The Ten Worst Teaching Mistakes

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Like most faculty members, we began our academic careers with zero prior instruction on college teaching and quickly made almost every possible blunder. We've also been peer reviewers and mentors to colleagues, and that experience on top of our own early stumbling has given us a good sense of the most common mistakes college teachers make. In this column and one to follow we present our top ten list, in roughly increasing order of badness. Doing some of the things on the list may occasionally be justified, so we're not telling you to avoid all of them at all costs. We are suggesting that you avoid making a habit of any of them.

Mistake #10. When you ask a question in class, immediately call for volunteers.

You know what happens when you do that. Most of the students avoid eye contact, and either you get a response from one of the two or three who always volunteer or you answer your own question. Few students even bother to think about the question, since they know that eventually someone else will provide the answer. We have a suggestion for a better way to handle questioning, but it's the same one we'll have for Mistake #9 so let's hold off on it for a moment.

Mistake #9. Call on students cold.

You stop in mid-lecture and point your finger abruptly: "Joe, what's the next step?" Some students are comfortable under that kind of pressure, but many could have trouble thinking of their own name. If you frequently call on students without giving them time to think ("cold-calling"), the ones who are intimidated by it won't be following your lecture as much as praying that you don't land on them. Even worse, as soon as you call on someone, the others breathe a sigh of relief and stop thinking. A better approach to questioning in class is active learning.[1] Ask the question and give the students a short time to come up with an answer, working either individually or in small groups. Stop them when the time is up and call on a few to report what they came up with. Then, if you haven't gotten the complete response you're looking for, call for volunteers. The students will have time to think about the question, and-unlike what happens when you always jump directly to volunteers (Mistake #10)-most will try to come up with a response because they don't want to look bad if you call on them. With active learning you'll also avoid the intimidation of cold-calling (Mistake #9) and you'll get more and better answers to your questions. Most importantly, real learning will take place in class, something that doesn't happen much in traditional lectures.[2]

Mistake #8. Turn classes into PowerPoint shows.

It has become common for instructors to put their lecture notes into PowerPoint and to spend their class time mainly droning through the slides. Classes like that are generally a waste of time for everyone.[3] If the students don't have paper copies of the slides, there's no way they can keep up. If they have the copies, they can read the slides faster than the instructor can lecture through them, the classes are exercises in boredom, the students have little incentive to show up, and many don't.

Turning classes into extended slide shows is a specific example of:
Mistake #7. Fail to provide variety in instruction.

Nonstop lecturing produces very little learning,[2] but if good instructors never lectured they could not motivate students by occasionally sharing their experience and wisdom. Pure PowerPoint shows are

ineffective, but so are lectures with no visual content-schematics, diagrams, animations, photos, video clips, etc.-for which PowerPoint is ideal. Individual student assignments alone would not teach students the critical skills of teamwork, leadership, and conflict management they will need to succeed as professionals, but team assignments alone would not promote the equally important trait of independent learning. Effective instruction mixes things up: boardwork, multimedia, storytelling, discussion, activities, individual assignments, and group work (being careful to avoid Mistake #6). The more variety you build in, the more effective the class is likely to be.

Mistake #6. Have students work in groups with no individual accountability.

All students and instructors who have ever been involved with group work know the potential downside. One or two students do the work, the others coast along understanding little of what their more responsible teammates did, everyone gets the same grade, resentments and conflicts build, and the students learn nothing about high-performance teamwork and how to achieve it. The way to make group work work is cooperative learning, an exhaustively researched instructional method that effectively promotes development of both cognitive and interpersonal skills. One of the defining features of this method is individual accountability-holding each team member accountable for the entire project and not just the part that he or she may have focused on. References on cooperative learning offer suggestions for achieving individual accountability, including giving individual exams covering the full range of knowledge and skills required to complete the project and assigning individual grades based in part on how well the students met their responsibilities to their team.[4,5]

Mistake #5. Fail to establish relevance.

Students learn best when they clearly perceive the relevance of course content to their interests and career goals. The "trust me" approach to education ("You may have no idea now why you need to know this stuff but trust me, in a few years you'll see how important it is!") doesn't inspire students with a burning desire to learn, and those who do learn tend to be motivated only by grades. To provide better motivation, begin the course by describing how the content relates to important technological and social problems and to whatever you know of the students' experience, interests, and career goals, and do the same thing when you introduce each new topic. (If there are no such connections, why is the course being taught?) Consider applying inductive methods such as guided inquiry and problem-based learning, which use real-world problems to provide context for all course material.[6] You can anticipate some student resistance to those methods, since they force students to take unaccustomed responsibility for their own learning, but there are effective ways to defuse resistance, [7]; and the methods lead to enough additional learning to justify whatever additional effort it may take to implement them.

Mistake #4. Give tests that are too long.

Engineering professors routinely give exams that are too long for most of their students. The exams may include problems that involve a lot of time-consuming mathematical analysis and/or calculations, or problems with unfamiliar twists that may take a long time to figure out, or just too many problems. The few students who work fast enough to finish may make careless mistakes but can still do well thanks to partial credit, while those who never get to some problems or who can't quickly figure out the tricks get failing grades. After several such experiences, many students switch to other curricula, one factor among several that cause engineering enrollments to decrease by 40% or more in the first two years of the curriculum. When concerns are raised about the impact of this attrition on the engineering pipeline, the instructors argue that the dropouts are all incompetent or lazy and unqualified to be engineers. The instructors are wrong. Studies that have attempted to correlate grades of graduates with subsequent career success (as measured by promotions, salary increases, and employer evaluations) have found that the correlations are negligible [8]; students who drop out of engineering have the same academic profile as those who stay [9]; and no one has ever demonstrated that students who can solve a

quantitative problem in 20 minutes will do any better as engineers than students who need 35 minutes. In fact, students who are careful and methodical but slow may be better engineers than students who are quick but careless. Consider which type you would rather have designing the bridges you drive across or the planes you fly in. If you want to evaluate your students' potential to be successful professionals, test their mastery of the knowledge and skills you are teaching, not their problem-solving speed. After you make up a test and think it's perfect, take it and time yourself, and make sure you give the students at least three times longer to take it than you needed (since you made it up, you don't have to stop and think about it)-and if a test is particularly challenging or involves a lot of derivations or calculations, the ratio should be four or five to one for the test to be fair.[10]

Mistake #3: Get stuck in a rut
Some instructors teach a course two or three times, feel satisfied with their lecture notes and PowerPoint slides and assignments, and don't change a thing for the rest of their careers except maybe to update a couple of references. Such courses often become mechanical for the instructors, boring for the students, and after a while, hopelessly antiquated. Things are always happening that provide incentives and opportunities for improving courses. New developments in course subject areas are presented in research journals; changes in the global economy call on programs to equip their graduates with new skills; improved teaching techniques are described in conference presentations and papers; and new instructional resources are made available in digital libraries such as SMETE (www.smete.org), Merlot (www.merlot.org/merlot/index.htm), and the MIT Open Courseware site (http://ocw.mit.edu). This is not to say that you have to make major revisions in your course every time you give it-you probably don't have time to do that, and there's no reason to. Rather, just keep your eyes open for possible improvements you might make in the time available to you. Go to some education sessions at professional conferences; read articles in educational journals in your discipline; visit one or two of those digital libraries to see what tutorials, demonstrations, and simulations they've got for your course; and commit to making one or two changes in the course whenever you teach it. If you do that, the course won't get stale, and neither will you.

Mistake #2. Teach without clear learning objectives
The traditional approach to teaching is to design lectures and assignments that cover topics listed in the syllabus, give exams on those topics, and move on. The first time most instructors think seriously about what they want students to do with the course material is when they write the exams, by which time it may be too late to provide sufficient practice in the skills required to solve the exam problems. It is pointless-and arguably unethical-to test students on skills you haven't really taught. A key to making courses coherent and tests fair is to write learning objectives-explicit statements of what students should be able to do if they have learned what the instructor wants them to learn-and to use the objectives as the basis for designing lessons, assignments, and exams.[11] The objectives should all specify observable actions (e.g., define, explain, calculate, solve, model, critique, and design), avoiding vague and unobservable terms like know, learn, understand, and appreciate. Besides using the objectives to design your instruction, consider sharing them with the students as study guides for exams. The clearer you are about your expectations (especially high-level ones that involve deep analysis and conceptual understanding, critical thinking, and creative thinking), the more likely the students will be to meet them, and nothing clarifies expectations like good learning objectives.

Mistake #1. Disrespect students.
How much students learn in a course depends to a great extent on the instructor's attitude. Two different instructors could teach the same material to the same group of students using the same methods, give identical exams, and get dramatically different results. Under one teacher, the students might get good grades and give high ratings to the course and instructor; under the other teacher, the grades could be low, the ratings could be abysmal, and if the course is a gateway to the curriculum,

many of the students might not be there next semester. The difference between the students' performance in the two classes could easily stem from the instructors' attitudes. If Instructor A conveys respect for the students and a sense that he/she cares about their learning and Instructor B appears indifferent and/or disrespectful, the differences in exam grades and ratings should come as no surprise. Even if you genuinely respect and care about your students, you can unintentionally give them the opposite sense. Here are several ways to do it: (1) Make sarcastic remarks in class about their skills, intelligence, and work ethics; (2) disparage their questions or their responses to your questions; (3) give the impression that you are in front of them because it's your job, not because you like the subject and enjoy teaching it; (4) frequently come to class unprepared, run overtime, and cancel classes; (5) don't show up for office hours, or show up but act annoyed when students come in with questions. If you've slipped into any of those practices, try to drop them. If you give students a sense that you don't respect them, the class will probably be a bad experience for everyone no matter what else you do, while if you clearly convey respect and caring, it will cover a multitude of pedagogical sins you might commit.

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