

## FACULTY PERSPECTIVE

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## Defining good science

*Fear by some university researchers that one particular group has the power to define what counts as good science has had ripple effects throughout education*

BY ELIZABETH A. ST.PIERRE

Scientifically based research or evidence-based research has become a hot topic in educational research at the beginning of the 21st century. The stakes are high, because the very nature of science and scientific evidence and, by extension, the nature of knowledge itself is being contested by scholars and researchers who work from different theoretical and methodological perspectives.

The call for rigorous science and quality evidence affects not only educational researchers but also classroom teachers, who find that experience and instinct are no longer sufficient grounds for teaching. Educators agree that their practice should be grounded in rigorous research; however, many are concerned that the federal government's definition of scientifically based research is too narrow and therefore may adversely affect research and practice.

### How we got here

In recent years, we've experienced a "quality revolution" in all sectors of society that has produced a demand for increased accountability. In industry, for example, Total Quality Management monitors the quality of a product from conception to production, and similar approaches to ensuring high quality

products have leaked into education. When George W. Bush signed the No Child Left Behind Act (NCLB) into law on Jan. 8, 2002, the pressure on schools increased exponentially to produce quality graduates.

Surely, no teacher, no principal, no superintendent, no parent, no policymaker has ever wanted to leave children behind; unfortunately, there's plenty of scientific evidence to show that we've done just that. Further, research shows that children who suffer in schools are often our most vulnerable. We know that there are complex problems that contribute to failure in schools, yet as my colleague, Michael Feuer at the National Academies, reminds us, legislators and other policymakers often want guidance based on research to help them make difficult decisions about schools and schooling. And when we face tough challenges, it's not unusual for us to turn to science for answers. Thus, it shouldn't be surprising that NCLB has at least 111 references to scientifically based research. Clearly, many of our government officials think that better science will make better schools.

### What is scientifically based research?

The meaning of scientifically based research continues to evolve from definitions in the Reading Excellence Act of 1999 to those in NCLB in 2002, and the concept is still being debated in the literature, at conferences

and in schools. NCLB [Section 9101(37)] defines scientifically based research as research that is rigorous, systematic, objective, replicable, generalizable, empirical and (to the dismay of quite a few researchers who don't think the government should mandate methodology) preferably experimental. In fact, the Institute of Education Sciences, the arm of the U.S. Department of Education that funds educational research, has stated that experimental research that uses randomized control trials is the gold standard in causal studies that address questions like — What are the effects of reducing class size on student achievement? Further, causal studies are privileged since they, supposedly, can best tell us what works in schools.

Experimental research that uses randomized control trials is one kind of quantitative research, and it often involves counting and measuring in order to predict and control what will happen. Critics of randomized control trials say that they can be very expensive and difficult to bring off in educational settings where variables cannot easily be controlled. Even though this kind of research has provided very important knowledge in education, many researchers, including those who do randomized control trials, don't believe that experimental research is necessarily the "best" science in every case or the only kind of research we need.