The Narrowing Gap in New York City Teacher Qualifications and Implications for Student Achievement in High-Poverty Schools

DON BOYD, HAMP LANKFORD, SUSANNA LOEB, JONAH ROCKOFF, AND JIM WYCKOFF

RESEARCH QUESTIONS

Arguably the most important educational resource is teachers. Teachers and teaching quality are a central feature of the No Child Left Behind Act of 2001 (NCLB) which requires a "highly qualified teacher" in every core academic classroom. Many states and large districts also have policies in place to attract qualified teachers to difficult-to-staff schools. NCLB, state assessment-based accountability policies and new routes into teaching have all had profound effects on the labor market for teachers. In this research, we explore the effect of these changes on the distribution of teacher qualifications and student achievement. Employing data from New York City, we examine three questions:

1. How has the distribution of teaching qualifications between schools with concentrations of poor students and those with more affluent students changed between 2000 and 2005?

2. What effects are the changes in observed teacher qualifications likely to have on student achievement? and

3. What implications do these findings have for improving policies and programs aimed at recruiting highly effective teachers?

DATA AND METHODS

Our analysis employs individual student and teacher-level data for grades 3 through 8 for each year from 2000 through 2005. The analysis of the changing distribution of teacher

qualifications aggregates these data to the school level and categorizes schools by the poverty status of their students. The results presented are insensitive to various categorizations of school poverty. We also examine the distribution of teacher qualifications by the racial and achievement composition of schools. The statistical analysis of the effects of teacher qualifications on student achievement uses individual student achievement gains obtained by observing student achievement in math and English language arts over time. These estimates control for a variety of student, class, and school characteristics. The main findings are insensitive to a variety of model specifications.

TEACHER SORTING IN NEW YORK CITY

This research employs several measures to characterize the qualifications of teachers, including teaching experience, performance on state teacher certification exams, certification status and area, competitiveness of a teacher's undergraduate institution, pathway into teaching, and SAT scores. We analyze the distribution of teacher qualifications by the poverty status of students in the schools where these teachers work. By these measures, the distribution of teachers in 2000 was very unequal. Figure 1 shows that high-poverty schools were far more likely to have teachers who failed the state certification exam the first time they took it. Thirty-five percent of teachers in schools in the highest poverty quartile failed the exam compared with only 15 percent in the lowest poverty quartile. In 2000, teachers in the highest poverty quartile were also much more likely to have fewer than three years teaching experience,

to have graduated from the least competitive colleges, and to have much lower scores on SAT exams than did teachers in lower-poverty schools.

FIGURE 1. PERCENT OF ALL NEW YORK CITY TEACHERS WHO FAILED THE LAST EXAM ON FIRST TAKING BY POVERTY QUARTILE OF SCHOOL'S STUDENTS, 2000–2005
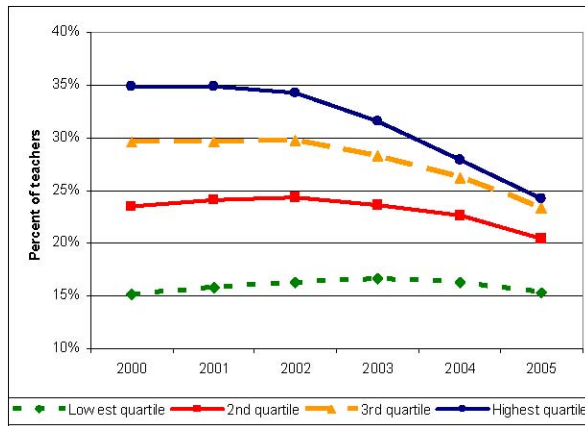
However, between 2000 and 2005, there was a remarkable narrowing in the gap in teacher qualifications between higher- and lower-poverty schools. In particular, the higher-poverty schools improved considerably while the lower-poverty schools either did not improve or did so only slightly. As is evident in figure 1, less than 25 percent of teachers in the highest poverty quartile failed the LAST (the New York general knowledge certification exam) on the first attempt by 2005, while the lowest poverty quartile actually remained constant, so the gap narrowed by 10 percentage points or half its level five years earlier. The same basic pattern holds with other teacher qualifications, including verbal and math SAT scores, the percentage who attended least competitive colleges, and to a lesser extent the proportion of novice teachers. In general, the gap between the lowest and highest poverty schools narrows as a result of substantial improvements in the highest poverty schools. We find the same pattern of wide disparities in teacher qualifications in 2000 that significantly narrow by 2005 if schools are grouped by the proportion of their students who are black or Hispanic or if grouped by their academic achievement level. We also find similar trends in teacher qualifications across schools by grade levels; however, elementary schools experienced

the greatest narrowing in the teacher qualifications gap.

POLICY IMPROVED TEACHER QUALIFICATIONS

The dramatic reductions in the teacher-qualifications gap are driven primarily by changes in the qualifications of newly hired teachers, and the ways in which they vary with the poverty status of schools. Figure 2 shows that the average failure rate on the LAST exam of newly hired teachers converged between 2000 and 2003, so from 2003 forward the failure rate was about the same across poverty categories of schools. A similar convergence occurs for SAT scores, but not for the competitiveness of colleges attended by teachers.

FIGURE 2. LAST EXAM FAILURE RATE OF NEW TEACHERS BY POVERTY QUARTILE

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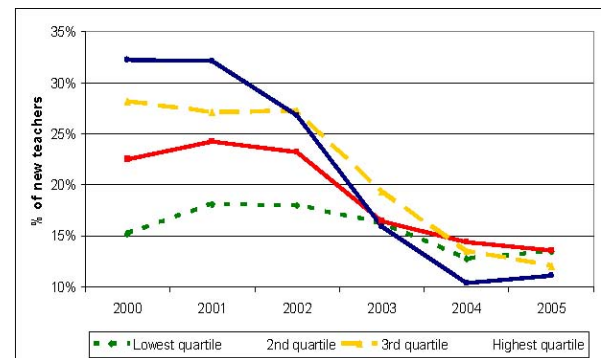
The pattern of improving and converging qualifications of new teachers results primarily from three policy changes: (1) the New York State Board of Regents effectively abolished temporary licenses for uncertified teachers effective September 1, 2003; (2) in 2000, the Regents created alternative certification routes; and (3) the New York City Department of Education developed the Teaching Fellows program. The first Fellows cohort began teaching in 2001; by 2005, they constituted 33 percent of all new teachers. Over the same period, temporarily licensed teachers fell from 53 percent of new hires to 3 percent.

The shift in the entry pathway of teachers has had a large impact on the distribution of teacher qualifications for two reasons. First, Teaching Fellows and Teach for America (TFA) teachers on average have test scores and prior academic experiences that are stronger than those of other teachers and much stronger than those of

temporarily licensed teachers. Second, newly hired Teaching Fellows and TFA teachers are placed disproportionately in high-poverty schools, as were their temporarily licensed predecessors. By 2005, 40 percent of all new hires in the highest poverty quartile were Teaching Fellows or TFA corps members.
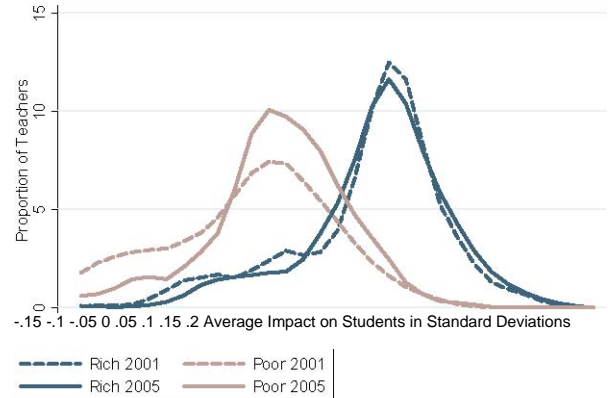
TEACHER QUALIFICATIONS AND STUDENT ACHIEVEMENT

Over the same period in which the gap in teacher qualifications narrowed, the gap in the proportion of students failing to meet proficiency standards also narrowed. In general achievement in high-poverty schools has improved and come closer to that of low-poverty schools, although in some cases the changes are not large. To explore the relationship between improvements in qualifications and student achievement we estimate statistical models of individual student gains in achievement in math and English Language Arts that allow us to isolate the effects of teacher qualifications on student achievement gains or value added.

Although some of the individual teacher qualifications affect student outcomes in important ways, often the effects are relatively small in magnitude compared with the variation in student learning over a school year. However, the rather substantial changes in teacher qualifications in the poorest schools during the 2000 to 2005 period occurred not just for one measure of teacher attributes but across a variety of measures. We use our statistical model to predict the effect of all teacher qualifications on student achievement gains for 4th and 5th grade math students in the poorest and least-poor deciles of schools in 2000 and 2005. As shown in figure 3, the improved qualifications of teachers in the poorest decile improve student achievement gains between 2000 and 2005. On average, improvement is about half the size of the improvement a student would experience if taught by a second year teacher rather than a first year teacher—an effect generally recognized as meaningful.

As noted above, the change in teacher sorting has been driven almost exclusively by new teachers. The prior analyses predict

FIGURE 3. EFFECT OF OBSERVED TEACHER QUALIFICATIONS ON STUDENTS IN GRADES 4 AND 5 MATH ACHIEVEMENT, MOST AFFLUENT AND POOREST DECILES OF SCHOOLS, 2001 AND 2005

student achievement based on the full sample of teachers. If only teachers in their first or second year are used to examine the effects of teacher qualifications on student achievement the students, the effects are about two-thirds of the gain estimated to accrue to teachers after their first year of teaching.

What additional gains might result from recruiting teachers with strong qualifications? As is apparent in any of the achievement distributions in figure 3, there are meaningful achievement differences between higher- and lower-performing teachers solely attributable to observed teacher qualifications. To explore the potential for increased student achievement from recruiting teachers with stronger qualifications, we examine 4th and 5th grade teachers in the quartile of schools with the highest rates of student poverty. The difference between the average value added attributable solely to teacher qualifications for those teachers in the top and bottom quintiles of this distribution is 0.16—roughly three times the effect of the gains attributable to the first year of teacher experience. There are important differences in qualifications between teachers who produce the highest and lowest value added students. Those with the weakest value added tend to be inexperienced, have failed the LAST certification exam the first time they took it, be uncertified at the time they teach the class, and have low math SAT scores.

SUMMARY

We draw four primary conclusions from this analysis.

1. The gap between the qualifications of New York City teachers in high-poverty schools and low-poverty schools has narrowed substantially between 2000 and 2005. Most of this gap-narrowing resulted from improvement in the qualifications of newly hired teachers in high-poverty schools, rather than from differences in quits and transfers between high- and low-poverty schools.

2. The gap-narrowing associated with new hires has been driven almost entirely by the substitution of academically qualified teachers, hired through the NYC Teaching Fellows and Teach for America alternative certification routes, for uncertified teachers in high-poverty schools.

3. These changes resulted from a direct policy intervention that changed the qualifications of the teachers of poor, minority and low achieving students in New York City. The sorting of the least qualified teachers to the students most in need of better teachers is not destiny, but it requires forceful action by policymakers and a commitment by local hiring authorities to attract more highly qualified teachers.

4. Perhaps most intriguing, much larger gains could result if teachers with strong teacher qualifications could be recruited.

Producing better student achievement likely results from several complementary strategies. Clearly a large proportion of the variation in teacher effectiveness at improving student achievement is not related to teacher characteristics that are easily observed such as test scores or certification status. Because of this, policies that enable school leaders to better understand the strengths and weaknesses of each teacher so they can target professional development and effectively utilize the due-process system to continually improve the teacher workforce are likely to be important. However, this paper suggests that selection of teachers with stronger qualifications has made an important difference in New York City public schools and that recruitment and retention of teachers with stronger measurable characteristics can lead to improved student learning.

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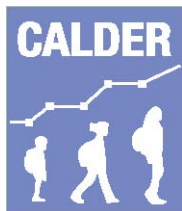# of Longitudinal Data
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