



SCALE Key Concepts



This series of articles illustrates key concepts of the SCALE five year National Science Foundation-funded project.

The SCALE partnership aims to improve K-12 mathematics and science teaching and learning working with four urban school districts: Los Angeles Unified School District, Denver Public Schools, Madison Metropolitan School District, and Providence Public School District. Other partners include California State University, Dominguez Hills; California State University, Northridge and University of Wisconsin-Madison. These articles reflect the major themes of the National Science Foundation's Math and Science Partnership (MSP) Program: Partnerships Across Institutions; Challenging Courses and Curricula; Evidence-based Design and Outcomes; Teacher Quality, Quantity and Diversity; and Institutional Change and Sustainability.

Planting Seeds of Change: SCALE's Work with Higher Educational Institutions

One of the most gratifying tasks for SCALE partners has been putting all the pieces of the puzzle together so that everyone can finally see the picture. That emerging picture is one of professional partnerships working cohesively across the entire educational continuum. When you consider the historical context of education reform, the picture seems pretty amazing.

Traditionally, educators work independently of each other—K-12 teachers teach students, curriculum developers write curricula, professors prepare future teachers.

Not surprisingly, this model is not conducive to a lot of cooperation and trust between the parties over time. SCALE researchers report that misperceptions

among educators and science, technology, engineering and mathematics (STEM) faculty exist, and ultimately undermine K-20 partnerships and preservice and inservice instruction.

To remedy this, SCALE works with science and math faculty, curriculum experts, and K-12 educators and teachers to first develop a common understanding, or vision, of science and math teaching and learning. This is accomplished through

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focused group work where together all educators review the curriculum and standards, then develop a common agreement on the best methods for teaching and learning the material. Professional development sessions provide everyone with an opportunity to teach the material using an inquiry approach. Walking in someone else's shoes helps college faculty to better understand teachers, and teachers to better understand college faculty. SCALE researchers have noted that work on science immersion established a more collaborative and mutually enriching relationship between faculty and teachers.

An important "side effect" of college faculty involvement in immersion professional development is that the faculty also learn ways to improve their own teaching. STEM faculty traditionally have relied on content-rich lectures as the primary way to teach their students. Inquiry is a new way of teaching and learning for many faculty. As co-

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facilitators, faculty must learn how inquiry works in the classroom in order to model the techniques for K-12 teachers.

An assistant professor of earth sciences at California State University, Dominguez Hills, John Keyantash, participated in a science immersion

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institute two years ago and reported that he was influenced enough by the experience to change the way he teaches in his own college classroom:

“One of the big payoffs is that I’ve become more aware of what the education research shows for different ways to learn. [Regarding an inquiry-based approach,] I like to think of it as sort of turning a textbook on its head. I’ve tried to do that in my courses. I realized I could make lessons more dynamic... I do have a series of lessons that I changed for that reason... It takes a little bit of time to [revise course curriculum], but then I can sit back and say ‘yeah, that is better.’ [Even though



students may be unaware of the modifications,] I have a basis for comparison, I knew the difference,” he said. “I saw the Immersion unit approach and realized this engages people—it’s learning for all ages, learning for people.” — August 2007

For more information about the concepts and ideas discussed in this article, go to these links:

http://www.scalemsp.org/files/research/Reports/Hora_AERA_2007_paper.pdf

http://www.scalemsp.org/files/research/Products/Working_Paper_No_2007_02.pdf

SCALE is funded by the National Science Foundation Award #0227016. Any opinions, findings, or conclusions are those of the authors and do not necessarily reflect the views of the supporting agency. Copyright © 2007 The Board of Regents of the University of Wisconsin System



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