

NEWSLETTER

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Using **SCIENTIFICALLY BASED RESEARCH** *in Schools*

USE SCIENCE TO IMPROVE TEACHING. *This idea has surfaced repeatedly in education literature since the passage of No Child Left Behind (NCLB), where the term “scientifically based research” appears more than 100 times. Yet despite all the attention that has been given to the idea of applying science in the classroom, principals and teachers often remain puzzled about how to do just that. This month’s newsletter provides practical suggestions for reading and understanding scientifically based research and for applying the principles of scientific inquiry to both teaching and student learning.*

Why apply science to classroom practice?

When a similar question was posed at a U.S. Department of Education (ED) Working Group Conference on the use of scientifically based research in education, presenter Valerie Reyna, senior research advisor at ED’s Institute of Education Sciences, offered a simple but thought-provoking response: “If you didn’t base practice on scientific research, what [would] you base it on?” (ED, 2002, p.5). The alternatives, Reyna suggested, are basing practice on tradition or on anecdotal evidence.

Following tradition (as in “we do it this way because this is the way we have always done it”), although comforting, risks ignoring new realities or rapidly changing circumstances found in so many classrooms today. Relying on anecdotal evidence poses similar risks.

The observations of even a seasoned teacher might in fact prove to be exceptions rather than the rule. As Reyna observed, “We know on the basis of experience that anecdotes have turned out to be false and misleading. Sometimes they are very representative; sometimes they’re not” (ED, 2002, p. 5).

Scientific inquiry offers an alternative. “[It] is after all an enterprise that attempts to distill from the cacophony of ideas and anecdotes and impressions, the nuggets of really enduring value, and that kind of knowledge upon which you would want to base important decisions about kids, about schools and about, ultimately, ourselves” stated Michael Feuer, executive director of the Division of Behavioral and Social Sciences and Education at the National Academies, at the Working Group Conference (ED, 2002, p. 20).

How can teachers use scientifically based research?

Incorporating scientifically based research into classroom practice is a challenging and often daunting enterprise. One of the most effective starting points can be through participation in professional learning communities, gatherings of teachers and administrators dedicated to improving teaching practice through reading and reflection.

Within these supportive communities, teachers have an opportunity both to become familiar with research and to apply what they learn. The forum of a professional learning community provides teachers an opportunity to read research on issues they care about most. This dedicated time, if properly structured, promotes reflection and encourages conversations about what the research says and its classroom implications. Engaging in professional learning communities encourages teachers to develop practice that is “research based” and “data driven” (Eaker, DuFour, & DuFour, 2002). For example, teachers interested in increasing the complexity of reading comprehension skills in young students might read the 2005 study by Joanna P. Williams titled *Instruction in Reading Comprehension for Primary-Grade Students: A Focus on Text Structure*. In a series of meetings, teachers could examine the three experimental studies, pose questions about the research, discuss the variety of instructional programs the author tested, and determine the applicability of this research to their own classrooms.

Establishing professional learning communities in the busy lives of schools can be challenging. Some common barriers include finding sufficient time to meet, keeping discussion focused, and struggling

Resources

The Center for Comprehensive School Reform and Improvement continues to identify scientifically based research on many school improvement issues. School teams considering texts for learning community discussion might consult the following:

- High-Achieving Middle Schools for Latino Students in Poverty*
This brief summarizes the research into the characteristics of middle schools in which Latino students from low-income families make significant achievement gains. The research brief is available online at http://www.centerforcsri.org/files/Center_RB_oct05.pdf
 - What Does the Research Tell Us About Teacher Leadership?*
This document provides a summary of a meta-analysis investigating research from the past two decades into the concept and practice of teacher leadership. The research brief is available online at http://www.centerforcsri.org/files/Center_RB_sept05.pdf
- Dorfman, D., & Fisher, A. (2002). *Building relationships for student success: School-family-community partnerships and student achievement in the Northwest*. Portland, OR: Northwest Regional Educational Laboratory. Retrieved October 27, 2005, from <http://www.nwrel.org/partnerships/cloak/booklet2.pdf>

Eaker, R., DuFour, R., & DuFour, R. (2002). *Getting started: Reculturing schools to become professional learning communities*. Bloomington, IN: National Educational Service.

French, V. (2004). *T-Rex*. Cambridge, MA: Candlewick.

Mason, S. (2003, April). *Learning from data: The role of professional learning communities*. Paper presented at the annual conference of the American Educational Research Association, Chicago. Retrieved October 27, 2005, from <http://www.wcer.wisc.edu/mps/AERA%202003/Learning%20from%20Data%204%2016%202%20FINAL.doc>

U.S. Department of Education. (2002, February). *The use of scientifically based research in education, Working Group Conference*. Washington, DC: Author. Retrieved October 27, 2005, from <http://www.ed.gov/nclb/methods/whatworks/research/transcript.pdf>

Williams, J. P. (2005, March). Instruction in reading comprehension for primary-grade students: A focus on text structure. *Journal of Special Education* 39(1), 6–18.

with the technical language of research. If schools are committed to using scientific research, though, these barriers can be overcome. Discussion can begin on a small scale, during common planning time or during a portion of faculty meetings. Discussion can be kept on track with the establishment of a structured agenda, assigned time limits, or even the appointment of one of the group's members to act as a facilitator. It might also prove useful for group members to solicit help in interpreting the technical language of research reports from a university professor or district research staff.

How can teachers apply scientific inquiry in their classrooms?

In addition to reading and reflecting on scientifically based research, teachers can apply what they read by informally replicating investigations within their classrooms and conducting scientific inquiry of their own. For example, they might decide, alone or as a group, to apply some proven strategies for increasing family involvement as a means of supporting student achievement. Together they might read the 2002 work of researchers Diane Dorfman and Amy Fisher, *Building Relationships for Student Success: School-Family-Community Partnerships and Student Achievement in the Northwest*, and implement some of the successful strategies it identifies, such as using instructional techniques that draw connections between students' lives and their families and communities; giving families tools to support their children; and building mutually respectful relationships. As they try out these strategies, recording their observations, discussing their findings, and using what they find to continue to refine their practice, teachers foster a spirit of scientific inquiry in their classrooms and become more reflective about their own practice.

Teachers can foster this same spirit in their students. Young children can be taught to pose important questions, suggest theories, and seek evidence to corroborate their inquiries. A recent children's book indicates that it's never too early to begin this process. In *T-Rex* (French, 2004, pp. 24–27), a child visiting a dinosaur exhibit is encouraged to pose questions about the life and times of Tyrannosaurus Rex:

Now, do you think he walked or ran? How do you think he found his food?
 Did he roar? Did he growl? Did he rumble and purr?
 How did he live and how did he die?
 Did he care for his babies or leave them alone?
 Maybe one day we'll really know. Maybe we'll know what's really true.
 The person to tell us might just be you.

In Conclusion

Scientifically based research and scientific inquiry can become vital components of school improvement efforts. Administrators can support it by encouraging teachers to become familiar with research studies and providing them with sufficient time to discuss and apply it. Teachers, organized into professional learning communities, can study, question, and reflect on proven methods of instruction and apply what they learn. And students, schooled in the methods of scientific inquiry in engaging and stimulating ways, can grow as thinking, questioning, and reflective learners.

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