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Matching Teaching Style to Learning Style May Not Help Students

By David Glenn

If you've ever sat through a teaching seminar, you've probably heard a lecture about "learning styles." Perhaps you were told that some students are visual learners, some are auditory learners, and others are kinesthetic learners. Or maybe you were given one of the dozens of other learning-style taxonomies that scholars and consultants have developed.

Almost certainly, you were told that your instruction should match your students' styles. For example, kinesthetic learners—students who learn best through hands-on activities—are said to do better in classes that feature plenty of experiments, while verbal learners are said to do worse.

Now four psychologists argue that you were told wrong. There is no strong scientific evidence to support the "matching" idea, they contend in a paper published this week in *Psychological Science in the Public Interest*. And there is absolutely no reason for professors to adopt it in the classroom.

"We were startled to find that there is so much research published on learning styles, but that so little of the research used experimental designs that had the potential to provide decisive evidence," says Harold E. Pashler, a professor of psychology at the University of California at San Diego and the paper's lead author.

"Lots of people are selling tests and programs for customizing education that completely lack the kind of experimental evidence that you would expect for a drug," Mr. Pashler says. "Now maybe the FDA model isn't always appropriate for education—but that's a conversation we need to have."

Advocates of learning styles respond that Mr. Pashler is the one who lacks evidence. Robert J. Sternberg, dean of arts and sciences at Tufts University and a psychologist who has done a lot of work on learning styles, says in an e-mail message to *The Chronicle* that the researchers did not fully survey the scholarly literature, and thus "come across looking either biased about or largely ignorant of the field."

Mr. Pashler's study does not dispute the existence of learning styles. But it asserts that no one has ever proved that any particular style of instruction simultaneously helps students who have one learning style while also harming students who have a different learning style.

Of the hundreds of research papers that have been published on learning styles, Mr. Pashler says, almost none have randomly assigned students into one classroom type or another. Only that kind of experiment, he says, can suggest anything definitive about causation. And the few studies that have used an adequate research design, he adds, have mostly failed to support the hypothesis that teaching styles should match students' learning styles.

More Alike Than Different

Consider an experiment about teaching the structure of complex molecules. The matching hypothesis might predict that kinesthetic learners would absorb the concept best by building ball-and-stick models in the lab, while verbal learners would do better by reading a few pages about the logic of molecular design.

That sounds intuitive. But according to Mr. Pashler and his co-authors, almost every well-designed study of that type has discovered that one instructional style actually works best for both groups.

What happens, Mr. Pashler says, is something like this: Experimenters randomly assign students to a classroom that uses laboratory lessons or to a classroom that uses texts. At the end of the week, students are tested on their knowledge of molecular structures.

Among the students who are taught in a hands-on laboratory setting, it turns out that the kinesthetic learners enjoy their lessons much more than their verbal peers do. They also perform better on the test at the end of the week. Let's say that the kinesthetic students average a 95 on the test, while the verbal students' average is 80.

That might seem like strong evidence for the learning-styles hypothesis. Not so fast, Mr. Pashler says.

Look at the second classroom, where students learn about molecules by reading texts. Here, the verbal students enjoy the lessons much more than their kinesthetic peers do. But on the test, both the verbal and kinesthetic students average around 70. The verbal students are actually better off learning this concept in a laboratory, even though they enjoy it less.

In almost every actual well-designed study, Mr. Pashler and his colleagues write, the pattern is similar: For a given lesson, one instructional technique turns out to be optimal for all groups of students, even though students with certain learning styles may not love that technique.

Matching Style With Content

What this means for instructors, Mr. Pashler says, is that they should not waste any time or energy trying to determine the composition of learning styles in their classrooms. (Are 50 percent of my students visual learners? Are 20 percent of them kinesthetic learners?)

Instead, teachers should worry about matching their instruction to the content they are teaching. Some concepts are best taught through hands-on work, some are best taught through lectures, and some are best taught through group discussions.

If the matching hypothesis is not well supported, then why do so many learning-styles studies show positive effects? Hundreds of studies that do not meet Mr. Pashler's stringent criteria for experimental design suggest—at least loosely—that students do better when instructors are trained in learning-styles theory.

One possibility is that the mere act of learning about learning styles prompts teachers to pay more attention to the kinds of instruction they are delivering. An instructor who attends a learning-styles seminar might start to offer a broader mixture of lectures, discussions, and laboratory work—and that variety of instruction might turn out to be better for all students, irrespective of any "matching."

"Even though the learning-style idea might not work," says Richard E. Mayer, a professor of psychology at the University of California at Santa Barbara, "it might encourage teachers to think about how their students learn and what would be the best instructional methods for a particular lesson."

In other words, learning-styles seminars might be effective, but not for the reasons that their designers believe.

Mr. Mayer helped lead a study six years ago that failed to find any relationship between instructional styles and the performance of "verbalizer" and "visualizer" students. He believes that Mr. Pashler and his colleagues have done strong work in debunking the matching hypothesis.

Bibliography Is Faulted

But not everyone is impressed by the new paper. Mr. Sternberg of

Tufts (and a former longtime professor of psychology at Yale University), says in his e-mail message that while he holds Mr. Pashler and his colleagues in high esteem, he believes they did a poor job here.

Several of the most-cited researchers on learning styles, Mr. Sternberg points out, do not appear in the paper's bibliography. "The authors draw negative conclusions about a field they fail adequately to review," Mr. Sternberg says.

Mr. Sternberg and several colleagues have worked intensively on [models of learning styles](#) for more than a decade. In 1999, he and three co-authors published a paper in the *European Journal of Psychological Assessment* that found that students who were strongly oriented toward "analytical," "creative," or "practical" intelligence did better if they were taught by instructors who matched their strength. (In their paper, Mr. Pashler and his colleagues cite Mr. Sternberg's 1999 study as the only well-designed experiment to have found such a pattern—though they add that the study "has peculiar features that make us view it as providing only tenuous evidence.")

Susan M. Rundle, a learning-styles consultant who is working with instructors at Alabama A&M University, also says that the research base is much stronger than Mr. Pashler and his colleagues believe. And she adds that the paper's focus on the "matching hypothesis" is somewhat beside the point.

"In my work in higher education, I've found that it's difficult to get professors to match their instruction to their students," says Ms. Rundle, who is president of Performance Concepts International, which promotes a learning-styles model developed by Kenneth J. Dunn, a professor of education at City University of New York's Queens College, and the late Rita Dunn, who taught for many years at St. John's University, in Queens.

"What we do try to get professors to do," Ms. Rundle says, "and where we've been successful, is to become aware of their own learning style and how that affects the way they teach. What are some things that they can do in the classroom other than just lecturing?"

The Trouble With Tracking

The grandfather of this territory is David A. Kolb, a professor of organizational behavior at Case Western Reserve University, who began to study learning styles in the late 1960s. In an interview, Mr. Kolb agrees with Mr. Sternberg that Mr. Pashler's review of the literature seems too thin.

But Mr. Kolb also says that the paper's bottom line is probably correct: There is no strong evidence that teachers should tailor their instruction to their students' particular learning styles. (Mr. Kolb has argued for many years that college students are better off if they choose a major that fits their learning style. But his advice to teachers is that they should lead their classes through a full "learning cycle," without regard to their students' particular styles.)

"Matching is not a particularly good idea," Mr. Kolb says. "The paper correctly mentions the practical and ethical problems of sorting people into groups and labeling them. Tracking in education has a bad history."

Mr. Pashler, for his part, says that he and his colleagues are still open to the idea that some kinds of matching are actually effective. "Most of what we're pointing to in this paper is an absence of evidence," he says. "Here's what you have to show—and they aren't showing it. But there may yet be better studies in the future."

Mr. Pashler's co-authors are Mark McDaniel, a professor of psychology at Washington University in St. Louis; Doug Rohrer, an associate professor of psychology at the University of South Florida; and Robert A. Bjork, a professor of psychology at the University of California at Los Angeles.

The paper, "Learning Styles: Concepts and Evidence," will be published online later this week. *The Chronicle* will add a link to the paper when it becomes available.

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