

## TEACHING LONGER CLASSES IN QUANTITATIVE SUBJECTS

### Quotes from:

>> [Edward Melnick](#)

>> [Robert Whitelaw](#)

>> [Faculty Attendees](#)

Workshop October 15, 2002  
Stern School of Business  
Stephanie Nickerson facilitated

Sixteen faculty members participated, with Ed Melnick and Robert Whitelaw making prepared remarks.

CITL took these notes; we did not do a transcription from a tape recorder, so there may be errors.

**Edward Melnick - Professor of Statistics.** (Ed sent an email addendum to his comments, which, with his permission, we include here.)

The first year I taught I told students, who were very passive, everything I had told them earlier in the class session was wrong, and their homework was to correct their notes. There were a lot of complaints about my class.

I like to have students take the problem from the very beginning and work through from the approach to the end result. Then, after, I will talk through how the problem could have been handled differently or better. This works best in classes with fewer than 40 students.

I have three main goals in my courses:

1. Teach students some methodology,
2. Connect quantitative material to other areas in the school, highlight how other business disciplines will use it,
3. And, most importantly, teach them how to think quantitatively.

My basic premise is that education is by definition a passive experience and **it is difficult for students to stay engaged for a long period of time**. Given this assumption, my strategy and comments are:

- **Begin with an outline** that presents the main ideas (1 or 2) from the last class, the main ideas for the present class and how they connect to the last lecture, and the plan for the next lecture.
- **Try to make the students as active as possible.** I write on the board because I want the students to record information from class. (I believe PowerPoint is deadly because it feeds into the passivity of the students).
- I **cold call** because I want students to think with me and because I believe **you learn only when you can articulate ideas**. I have a seating chart, and if they blink three times, I call on them, to keep them awake.
- I **encourage students to find holes in weak arguments** (mine or other class members) and after the discussion I summarize the issue, the correct solution, and point out the "obvious" false approaches and where they breakdown.
- I **encourage students to do homework together** by either forming groups and/or distributing the names of all class members with their email addresses. Although homework can be done jointly, **each student must hand-in the solutions to the assignments**. This forces the weakest students at least to write

down the questions and defend their solutions.

- Time management is much more important in a long class. For a three-hour class, I think in three parts: For me, the **first** part of the lecture is dense with material/concepts. The **next** part is used to illustrate the concepts with simple examples and then counter intuitive examples. The **third** part of the class is spent presenting problems to the class for solutions. Sometimes I take volunteers and sometimes I cold call.

Within a couple of meetings I know the talent level of the students and throw questions to the students that will stretch their thinking but not overwhelm them. To the students it appears as cold calls, but to me there is a definite pattern for calling students. In the last part of the class, where the students start to look like wet noodles, I summarize the day's

material and then show how it relates to other courses and the types of problems that can be solved with these concepts. This part of the class is to communicate the big picture and to increase student motivation.

### **Robert Whitelaw - Professor of Finance**

Here's my generic advice:

1. Do what you are comfortable with, but be willing to experiment. I try something once, and if it doesn't fit, I don't do it again.
2. Sometimes we have to lecture.

My **strategy is to cut down the material I expect to cover in class, but I don't cut down the amount of material I expect them to learn**. Getting them actively involved in their learning takes more time than straight lecture.

In fact, students get very little out of lectures because they are often not prepared. They have to do more work on their own. If they have an assignment (to turn in) that requires them to work with the material prior to the lecture, it's better. But students think they get something out of lectures even if they don't. You have to remind and even sell it to them that if you haven't lectured on it, it isn't invisible. Remind them that they are responsible for their own learning.

I do entertaining things with PowerPoint to get their attention in a lecture. For example, I **embed 20 seconds of music** (e.g., the Jeopardy theme or Sinatra singing "My Way"). I do this maybe four times a semester. If I did it more, or if we all did it, it wouldn't work as well.

I **embed jokes** in PowerPoint. I do stupid fun examples. For example, I might talk about my daughter going to college to make a point, and then two slides later, they see a photograph of my (adorable) 10 month old daughter.

In PowerPoint, I also might have a **slide with a problem that students need to solve on their own**, and the next slide does not have the answer.

Also, when I lecture I am extremely **energetic and enthusiastic**, which helps students. I also might reward students with a little bag of M&Ms when they get an answer right.

**The Modified Lecture** [note from Steph Nickerson, often called, [The Enhanced Lecture](#).]: In a lecture, I will give them **quick problems to solve with another student**. For example, I have them work on a few problems and they wind up teaching each other how to use a financial calculator as well, which is something I do not necessarily want to lecture about. (I borrowed this strategy from Joel Hasbrouck.)

I ask **general questions** to the full group when I lecture, and sometimes I **cold call** but

students don't like that and I don't like the risk of their not being prepared, so usually I **warm call** (which I learned from Sanjiv Das). I alert students (sometimes teams of students) that I will be calling on them on a particular section of the material. This works very well.

Sometimes I have **tournaments** with prizes. Students generally like and get energized in long classes by team competitions. For example, in the Corporate Finance Executive MBA class, I had students estimate the Beta of 10 companies they worked for. The task was more structured than this, but the point is, we embedded a learning activity in something fun and energizing. It may have taken 30 minutes more to teach the material this way, but they learned more. Also, it's important to change the pace and the atmosphere when the class is three or, even, six hours long, as it is in mini-courses and the Executive MBA.

#### **Other comments and strategies in the large group discussion were:**

- Sridhar Seshadri: (Operations Management) Clarity is critical, as is precision. **PowerPoint makes the instructor go too fast.**
- Harry Chernoff: (Operations Management) I **give homework to hand in prior to the class** so that students come prepared. [There was general consensus that if you want students to come prepared for class, you need to make them accountable, through having to prepare something to hand in or by their knowing there will be a quiz.]
- Harry: I sometimes start off first four minutes of class with a clip of a relevant movie For example, Star Trek has an excellent scene using a simulation which I use when we discuss simulations in class.
- Marty Gruber: (Finance) I have always had **students write test questions** at the end of the course, but they could also write a test question right after they have learned particular material several times during the course.
- Ed: I have, at the end of a class, handed out 3x5 cards and asked students to write down the three most important points of the class. It is a good way of checking if they are getting what you want them to get. Then at the next class, I told them what the main points of a class were. [Note from Steph: What Ed is describing is a Classroom Assessment Technique, see hand out elsewhere on this page.]
- Menachem Brenner (Finance), Harry and Robert: [All said they use **polling the students** several times during the semester. They will take quick votes on how many students agree with one answer or another. They will sometimes add information and ask the students to vote again. This helps make a point or demonstrate than an issue may not always be intuitively solved.

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