[9]

The Classroom Experience

a. Have a big picture for your class: Classes that become laundry lists for topics are difficult to teach, administer and grade. I believe that every well-taught class tells a story that cuts across class sessions and provides a way of linking the topics and subject matter covered by the class. The slide below is the one that I use to begin the first session of my corporate finance class and I use it to explain how the class will be sequenced and to anchor all the subsequent classes.

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[8] This may sound counter intuitive but anxious students will monopolize your office hours, because they worry that this is their only chance to get questions answered.

[9] On average, I send 4-5 emails a week to my class and put the text of all of the emails online so that they can refer back to earlier emails.

b. Focus each class on one or two key questions: While you may be tempted to cover many issues in a single lecture, the reality is that it is difficult for students to hold on to many different lessons at one time. Focusing each lecture on one or at the most, two major issues and questions is one way to ensure that the lecture is well organized and students walk away with a few key points. Sometimes, less is more.

c. Make it relevant: In addition to posing the question that a lecture will revolve around, you should spend some time explaining why answering the question matters. While this may take away from what you feel is more substantive theory or discussion, establishing relevance is a key step in grabbing the attention of your class. To provide an illustration, one of the key questions that you examine in corporate finance is how you measure the risk in an investment. Before I jump into the models for risk and return, I begin by defining risk in the most general terms, note how it is part of every decision that you make as a human being and why it is important to have a model for measuring risk and estimating the expected return.

d. Look for ways to expand and improve participation: We constantly look for ways to improve classroom participation but the challenge becomes more daunting as class sizes increase, for two reasons. First, there is the intimidation factor where students do not want to ask what they think are silly questions in front of a very large audience of their peers. Second, many students in large classes resign themselves to spectator status and watch those who are quicker on their feet or better versed in the topic step in and answer questions. To improve participation, you can try two techniques. One is to call on specific students and help them work toward an answer, though there is a risk that those students may be embarrassed if they are unable to respond. The other is to provide a focused question and multiple possible answers to make every student in the classroom choose an answer before allowing for a discussion. In my class, I have built into my lectures a series of what I call "passive" participation exercises, where students get to participate in discussion without putting themselves at risk. Below is one example:

With each of these questions, I usually require a couple of minutes of silence where each student can consider the choices and make one. Only then do I open the floor for discussion of the choices. The "two-minute" window ensures that everyone gets a chance to ponder the question, and the subsequent discussion brings out the different opinions on the question.

e. Look for multiple ways of explaining key concepts: Even the best explanation of a concept or theory will leave some students confused or mystified. Rather than move on and risk losing those students for the rest of the topic, you should consider two or three other ways of explaining the same concept. Hopefully, one of these alternative explanations will allow the concept to click, thus bringing the confused into the fold.

f. Look for "Aha!" Moments: One of the most rewarding aspects of teaching is what I would call the "Aha!" moment, where people go beyond what you are doing in the classroom and make a connection to a larger phenomenon that they have not understood before or see in a new way now. With large classes, it is more difficult coaxing out these moments, but they will occur and you need to be ready for them.

Conclusion

If teaching is about connecting with your students and making a difference in how they think and perhaps even live, you should welcome the opportunity to have more students rather than less. While much has been made about the administrative headaches and grading burden of having large classes, there is no reason why teaching effectiveness has to decline with class size. It is true that you need to be more organized and structured when you teach a large class, and that you have to prepare far more for your class lectures, but the payoff is also large. If teaching is about creating magic in a classroom, there is no feeling more magical than being in the well of an amphitheater with 400 students hanging on to every word you say, completely connected with you. For that moment at least, you can see why Mick Jagger and Elton John continue to go on concert tours, even though they need neither the money nor the fame, and why Laurence Olivier, for all his fame as a movie actor, kept returning to live theater. As teachers, in a sense, we are actors, and having a large audience is better than having a small one, especially if you can get them to applaud.

Appendix: Ten tasks for more effective teaching

The points emphasized in this chapter can be converted into a series of tasks or steps that can be implemented in any class. In this appendix, we list ten tasks and steps within each task that can help in making teaching more effective. Note that the difficulty associated with putting each task into practice can vary widely across subjects and across classes even within the same subject.

Task 1: The Big Picture for the class you teach…

- Think about the big picture/ first principles that govern the class that you are teaching now. While doing this,
    - Avoid the jargon that is endemic to every discipline
    - Think in terms of the principles that govern how you think through problems in your discipline rather than on tactics or strategy.
    - Put first principles in common sense terms
    - Keep it compact (should fit on a page)
- Test it out by explaining what you are trying to do in your class to someone who does not know anything about your discipline and, better still, does not care.

Task 2: The question of the day is….

For each session in your class, outline the key question or questions that you hope to answer. In doing so, keep in mind that

- Most good lectures revolve around one or two questions
- Framing the question correctly will make it easier for your students to follow the class.
- Your lecture should revolve around answering the question.

Task 3: Make it relevant

For each session in your class, explain why answering the question you will be addressing in that session matters to your students. In coming up with the motivation, remember that the following reasons don't usually work:

- You need to know it because it will be on the exam
- Everyone in my discipline (finance, marketing ..;.) believes that it is important to know this…

- If you cannot find a good reason why students should know the answer to a question, perhaps you should not ask it in the first place…

Task 4: Generalize your discussion

Take each lecture and go through it looking for ways to say things that appeal to those from

- From other countries and cultures
- From other backgrounds (not finance, in my case)
- With other interests and career plans

Task 5: Make it real

For at least one measure, model or proposition in your class, follow it up by having students look at a real company. If possible,

- Let them pick their own companies
- Make it real time
- Work with the companies in class
- If not, use a case…

Task 6: Explain with every day occurrences…

Using a key concept in your discipline, see if you can come up with something from everyday life that brings it home. If you can,

- Make it personal
- Make it funny
- And keep it connected to what you are trying to explain

Try it out on an audience. If it does not work, try modifying it. If it does, remember it and keep fine-tuning it.

Task 7: Create active participation…

Take at least one or two open ended questions that you currently ask in class and see if you can convert them into a multiple choice questions, with each answer representing a feasible answer (albeit with a different assumption needed to get there).

Task 8: Create aha moments!

If you could do it, what part of your class would you want your students to have the aha moment on? How would you go about making it easier from them to get there?

A simple framework for thinking through problems

- No extraneous issues and questions
- No buzz words…
- A non-threatening atmosphere

The more important the proposition, the greater the payoff to letting students get there on their own…

Task 9: Consider your motivation

- Think of what attracted you to your subject matter in the first place (finance, marketing, management, operations, strategy…) and why. Are you conveying this excitement to your students?
- Think of what bothered you the most when you were learning this subject (The dogma… the models… the assumptions..). Are repeating the same mistakes?
- Why are you a teacher?

Task 10: You and technology

- Make a listing of all the technology you use in the classroom and why you use it. Consider what you will do as backup if any aspect of that technology fails during a class.
- Consider which technological innovations make you a better teacher and which ones may get in the way of effective teaching.