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Preliminary Review of Research: Does Teacher Professional Development Affect Student Test Scores?

At the July 8, 2008, meeting of the Basic Education Finance Joint Task Force, Chair Dan Grimm directed Institute staff to summarize the research evidence on how teacher professional development affects student test scores.

Preliminary Review of Research

Thus far, we have located over 70 studies (see Appendix) that examine some aspect of professional development for teachers. Unfortunately, only three of these studies employ rigorous research methods to measure empirically whether professional development affects student test score outcomes. These three studies—from Florida, Chicago, and Israel, summarized below—are also the ones considered the most credible among the nation's top education researchers.[1] Thus, one basic finding from our review of the research is that the credible evidence is quite thin on this topic.

1. Florida. Harris and Sass (2008) evaluated in-service professional development for teachers statewide. This study is by far the most comprehensive and rigorous review of an entire state's professional development system. Using data for 983,000 Florida students in years 1999-2000 through 2004-05, the study examined the effectiveness of three kinds of teacher professional development:

a) in-service hours;
b) on-the-job training (experience); and
c) advanced degrees earned while teaching.

The following summary of the Harris and Sass findings focuses on their analysis of in-service training.[2]

The Florida data were sufficiently rich to allow the researchers to separate "content-oriented" in-service training from other, non-subject area specific in-service hours. During the study period, Florida teachers received, on average, 17 hours per year of content-specific in-service training and 30 hours per year of other in-service training. The Florida data also allowed Harris and Sass to examine test score effects by subject area (math and reading) and grade level (elementary, middle, and high school).

Table 1 displays our summary of the main findings from the Harris and Sass study. The authors found that in-service training had no impact on test scores, with the exception of a positive effect for content-specific professional development for middle school math teachers.

Table 1
Effect of Teacher In-Service Professional Development as Measured by Student Test Scores (Harris and Sass 2008)

	Content in-service hours		Other in-service hours	
	Math	Reading	Math	Reading
Elementary	n.s.	n.s.	n.s.	n.s.
Middle school	+	n.s.	n.s.	n.s.
High school	n.s.	n.s.	n.s.	n.s.

A "+" indicates a statistically significant, positive effect on test scores. "n.s." indicates a non-statistically significant effect.

Can the Florida results be generalized to Washington? Absent additional research comparing the content, format, and intensity of in-service training provided in Florida and Washington, answering this question is speculative. We recommend that Washington develop the data capacity so that a similarly well-done study can be performed.

[1] The Institute's consultant on this project, Dr. Dan Goldhaber, confirmed that these are the studies on professional development that have the strongest methodological design, and thus the most convincing findings.

[2] The Institute's December 2007 report to the Task Force summarized research findings on teacher experience and advanced degrees. This report included findings from an earlier version of this Harris and Sass paper.

2. Chicago. Jacob and Lefgren (2004) looked at the impact of teacher training on student achievement among low-performing schools in the Chicago public school system. The study used a strong research design, but only examined professional development in general, without distinguishing content-specific from other forms of teacher training. Using data for 100,000 elementary school students in 1997 through 1999, the authors found that, for both reading and math, professional development had no statistically significant relationship with student test scores.

Can the Chicago results be generalized to Washington? Again, we do not know how the two professional development systems compare. The Chicago study only examined low-performing, generally high-poverty schools, and therefore the findings may not apply to all schools.

3. Israel. Angrist and Lavy (2001) examined how teacher professional development affected the test scores of 848 Israeli elementary school students in 1994 through 1996. The study used several research designs, but, as in the Jacob and Lefgren Chicago study, did not distinguish content-specific from other forms of teacher training. Unlike the previous two studies, Angrist and Lavy found that teacher professional development had significantly positive effects on student reading and math test scores.

Can the Israel results be generalized to Washington? While the schools studied by Angrist and Lavy used a teacher training approach originally developed in the United States, we do not know how the Israeli educational system compares with Washington's schools. Thus, the degree to which the results from this small sample study can be applied to Washington State is unknown.

Next Steps

- Continue to search the literature for rigorous, empirical studies of how teacher professional development affects student academic outcomes.
- Formalize the review of rigorous study by conducting a meta-analysis (although, given the apparent paucity of rigorous studies that measure student test score outcomes, a meta-analysis may not be feasible for this topic).
- If a meta-analysis is possible, estimate the costs and benefits of providing additional professional development for Washington teachers.

Appendix: Research Citations

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