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# White Board

Become An Effective Teacher & Save Your Valuable Teaching Time and Energy

Center for Effective Undergraduate Teaching (864) 388-8426

# CLASS PREPARATION TIME HOW MUCH IS ENOUGH?

*Too much class preparation may not pay off*

By Phillip Wankat and Frank Oreovicz

THE MYTH THAT more class preparation is always better is precisely that--a myth. Not only can it lead to mediocre teaching but it also makes us feel guilty if we reduce class preparation time, even if our teaching is excellent. This myth is particularly pernicious for new faculty members, because it robs them of time to set up research programs while not improving their teaching.

Of course, reducing preparation time by too much is clearly a bad idea. But how much is enough? Two hours for new lectures and half an hour for lectures you've given before is a good guideline. You may be asking: How can an engineering professor get away with so little? The key is starting early to prevent panic, and spending a controlled amount of preparation time focused on the most important parts of the class.

But surely, if two hours results in a good lecture, then four or eight hours will make it that much better, right? Not necessarily so. Robert Boice, in Advice for New Faculty Members: Nihil Nimus (Allyn and Bacon, 2000), notes that too much preparation time is a very common problem of new faculty members. Excessive preparation can result in too much attention to detail and "covering content" at the expense of overall student learning.

To use such a "lean and mean" process, it is important to prepare for class in small chunks of time, rather than working through an exhausting marathon of preparation. First, a few days before each lecture, take 10 or 15 minutes to develop a title and a brief conceptual outline. Then put it aside and do something else.

A day or two later, return to your preparation and reread your outline. Determine if you have captured the main points. Briefly jot down explanations and examples that explain the key items. Try a "just-in-time" approach, where you introduce an example problem to the class, and then provide the information needed to solve the problem. Use a single example with many "what-ifs" instead of several unconnected examples. Stop working on the lecture after half an hour to 45 minutes.

Later, return to the preparation and finish the details. Then look at the lecture and decide where to put the activity breaks: one or preferably two breaks in a 50-minute lecture. Even though the lecture is not perfect, now is the time to stop preparing. Remember the Pareto principle, or "80-20 rule": 80 percent of the benefit occurs in the first 20 percent of preparation time.

What you have produced is notes, not a completely written draft. If you prefer to use the blackboard or hand-write on the overhead projector, write these notes on paper or note cards. If you use a word processor or PowerPoint, you will now have a rough draft of the transparencies. One last pass through your notes will allow you to correct the worst spelling and grammatical errors and produce acceptable transparencies in minimal time. If you like, hand these out as partial class notes.

Shortly before the lecture, review your notes and prepare yourself psychologically (about 10 to 15 minutes). At this point, you will have spent about two hours on the lecture, and you should be ready to teach the class. Arrive five minutes early to prepare the classroom and chat with the students. Relax and enjoy the interaction with the students. If you make a mistake, make a joke and correct it. Control your urge to cover "just one more point" and stop on time or a minute early. Then stay a few minutes after class to chat with students.

The subtitle of Boice's book, nihil nimbus, translates as "everything in moderation"--good advice for teaching. Reducing preparation time focuses your attention on key items and gives you more time to develop and use active learning exercises that involve the students. Less detail and a more flexible set of notes will help you, and therefore the students, to relax. Need one more benefit? With your preparation process under control, you'll finish your lectures on time--earning you the students' lasting gratitude.

*ASEE Prism, September 2000, Teaching Toolbox, Volume 10, No. 1, P. 41; [http://www.prism-magazine.org/sept00/html/teaching.cfm ], March 23, 2011.*

Classes End - Apr. 22
Exams - Apr. 25-29
Commencement - Apr. 30
Faculty Meeting - Apr. 27

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*First Monday of the Month*

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# Lose the Lectures

## A physics professor relies on Q&A, class discussions

AS A YOUNG physics professor at Harvard in the 1980s, Eric Mazur was certain his lecture-hall classes were a huge success. And why wouldn't they be? His students got top grades, and his teaching evaluations were stellar. But in the early '90s, Mazur gave some of his students a series of tests that clearly showed they didn't understand the underlying concepts of what he was teaching them — even the most basic. "My illusion of being a good teacher became unraveled," Mazur admits.

His students were merely memorizing facts and regurgitating them and reproducing mathematical solutions that were not new. To Mazur, that's not learning; for him, education is assimilating information and being able to use that knowledge to solve new problems. Stuff learned by rote is quickly forgotten; but understanding is something students never lose, he believes.

So Mazur – a world-renowned researcher of ultrafast optics, particularly short-pulse lasers – began investigating another topic that's since become a second, major research area for him: science education. And he ultimately developed a novel, interactive teaching method for lecture-hall classes – Peer Instruction – that over the past decade has come into wide use around the world in a variety of disciplines.

Essentially, Mazur dispenses with lectures. Instead, he teaches by asking questions – after all, isn't science an inquiry-based discipline? Ahead of classes, students are assigned to read a certain text or watch a video, but in the classroom itself, it's Q&A time. And integral to the method is students teaching students, hence the title, Peer Instruction. Mazur asks a question about a concept, and gives students a minute or two to reflect, then another two to three minutes to discuss the question in groups of five or six and come up with a consensus answer.

Mazur stumbled upon the method when he had trouble getting a group of students to understand a simple (to him) principle, Newton's Third Law. In frustration, he told them to discuss it among themselves. They did. And they came up with the right answer.

Recent research by his Mazur Group indicates that the method does help students grasp concepts that once eluded them. There's also evidence it helps close the gender gap in grades, and improves the retention of freshman and junior students in science majors. It works, Mazur says, because those students who have deduced the correct answer have only just mastered that knowledge, so are more attuned to why their peers are still in the dark and hence can more intuitively guide them to enlightenment. The method's been documented in his book, Peer Instruction: A User's Manual, and in an award-winning DVD he coproduced, Interactive Teaching.

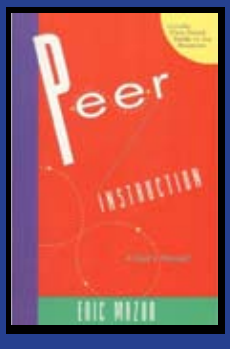
Mazur also pioneered the now popular use of wireless remotes, or "clickers," in the classroom to help gauge student understanding of material. He stresses, however, that "it's the pedagogy that matters, not the technology." His earliest attempts at interactive teaching used flashcards in lieu of clickers.

The Netherlands-born Mazur, 56, who is also dean of applied physics, continues to look for better ways to teach science. Lecture demonstrations are perhaps the most enjoyable aspect of physics classes, but passive viewing of demonstrations doesn't enhance student understanding, studies show. So his group is looking for ways to make demonstrations more effective, while keeping the fun intact.

He's also critical of researchers who find teaching a chore. Mazur finds it "shocking" that academia is so unsystematic in its approach to instruction. "I am a professor. I am supposed to be a teacher."

*Thomas K. Grose, PRISM Magazine, February 2011, [ http://www.prism-magazine.org/feb11/up-close.cfm ], March 23, 2011*

**BOOK**




Peer Instruction
Eric Mazur

Publisher:
Benjamin Cummings,
Aug. 8, 1996

# Tips for Avoiding Teaching Ruts

### Strategies that require a minimal time commitment

• Create a new assignment – New assignments can force you to reconceptualize how you've been teaching a particular section of your course, and over time may even lead to an entire course redesign.
• Use a new text – As part of the switch to a new text, you should adjust your notes and teach the course in the order the author uses. It will lend a new perspective to your course content.
• Use a supplemental text – Books about academic subjects that are written for the general public can help get students interested in your discipline.
• Read a pedagogical article/book – Whether it's College Teaching, which publishes peer-reviewed articles on how instructors across all academic disciplines can improve student learning or one of the many discipline-specific journals, reading pedagogical literature is critical, Shibley says.

### Strategies that require a moderate time commitment

• Teach a new course – Whether new to you or new to your department, teaching a course for the first time is more work, but it's also energizing.
• Audit a course – Find a course with interesting content and a great teacher and ask if you can audit his or her course – pay attention not only to the content but the pedagogy as well.

### Strategies that require a substantial time commitment

• Mentor new faculty – Helping a colleague think about their teaching can rejuvenate your own.

*Mary Bart, "But This is What I've Always Done" – Tips for Avoiding Teaching Ruts, Faculty Focus, March 28, 2011, [http://www.facultyfocus.com/articles/teaching-careers/but-this-is-what-ive-always-done-tips-for-avoiding-teaching-ruts ], March 28, 2011*