might think I am, my teaching is only a component of their learning, and how I structure it has a lot to do with it, maybe even more." Meanwhile, the course enrollment has grown to 185 and counting.

Exploring Nuances

Andy Sobel's example is anecdotal and likely reflects a variety of beneficial influences, not least being the cumulative learning effects that accrue like compounded interest when course material is carried forward in a regime of quizzes across an entire semester. Nonetheless, his experience squares with empirical research designed to tease apart the effects and nuances of testing.

For example, in one experiment college students studied prose passages on various scientific topics like those taught in college and then either took an immediate recall test after the initial exposure or restudied the material. After a delay of two days, the students who took the initial test recalled more of the material than those who simply restudied it (68 v. 54 percent), and this advantage was sustained a week later (56 v. 42 percent). Another experiment found that after one week a study-only group showed the most forgetting of what they initially had been able to recall, forgetting 52 percent, compared to a repeated-testing group, who forgot only 10 percent.[11]

Start here:

How does giving feedback on wrong answers to test questions affect learning? Studies show that giving feedback strengthens retention more than testing alone does, and, interestingly, some evidence shows that delaying the feedback briefly produces better long-term learning than immediate feedback. This finding is counterintuitive but is consistent with researchers'

discoveries about how we learn motor tasks, like making layups or driving a golf ball toward a distant green. In motor learning, trial and error with delayed feedback is a more awkward but effective way of acquiring a skill than trial and correction through immediate feedback; immediate feedback is like the training wheels on a bicycle: the learner quickly comes to depend on the continued presence of the correction.

In the case of learning motor skills, one theory holds that when there's immediate feedback it comes to be part of the task, so that later, in a real-world setting, its absence becomes a gap in the established pattern that disrupts performance. Another idea holds that frequent interruptions for feedback make the learning sessions too variable, preventing establishment of a stabilized pattern of performance.[12]

In the classroom, delayed feedback also yields better long-term learning than immediate feedback does. In the case of the students studying prose passages on science topics, some were shown the passage again even while they were asked to answer questions about it, in effect providing them with continuous feedback during the test, analogous to an open-book exam. The other group took the test without the study material at hand and only afterward were given the passage and instructed to look over their responses. Of course, the open-book group performed best on the immediate test, but those who got corrective feedback after completing the test retained the learning better on a later test. Delayed feedback on written tests may help because it gives the student practice that's spaced out in time; as discussed in the next chapter, spacing practice improves retention.[13]

End here

Are some kinds of retrieval practice more effective for long-term learning than others? Tests that require the learner to