



RESEARCH BRIEF

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The Effect of Rigorous Teacher Evaluations on Workforce Quality Part 2: Teacher Exits and Student Achievement

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This brief is a follow-up to our previous brief on how the Effective Teachers Initiative (ETI) has changed the composition of teacher exits from HISD. The companion brief shows that the ETI has increased the exit rate of ineffective teachers relative to other teachers. This brief documents how much the compositional effect on exiting teachers improves student achievement. While we estimate a positive effect on achievement operating through the change in the composition of exiting teachers, it is very small. The reason is that even though the ETI has created a noticeable divergence in exit rates between low- and high-performing teachers, there are still many effective teachers who exit. Put differently, although teacher exit and retention are better aligned with student achievement goals under the ETI, they are not well enough aligned for the compositional change to induce meaningful achievement gains.

BACKGROUND

We study the introduction of the new teacher evaluation system at the Houston Independent School District (HISD). The new system is part of the Effective Teachers Initiative (ETI) at HISD that was initiated during the 2010-2011 school year. It was developed as part of a districtwide effort with input from various stakeholders, and teachers were first evaluated under the new system during the 2011-2012 school year.

Like other emerging systems (e.g., Washington DC and Tennessee), HISD teachers receive a “combined measure” rating that depends on an evaluation of various aspects of their performance.

Teachers’ ratings during the first year under the new system depended on evaluations of instructional practice and meeting professional expectations. In the second year, 2012-2013, student achievement metrics were formally incorporated into teachers’ overall ratings.

RESEARCH QUESTIONS

Our earlier brief reports findings from our investigation of how the ETI has influenced the quality-composition of exiting teachers. We show that low-performing teacher exit rates have increased significantly relative to middle- and high-performing teachers as a result of the introduction of the ETI.

In this brief, we ask how the compositional effect documented in the previous brief affects student achievement.

DATA AND METHODS

Data

We use a data panel with information on student achievement and teacher assignments covering the school years 2007-2008 through 2013-2014.

Measures

The dependent variable is school-by-grade average student achievement in mathematics, which matches the content of the teacher quality measures we have constructed based on teachers' EVAAS® scores in math, as described in the previous brief.

The key independent variables are measures of teacher turnover at the school-by-grade level. In particular, we use measures of total turnover and turnover by teacher quality group. The quality groups are high-performing (top quintile), middle-performing (middle three quintiles), and low-performing (bottom quintile).¹

Analytic Strategy

We estimate a regression model of changes in student achievement across cohorts at the school-by-grade level on changes in exposure to teacher turnover and turnover-by-quality. The model is

¹ For completeness, in the academic article we also include a group of teachers with "unknown" quality. The unknown group consists of teachers for whom we cannot construct quality measures using the procedure outlined in the article; essentially teachers who had not taught mathematics in grades 3-8 previously. However, the inclusion of these teachers in the model is not critical to the content of this brief.

similar to the model estimated by Adnot et al. (2016) except that we control not only for the level of teacher turnover across cohorts by quality, which captures changes in the composition of teachers, but also for changes in exposure to turnover, which captures differential disruption.

Estimates from the model provide an indication of the achievement effect of turnover for teachers who differ by quality. We combine these estimates with the analysis described in the companion brief, which documents how turnover patterns by quality have changed with the introduction of the ETI (see Figure 1 below), to estimate a per-turnover effect of the ETI on student achievement operating through the selective-attrition mechanism.

RESULTS

When we estimate the model of student achievement, we find that exits of low-performing, middle-performing, and high-performing teachers – identified using our measures of quality – associate with changes in student achievement of 0.17, 0.07, and -0.17 standard deviations on the state assessment in mathematics. Reassuringly, these changes align closely with the simple averages of our quality measures across groups, which are -0.13, 0.01, and 0.18, respectively. The gap between low- and high-performing teachers implies that differences in teacher quality at HISD are large.

Figure 1 uses model-based estimates from our academic article, based on the results presented in the previous brief, to estimate the effect of the ETI on the quality-composition of district exiters. It shows the pre- and post-ETI shares of exiters from each teacher-quality group. Consistent with what is reported in the

previous brief, Figure 1 illustrates a clear shift toward lower-quality teacher exits. Specifically, we estimate that the share of exiters from the bottom quintile of the teacher quality distribution rose from 25 to 30 percent from the pre- to post-ETI periods.

We combine the information from the student-achievement model described in the first paragraph of this section with the compositional-effect estimates in Figure 1. This allows us to estimate the per-turnover effect of the compositional change in exits on student achievement. The per-turnover effect is a weighted average of the achievement effect of each type of exit, where the weight is the change in the share of that type of exit from the pre- to post-ETI periods.

Our calculations indicate that the expected average change in achievement *per district exit* increases very little from the pre- to post-policy period – just 0.005 student standard deviations – owing to the compositional change in exiters. The reason is that although exits are better aligned with teacher quality in the post-ETI period, there are still too many exits by middle- and top-performing teachers for the net effect on achievement to be meaningful.

DISCUSSION

The ETI has noticeably affected the quality-composition of exiting teachers – significantly more ineffective teachers are leaving HISD than before the policy was implemented. While this finding highlights the potential for targeted turnover to improve workforce quality, this brief shows that exit rates for moderately and highly effective teachers remain sufficiently high such that the total

achievement effect, at least operating through the selective attrition margin, has been limited.

We recognize that there are other ways that the ETI is designed to improve instruction and student outcomes about which our work thus far has been silent – notably via recruitment and greater improvement among incumbent teachers – but on the dimension of selective attrition, the compositional effects have simply not been large enough to measurably improve student achievement. Future work will consider the other dimensions of potential policy impact.

REFERENCES

Adnot, Melinda, Thomas Dee, Veronica Katz, and James Wyckoff. 2016. Teacher Turnover, Teacher Quality, and Student Achievement in DCPS. NBER Working Paper No. 21922.

This is an abbreviated version of a much longer research study that is being written for peer review. For additional information on the findings presented here, or to obtain the full peer-review version of the research contained in this brief when it becomes available, contact the Houston Education Research Consortium at 713-348-2802 or email here@rice.edu.

Figure 1. Model-based estimates of the proportions of teachers who exit the district by quality-quintile group in the pre- and post-ETI periods, taking the pre- and post-policy total exit rates from HISD as given.



Black: Bottom-quintile teachers
Clear: Middle-quintiles teachers (quintiles 2-3-4)
Gray: Top-quintile teachers