Value-added modeling of teacher effectiveness: An exploration of stability across models and contexts

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Abstract

Recent policy interest in tying student learning to teacher evaluation has led to growing use of value-added methods for assessing student learning gains linked to individual teachers. VAM analyses rely on complex assumptions about the roles of schools, multiple teachers, student aptitudes and efforts, homes and families in producing measured student learning gains. This article reports on analyses that examine the stability of high school teacher effectiveness rankings across differing conditions. We find that judgments of teacher effectiveness for a given teacher can vary substantially across statistical models, classes taught, and years. Furthermore, student characteristics can impact teacher rankings, sometimes dramatically, even when such characteristics have been previously controlled statistically in the value-added model. A teacher who teaches less advantaged students in a given course or year typically receives lower effectiveness ratings than the same teacher teaching more advantaged students in a different course or year. Models that fail to take student demographics into account further disadvantage teachers serving large numbers of low-income, limited English proficient, or lower-tracked students. We examine a number of potential reasons for these findings, and we conclude that caution should be exercised in using student achievement gains and value-added methods to assess teachers’ effectiveness, especially when the stakes are high.

Keywords

teacher evaluation, value-added modeling, teacher effectiveness

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Research on Value-Added Models of Teacher “Effectiveness”. Researchers have developed value-added methods for looking at gains in student achievement by using statistical methods that allow them to measure changes in student scores over time, while taking into account student characteristics and other factors often found to influence achievement. In large-scale studies, these methods have proved valuable for looking at a range of factors affecting achievement and measuring the effects of programs or interventions. Most of these factors are not actually measured in value-added models, and the teacher’s effort and skill, while important, constitute a relatively small part of this complex equation. And how can we develop more effective teachers much more consistently, rather than leaving teacher effectiveness to chance? This report describes progress currently underway to achieve a system of reliable, valid, and nationally available performance assessments—from a teacher’s point of entry through the development of accomplished teaching. Economists Jonah Rockoff and Cecilia Speroni have similarly noted that “value-added measures of effectiveness are noisy and can be biased if some teachers are persistently given students that are harder to teach in ways that administrative data do not measure.” predictive of teacher effectiveness. This assessment is built upon the model designed by the California PACT consortium. Value-added models provide a classic example of a measure of teacher effectiveness driven by technological development. Using longitudinal linked teacher-student data, William Sanders was able to determine that students in some teachers’ classrooms were scoring higher than their previous test scores would have predicted (Sanders & Rivers, 1996). Sanders’ findings and his marketing of the technology to states for the purpose of evaluating schools and teachers have garnered considerable attention and contributed to the increased use of value-added methodologies. In addition to the objection