

Do Students Really Learn Nothing From a Lecture?

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I've been following, with something like exasperation, the discussion over Harvard University's new study on teaching. Not surprisingly, the study found that physics students performed better on multiple-choice tests if they were taught via active-learning strategies than by lecture alone. Yet it also found that students tended to feel they learned more from listening to a polished lecture.



None of that should have been very notable. By now, many studies have demonstrated the superiority of active-learning strategies in the college classroom. Likewise, Robert and Elizabeth Bjork have been conducting research for 25 years on the misleading effects of fluency — e.g., students listening to a well-written lecture and thinking they've learned the material well.

What was notable, and what got people talking, was the breathless tone of Harvard's news release trumpeting the study's results. In particular, it quoted Eric Mazur saying that "this work unambiguously debunks the illusion of learning from lectures" — a remark that would be laughable if it weren't coming from such an important and well-respected figure.

As you read what follows, keep in mind, I am no blind defender of the lecture; I just think it's important to know precisely why lectures often fail.

Let's first deal with Mazur's comment on the substance. Even a cursory reading of the study's results takes us nowhere near his "unambiguously debunks" conclusion. The study showed that students fared worse on tests if they were taught by lectures alone. That finding does not suggest that "learning from lectures" is a complete illusion — only that students don't learn as much, or as well, as they do from active-learning strategies.

As always with research, it's worth looking closely at the methodology to see exactly what the study does — and does not — demonstrate. "Lecture" is a famously ambiguous term: How, exactly, did these researchers define it?

According to the study's "materials and methods" section, students in one group "were told directly how to solve each problem" in a lecture; in the other, they "were asked to try to solve the problems themselves in small groups before being given the solution." And therein lies the trouble: Lecturing is always going to come up short when you assume that students will learn as much from being told how to solve a problem as from trying to solve it.

But it's a big leap to claim that *any* learning from lecture is an illusion.

Here's a good example of what I mean. Just last week, my 6-year-old daughter mentioned a Steve Martin movie, *The Pink Panther*, that we'd watched several months ago. "Do you remember in *Pink Panther* when he got his finger caught in the door?" she asked. To most people, her comment would seem unremarkable, but it immediately got me thinking about lecturing — because if it were impossible to learn from listening to a lecture, my daughter would not still be talking about a movie she saw a few months ago.

After all, what was she doing when the movie was on but just sitting there, passively watching and listening? I did not pause the movie and engage her in a think-pair-share to help cement her knowledge of the scene. Nor did I administer a pre-movie quiz to give her a little heads up on what to look for.

She remembered the scene because she was deeply engaged, because she's at a stage when slapstick humor is right up her alley, and because, well, it's a really funny movie. If we care, if we are entertained, if it matters to us, we pay attention to what we are watching and listening to in a way that helps the material stick.

So why, then, is Eric Mazur, one of the more famous progenitors of innovative-science pedagogy, claiming that students can't learn anything from a lecture? My guess: He thinks hyperbole is necessary to get through to the old-fashioned professors who still drone on, delivering a two-hour lecture while their students struggle to stay awake.

I get that. But I also worry that hyperbole and mischaracterization are poor methods for persuading faculty members to improve their teaching. If you insist that students can't learn a thing from a lecture — when they plainly can — you're not going to sway many professors.

Part of the problem is the variable definition of "lecture." Derek Bruff, director of Vanderbilt University's Center for Teaching, wrote about this in a [2015 blog post](#) (which underscores just how long academics have been debating the pros and cons of lecture). In the research comparing lecturing with active-learning strategies, he wrote, "lecture" has a "fairly specific" definition: It means "continuous exposition by the teacher."

Some professors still lecture that way, but plenty of others don't. As Bruff noted, when many instructors "hear the word 'lecture,' they don't think 'continuous exposition'" — they think intermittent. "I see myself as someone who practices active-learning instruction," he wrote. "Yes, I lecture, too. Just not continuously. A well-timed explanation can be very effective at promoting student learning."

But because academics define lecture in different ways, when it comes time to discuss the role and value of lecturing in the college classroom, they "talk right past each other," Bruff wrote. And Harvard's latest spin on its new study is more of the same.

Maybe it's time we stopped harping about this or that teaching strategy, and shifted our focus to how students learn. As instructors, our assumptions about how students learn are far more important than whatever teaching strategy we put in place in the classroom. Another study on teaching, [published in February](#), suggests that the way we think about how our students learn may be the most important factor of all.

The study, led by Elizabeth A. Canning, a postdoctoral researcher at Indiana University, set out to examine the effects of instructor mind-set on student performance. Canning and her co-authors surveyed 150 faculty members in science and mathematics to find out the extent to which they believe intelligence is fixed or malleable. Drawing on research [pioneered by](#) the Stanford psychology professor Carol Dweck, the researchers hypothesized that faculty mind-set would influence how they taught their courses.

Examining the grades of more than 15,000 students who took courses taught by that pool of 150 faculty members, the study found that students performed more poorly in courses taught by an instructor with a fixed mind-set — i.e., one who believes that intelligence and ability are set in stone, unable to be developed through practice or good teaching. By contrast, if instructors had a "growth mind-set" — that is, if they believe that intelligence is something that can be developed — their students tended to do well.

Even more strikingly, the achievement gap between white students and those in underrepresented minority groups (blacks, Latinx, and Native Americans) was nearly twice as wide in courses taught by an instructor with a fixed mind-set. No other characteristic — the instructor's race, gender, age, tenure status, teaching experience — explained those students' underperformance. For instance, if all other factors were the same, black students fared no better in courses taught by a black instructor. Having a nonwhite instructor didn't shrink the gap, but having an instructor with a growth mind-set did.

The single characteristic that predicted how well underrepresented students would do, in relation to white students, was what their instructors believed about human intelligence and learning.

Note that Canning and her colleagues did not check to see whether instructors used lectures, active-learning strategies, or some combination. What matters more than the particular teaching techniques you use, I suspect, is the spirit in which you use them. A lecture delivered to students you see as fixed quantities — you think some are smart enough to handle the material while others aren't and never will be — is going to take a certain shape. A lecture designed with the understanding that students can improve with the right combination of practice and feedback will probably look a lot different.

Beyond that are your beliefs about how students learn. You are more likely to give an effective lecture if you are thinking about how students learn as you prepare it. If you compose and deliver a lecture thinking that you can just pour knowledge into students' heads, you're not going to succeed nearly as well. And that's not because you "lectured." It's because you were working off of faulty pedagogical assumptions (and/or couldn't be bothered to teach more effectively).

Learning works through active engagement by the learner. Only students can do the work of learning; all the instructor can do is try to create the conditions within which students are more likely to do that work.

It is a scandal that most Ph.D.s still do not go through any kind of formalized pedagogical training in graduate school. But what they lack most is not so much strategies and tactics (helpful as those are), but rather, a deep understanding of how students learn, and how we can help them in that process.

I've been writing about teaching for *The Chronicle* for several years and my new book, *The Missing Course: Everything They Never Taught You About Teaching*, has all sorts of tips and practical strategies. But my goal in writing it, above all, was to inspire readers to think more broadly and deeply about learning, and about our role as facilitators of learning. The mind-set that you bring to the college classroom is far more important than your lesson plans.

So no, I don't think that telling students how to solve problems is an effective way to teach. But an engaging lecture that entices students to see a difficult subject in a new light might be. So might a lecture broken up with opportunities for students to respond, collaborate, and apply and practice skills. Or a lecture that follows on the heels of students trying to solve a problem too difficult for their current skill set.

Those are teaching strategies that take the challenges of learning seriously, that are built on the assumption that if students are to learn, at some point they have to engage and revise their current knowledge. Lectures can be good teaching, but only if they are designed to

produce good learning.

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