



# Model connects professional learning to student achievement

## Making Sense of the Links: Professional Development, Teacher Practices, and Student Achievement

Marjorie R. Wallace. *Teachers College Record*, 111(2), February 2009, pp. 573-596.

### OVERVIEW

This study describes a model that explains the relationships between professional development, certain teacher practices in mathematics and reading, and student achievement in those subjects. The study poses two research questions: “When teacher characteristics and teacher preparation program are controlled, what are the effects of teacher professional development on (1) teacher practices in mathematics and reading, and (2) subsequent student mathematics and reading achievement?” (p. 573).

### STUDY APPROACH

The samples of students nested within teachers were drawn from six existing databases, two from the 2000 Beginning Teacher Preparation Survey (BTPS) conducted in Connecticut and Tennessee, and four from the National Assessment of Educational Progress (NAEP Mathematics 1996, 2000, and NAEP Reading 1998, 2000). The research design, a hybrid structural equation model, was based on relationships indicated in the literature. Professional development was defined as a combination of mentoring experiences participating teachers received

and sessions they attended since completing formal teacher preparation.

### SELECTED FINDINGS

**Professional development effects can be linked to teacher practice and subsequent student mathematics and reading achievement.** The model showed that relationships could be described in a single model, and that professional development had very small but occasionally significant effects on average student achievement in mathematics and reading when mediated by teacher practice. A one-standard-deviation increase in professional development was consistently related to very small increases to average mathematics gains and achievement status at state and national levels. Professional development effects on reading gains and achievement mediated by teacher practice were close to zero with the exception of Connecticut, where a one-standard-deviation increase in teacher professional development raised student achievement about 11% over the course of one year.

**Most of the variance in teacher mathematics and reading practice was not accounted for by professional development.** The researcher speculated that the unexplained variance presents unmeasured teacher factors affecting classroom practice.

**Subject matter context makes a difference.** For the variables explained by the model, the effects of professional development in mathematics consistently translated into increased


effects on teacher practice and student achievement. With the exception of Connecticut, the results for reading were inconsistent.

### IMPLICATIONS FOR SYSTEM LEADERS

For states and systems to see predictive relationships among content standards, teacher preparation, and student achievement, they must invest time and resources in aligning professional development to support teacher practice and student learning.

The differences among subject areas examined in this study suggest that system leaders should ensure that professional learning is content-specific so that it aligns with the unique attributes and needs of each content and content-specific pedagogy.

Because variations in teacher practices not attributable to professional development were largely unexplained through this study, system leaders can carefully consider what other factors impact teacher practice and explore how to influence those factors to improve results for students.

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