



Summary of “Estimating Teacher Impacts on Student Achievement: An Experimental Evaluation,” by Thomas J. Kane and Douglas O. Staiger. December 2008.

Introduction

In this study, Thomas J. Kane of the Harvard Graduate School of Education and Douglas O. Staiger of the Dartmouth College Department of Economics present their findings on teacher impacts on student achievement from an experimental evaluation. The authors used data from an experiment that randomly assigned teachers in the Los Angeles Unified School District (LAUSD) to determine the validity of methods that predict differences in test scores among classrooms of students randomly assigned to teachers.

First, the researchers found that estimation methods controlling for students’ prior year test scores and peer characteristics are best for predicting student achievement and can explain just over half of the variation in test scores that can be attributed to teachers. Conversely, the authors found that methods not controlling for prior year test scores and peer characteristics overestimate the actual difference in test scores and thus the teacher effect. Second, they found that students assigned to a classroom with a higher estimate of effectiveness scored higher on both math and reading tests at the end of the first year with their randomly assigned teacher. Third, they found that teacher effects “fade out” at roughly 50% each year for the first two years following teacher assignment. That is, after having a highly effective teacher for two years, only 25% of that teachers’ impact on their achievement remained.

Methods

The study was conducted over two school years (2003–04 and 2004–05) and aimed to examine differences in teacher effectiveness among teachers certified by the National Board for Professional Teaching Standards (NBPTS). Each teacher in LAUSD identified as being National Board certified was matched with a comparison teacher, and all teachers were then randomly assigned to classrooms. The authors calculated value-added scores for each teacher based on their performance over the past four years and tested the methods used to predict the value-added scores for bias and predictive accuracy. They also examined whether the effects of highly effective teachers persisted for student achievement one and two years later.

Implications and policy considerations

The authors’ conclude that teacher effects fade by roughly 50% each year for the first two years following teacher assignment. This fade-out has important implications for teacher evaluation models, particularly value-added estimators of teacher effectiveness. Value-added models aim to measure an individual teacher's impact on student achievement in a given year by comparing the test scores of their students in the current year to the scores those same students achieved the prior year. Many school districts have started to use value-added scores as part of a teacher’s evaluation, and value-added measures are becoming more widely used for making decisions about staffing and retention. A criticism of value-added models is that they treat measures of teacher effectiveness as time-invariant; that is, they assume that teacher effects persist over time.



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The findings in this study contradict that assumption and suggest that future models of value-added should account for this fade-out when estimating teacher impacts.

To understand this better, imagine that a particular third grade teacher is highly effective and helps their students to achieve gains at a higher rate than would be expected. The next year, students in this teachers' class disperse to other classrooms. If a student who had the highly effective teacher (Teacher A) the prior year and a student who had an ineffective teacher (Teacher B) the year before came into their new teacher's class at the same level, say, the 70th percentile in reading, the student who had teacher A would *underperform* relative to the student who had Teacher B. This is because only 50% of Teacher A's above-average effectiveness stayed with the student after they left Teacher A's class.

Value-added estimates may be more accurate in predicting teacher effects for the short-term, but the authors raise concerns about the use of value-added estimates for predicting long-term impacts. It is unclear why the fade-out occurs; they speculate that we observe the fade-out effect due to factors as yet unidentified. Examples could be changes in what is tested as students progress through the grades or in certain classes, even "teaching to the test".

For more information

Los Angeles Unified School District Research Unit:

http://notebook.lausd.net/portal/page?_pageid=33,127126&_dad=ptl&_schema=PTL_EP

Educational Testing Services – A Primer on Value-Added Models:

http://www.ets.org/research/policy_research_reports/pic-vam

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