PHOTO / MARTHA STEWART

Eighth-Grade Students Learn More through Direct Instruction

Should teachers stand in front of the class and present the material to be learned? Or should learning be more dynamic, with students solving problems, either on their own or under the teacher's guidance? Which approach yields the most student learning?

Opinion on this question is deeply divided. "The sage on the stage" versus "the guide on the side" is how the debate is often framed. Proponents of the former ruled the education roost throughout the 19th century, but in the 20th century a child-centered doctrine, developed by John Dewey in the gardens surrounding the University of Chicago's Laboratory School, then refined at Columbia University's Teachers College, gained the high ground, as "inquiry-based" and "problem-solving" became the pedagogies of choice, certainly as propounded by education-school professors. In recent years, the earlier view has staged something of a comeback, as KIPP and other "No Excuses" charter schools have insisted on devoting hours of class time to direct instruction, even to drill and memorization.

As an instructor myself, I've had trouble making up my mind. I can cover a lot of ground in classes where lectures consume about two-thirds of the time. But those classes get less enthusiastic student evaluations than some smaller classes where students are encouraged to solve problems through discussion. I, too, like those problem-solving classes. They require less preparation and are easier to teach.

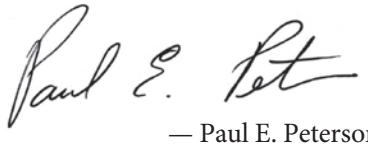
So I can easily understand why progressive pedagogy has proven popular. It's more enjoyable for all concerned, even if sometimes you worry that you are not teaching very much.

The question of which approach works best for student learning has seldom been a topic for careful empirical inquiry. So when Guido Schwerdt and Amelie Wuppermann figured out a way to test empirically the relative value of the two teaching styles (see "Sage on the Stage," *research*, page 62), it is worth trumpeting the findings. These analysts took advantage of the fact that the 2003 Trends in International Mathematics and Science Survey (TIMSS) not only tested a nationally representative sample of U.S. 8th graders in math and science, but also asked their teachers what percentage of class time was taken up by students "listening to lecture-style presentations" rather than either "working on problems with the teacher's guidance" or "working on problems without guidance." Teachers reported that they spent twice as much time on problem-solving activities as on direct instruction. In other words, U.S. middle-school teachers have drunk deep from the progressive pedagogical well.

To see whether this tilt toward the problem-solving approach helps middle schoolers learn, Schwerdt and Wuppermann identified those 8th graders who had the same classmates in both math and science, but different teachers. Then they estimated the impact on student learning of class time allocated to direct instruction versus problem solving. Under which circumstance did U. S. middle-school students learn more?

Direct instruction won. Students learned 3.6 percent of a standard deviation more if the teacher spent 10 percent more time on direct instruction. That's one to two months of extra learning during the course of the year.

The students who benefited most from direct instruction were those who were already higher-performing at the beginning of the year. But even initial low performers learned more when direct instruction consumed more class time. Sadly, U.S. middle-school pedagogy is weighted heavily toward problem-solving.



— Paul E. Peterson