

# The Challenges of Staffing Urban Schools with Effective Teachers

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## Summary

Brian Jacob examines challenges faced by urban districts in staffing their schools with effective teachers. He emphasizes that the problem is far from uniform. Teacher shortages are more severe in certain subjects and grades than others, and differ dramatically from one school to another. The Chicago public schools, for example, regularly receive roughly ten applicants for each teaching position. But many applicants are interested in specific schools, and district officials struggle to find candidates for highly impoverished schools.

Urban districts' difficulty in attracting and hiring teachers, says Jacob, means that urban teachers are less highly qualified than their suburban counterparts with respect to characteristics such as experience, educational background, and teaching certification. But they may not thus be less effective teachers. Jacob cites recent studies that have found that many teacher characteristics bear surprisingly little relationship to student outcomes. Policies to enhance teacher quality must thus be evaluated in terms of their effect on student achievement, not in terms of conventional teacher characteristics.

Jacob then discusses how supply and demand contribute to urban teacher shortages. Supply factors involve wages, working conditions, and geographic proximity between teacher candidates and schools. Urban districts have tried various strategies to increase the supply of teacher candidates (including salary increases and targeted bonuses) and to improve retention rates (including mentoring programs). But there is little rigorous research evidence on the effectiveness of these strategies.

Demand also has a role in urban teacher shortages. Administrators in urban schools may not recognize or value high-quality teachers. Human resource departments restrict district officials from making job offers until late in the hiring season, after many candidates have accepted positions elsewhere. Jacob argues that urban districts must improve hiring practices and also reevaluate policies for teacher tenure so that ineffective teachers can be dismissed.

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Schools serving inner-city students face the challenge of preparing children from disadvantaged neighborhoods to be productive citizens. The task, always difficult, is more daunting today than ever. Although the United States has made important economic progress over the past half century, many of the nation's children remain impoverished. In 2004, according to the Census Bureau, 13 million American children under age eighteen lived in poverty—an overall child poverty rate of 17.8 percent. Perhaps more important, structural changes in the economy have dramatically raised expectations for public schools over the past several decades. Although it was once possible for adults to earn a productive living with only rudimentary academic skills, recent technological advances have made it increasingly difficult for those with anything less than a college degree to find a job that offers a living wage.<sup>1</sup> Today even manufacturing and other blue-collar jobs require knowledge of algebra, as well as sophisticated reading comprehension and problem-solving skills. In this new environment, schools are being asked to provide all students an education once enjoyed by only a select few.

Teachers play a critical role in schooling, particularly in inner-city school districts where children often have less support at home. But central-city districts often have difficulty finding qualified teachers. According to federal statistics in the Schools and Staffing Survey (SASS), 34.7 percent of central city schools had difficulty hiring a math teacher, compared with only 25.1 percent of suburban schools.<sup>2</sup>

In this article I examine the challenges that urban districts face in staffing their schools with effective teachers. First, I provide a de-

tailed look at urban schools and school districts, highlighting some of the important ways in which urban districts differ from both wealthier suburban districts and high-poverty rural districts. Next, I describe the staffing difficulties encountered by urban schools, noting in particular that teachers in urban districts are less highly qualified than their suburban counterparts with respect to criteria such as experience, educational background, and teaching certification. I then review evidence on teacher effectiveness, exploring whether highly qualified teachers are the most effective at promoting student learning. After examining why it is hard for urban districts to staff their schools, I discuss policy options for raising the quality of the teacher workforce in urban areas and assess the evidence on each option.

## A Portrait of Urban Districts and Schools

What is an urban school? For many Americans, the term *urban school* evokes an image of a dilapidated school building in a poor inner-city neighborhood populated with African American or Hispanic children. How accurate is that image? By definition, of course, urban schools are located in large central cities. But although these communities are often characterized by high rates of poverty, poverty itself is not unique to urban areas and can be found, in particular, in many schools in the nation's rural areas. In this section I highlight key features of urban schools and school districts that distinguish them from both rural and suburban districts. I then show how those features contribute to the staffing challenges faced by these districts.

The statistics shown in table 1 present a detailed portrait of urban schools and communities. Unless otherwise noted, the data are drawn from the Schools and Staffing Survey

**Table 1. Students and Schools in Urban and Suburban Districts and in All Public Schools**

Percent unless otherwise specified

Characteristic	All public schools	Central city	Suburban
<i>Students</i>			
Share African American	16.8	28.4	12.3
Share Hispanic	17.7	28.9	14.6
Share minority	39.7	64.0	31.8
Share receiving Title I services	27.5	40.4	19.7
Share participating in free or reduced-price lunch program	41.6	56.4	32.1
Share special education	12.8	12.9	12.6
Share limited English proficient	10.8	17.3	8.2
Share of 4th graders scoring proficient or advanced on NAEP math	32	27	36
Share of 4th graders scoring proficient or advanced on NAEP reading	30	22	33
Share of schools where > 90 percent of 12th graders graduated	73.0	55.0	73.2
<i>Community</i>			
Poverty rate	9.2	13.6	6.0
Employment rate	5.8	7.5	4.6
Violent crime rate per 100,000 inhabitants	466	506	377
Property crime rate per 100,000 inhabitants	3,517	3,697	4,110
<i>School and district</i>			
Number of students enrolled in public schools	47,315,700	13,972,000	24,915,800
Average number of students per school	537	636	589
Average number of students per district	...	9,980	3,664
Share of all children attending private schools	9.7	13.0	9.2
Average number of teachers not renewed or dismissed	3.1	12.4	3.0
Average share of teachers dismissed	...	1.4	1.2
<i>School resources</i>			
Per pupil expenditures, 2000–01 (dollars)	7,268	7,812	7,542
Average number of students per teacher	14.6	15.0	14.6
Average regular, full-time teacher salary (dollars)	44,400	45,400	46,100
Share of schools with temporary buildings	31.7	37.7	34.4
Share of schools that routinely used common areas for instructional purposes	19.2	21.3	19.0
Share of schools in which some teachers did not have their own classrooms because of lack of space	26.7	27.9	29.1
Share of schools with a library media center	93.7	92.9	94.1
Share of media libraries with computer access	92.7	92.3	94.5
Average number of workstations with Internet access in media libraries	13.1	13	14.2

Notes: Unless noted below, all statistics come from the 2003–04 Schools and Staffing Survey and were drawn from National Center for Education Statistics, “Characteristics of Schools, Districts, Teachers, Principals, and School Libraries in the United States, 2003–04, Schools and Staffing Survey,” Report 2006-313 (U.S. Department of Education, 2006). The data in column 1 include all public schools; columns 2 and 3 refer, respectively, to schools in central cities and schools on the urban fringes of central cities (including large towns). Blank cells indicate that the relevant statistic was not available.

Data from the National Assessment of Educational Progress (NAEP) are for 2003 and were obtained from the DataExplorer tool on the website of the National Center for Education Statistics, [www.nces.ed.gov/nationsreportcard/nde/](http://www.nces.ed.gov/nationsreportcard/nde/). Column 1 includes data for all public schools; columns 2 and 3 refer, respectively, to schools in central cities and schools in the urban fringe of central cities.

Crime rate data are for 2004 and were drawn from the Uniform Crime Reports produced by the Federal Bureau of Investigation, as contained in the table found at [www.fbi.gov/ucr/cius\\_04/offenses\\_reported/offense\\_tabulations/table\\_02.html](http://www.fbi.gov/ucr/cius_04/offenses_reported/offense_tabulations/table_02.html). The data in column 1 refer to the entire United States; columns 2 and 3 refer, respectively, to rates for metropolitan statistical areas (MSAs) and cities outside MSAs. Per pupil expenditure data come from the Condition of Education report published by the Department of Education, accessed at <http://nces.ed.gov/programs/coe/2004/section4/table.asp?tableID=91> (August 22, 2006).

Poverty and employment rates come from the 2000 Census, accessed using the American FactFinder data tool on the U.S. Census Bureau website. The figures in column 1 refer to the entire United States; figures in columns 2 and 3 refer, respectively, to central city areas in MSAs and non-central-city areas in MSAs.

of 2003–04, a nationally representative survey administered by the Department of Education. The top panel confirms that urban districts do indeed have high shares of poor and minority students. Roughly 64 percent of students in central cities are minority, as against only 32 percent in areas on the urban fringe or large towns (hereafter I will refer to these areas as suburbs). Similarly, 56 percent of students in central cities participate in free

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lunch programs and 40 percent receive services under Title I of the Elementary and Secondary Education Act of 1965 (federal funds earmarked for poor children), compared with 32 and 20 percent, respectively, in suburbs. On average, urban students score lower on standardized achievement exams than their suburban counterparts. For example, only 17 percent of fourth graders in central cities scored at the proficient level on the National Assessment of Educational Progress (NAEP) math exam, compared with 27 percent in suburban schools.

Poverty, as noted, is a feature of rural districts as well as urban districts. So is low student achievement. And urban schools resemble rural schools—and differ from suburban

schools—in two other respects. First, like some of the nation’s rural schools (see the article by David Monk in this volume), urban schools educate many of the nation’s immigrant children, for whom English is a second language. The share of students classified as limited English proficient is twice as high in central cities as it is in suburbs (17.3 versus 8.2 percent). Indeed, many large U.S. cities educate children from dozens (or even hundreds) of different nations. In New York City schools, for example, students speak more than 120 languages.<sup>3</sup> This rich array of languages makes it harder for schools to communicate with parents and also limits districts’ ability to offer any home language instruction (whether full-blown bilingual education or simply periodic assistance in the home language) to many of their students. Again like students in rural schools in some areas of the nation, students in urban schools tend to have extremely high rates of mobility.<sup>4</sup> And when teachers are forced to adjust to accommodate an ever-changing set of students, this high mobility becomes disruptive not only for the “movers” but also for stable students.

The portrait of central cities drawn by the table is rather bleak: rates of unemployment, poverty, and crime are all high. The jobless rate in urban areas, for example, averaged 7.5 percent, as against 4.6 percent in the suburbs. And the rate of violent crime per 100,000 inhabitants was 506 in urban areas, compared with 377 in the suburbs (and only 202 in non-metropolitan counties). Beyond tangible measures of disadvantage such as poverty or crime, some researchers have also argued that many inner-city neighborhoods suffer from poor “social capital”—the informal connections between people that help a community monitor its children, provide positive role models, and give support to those in need.<sup>5</sup>

Urban and suburban schools also differ from each other in terms of the resources available to students and teachers, although the many compensatory state and federal programs reduce the size of the disparities. Indeed, per pupil expenditures were higher in cities than in the suburbs—\$7,812 compared with \$7,542, according to the 2004 SASS data. Such aggregate statistics, however, likely mask the extent of the disparities because they do not account for regional differences in the cost of living. They also fail to distinguish between the most and least under-resourced urban schools.

Many urban districts must contend with an eroding tax base, which makes them unusually dependent on state and federal funding. That reliance on outside actors further constrains urban districts. With the cost of living often higher in urban than in suburban and rural areas, urban school districts may have a harder time attracting workers, whether teachers or maintenance workers, than would private sector employers, who may be better able to adjust wages accordingly.

Differences in other “tangible” resources are small. For example, roughly 38 percent of urban schools were using temporary buildings, compared with 34 percent of suburban schools, and fewer teachers in urban schools reported that they did not have their own classrooms because of lack of space. More than 90 percent of schools in both types of districts reported having a library media center and computer workstations with Internet access.

Finally, urban districts are much larger than their suburban or rural counterparts. In some respects, that large size may be an advantage. For example, large urban districts might be able to negotiate better rates with suppliers

(of computers or telephones, for example) and can mount large-scale recruiting efforts that would be impossible for districts that hire only a handful of teachers each year. Districts like New York City and Chicago, for example, recruit not only nationwide but from foreign countries as well. But the large size of many urban districts may also entail disadvantages. Large districts are more likely to have complicated bureaucratic systems that prevent them from acting quickly and decisively. They also tend to face strong and well-organized teacher unions, which limit the authority of district leaders.

The size difference also affects competition between schools. The economist Caroline Hoxby has argued that competition between school districts (generally suburban districts) leads schools in these districts to become more efficient, since they must satisfy demanding parents or risk falling enrollments.<sup>6</sup> As Hoxby sees it, the key to such competition is that families in many suburban areas can easily move from one suburban district to another. Although other researchers have criticized Hoxby’s analysis, it is certainly true that, at least in theory, there may be important benefits of competition between schools.<sup>7</sup> Hence, it is important to understand the type and extent of competition that urban districts face. Urban districts do not face serious competition from each other (though they do face competition from suburban districts).<sup>8</sup> But urban school districts face considerably more competition from private schools than do suburban or rural districts. Statistics from the SASS indicate that roughly 13 percent of children in central cities attend private schools, compared with only 9 percent in suburbs. Of course, one reason for that discrepancy may be that parents are dissatisfied with urban school education. But the high population density in cities

makes private schools more cost-effective to operate, thus increasing the potential supply of private schools.

### The Nature and Extent of Staffing Difficulties in Urban Schools

The problem that urban districts face in staffing their schools is often couched in terms of a teacher “shortage.” But exactly what kind of shortage is it when virtually all classes eventually end up with some sort of teacher? It is helpful to consider the problem in terms an economist would use: a shortage occurs when demand exceeds supply. In the case of an urban school district, a teacher shortage means that the number of effective teachers the district wants to employ is greater than the number of effective teachers who are willing and able to work at a given salary. Districts respond to such shortages in a variety of ways: by hiring teachers with no certification or experience, by using long-term substitutes, or by increasing class sizes.

In practice, therefore, a teacher shortage in urban districts makes it hard to hire qualified teachers—so that the teachers who are hired are often less qualified than teachers in suburban districts. Table 2 presents some statistics from the 2004 SASS that illustrate the particular kind of hiring difficulties faced by urban districts. Roughly the same share of urban and suburban schools had at least one teaching vacancy, but urban schools were much more likely to have vacancies in critical areas such as math and science. Moreover, urban schools were substantially more likely to fill these vacancies by hiring a substitute (42.4 percent versus 30.0 percent) or hiring a less than fully qualified teacher (19.2 percent versus 14.4 percent).<sup>9</sup>

Teacher shortages in urban districts, however, are not uniform in nature and extent.

**Table 2. Staffing Difficulties in Urban and Suburban Districts**

Percent		
Difficulty	Urban	Suburban
Share of schools with teacher vacancy in any area	75.4	76.9
Of schools with vacancy in given area, share with difficulty hiring		
General elementary	5.7	2.9
Special education	31.0	26.6
Math	34.7	25.1
Biology or life sciences	27.2	17.4
ESL	27.9	30.0
Of schools with vacancy, share that filled position in different ways		
Short- or long-term substitute	42.4	30.0
Less than fully qualified teacher	19.2	14.4

Source: NCES, “Characteristics of Schools, Districts, Teachers, Principals, and School Libraries in the United States, 2003–04, Schools and Staffing Survey,” Report 2006-313 (U.S. Department of Education, 2006), table 16.

For example, shortages are greater in certain subjects and grades—most notably, secondary math and science and bilingual and special education at all levels. And the supply of teacher applicants in urban districts often differs dramatically from one school to another. The Chicago public schools, for example, regularly receive roughly ten applicants for each teaching position.<sup>10</sup> But many of these applicants are interested in particular, highly desirable schools, and district officials must struggle to find good candidates for some highly impoverished or dysfunctional schools. Similarly, in 2004–05 the New York City Teaching Fellows Program, an alternative certification program that places mid-career professionals into teaching jobs, received more than 17,500 applicants for 2,000 positions.<sup>11</sup> And a case study of four urban districts by the New Teacher Project found bureaucratic hurdles to be at least as significant as a shortage of people who show initial interest in working there.<sup>12</sup>

Given urban districts' difficulty in hiring, it is not surprising that urban teachers tend to be less experienced and to have fewer of certain conventional credentials than those in suburban districts. According to the SASS, 20.3 percent of teachers in urban districts had three or fewer years of experience, compared with 17.6 percent in suburban districts. Urban teachers also are less likely to stay at the same school for an extended period, with 52.4 percent (compared with 57.1 percent of suburban teachers) reporting having taught at the same school for four or more years. In addition, the 2003–04 SASS reports that urban teachers are slightly less likely than suburban teachers to have an MA degree (40.3 percent, compared with 42.9 percent).<sup>13</sup>

Indeed, many studies have found that teachers in schools serving poor and minority children in large cities are more likely to be inexperienced, less likely to be certified, and less likely to have graduated from competitive colleges than are suburban teachers. They also score lower on standardized exams and are more likely to be teaching subjects for which they are not certified.<sup>14</sup> A recent study of schools in New York State using exceptionally rich data concludes that teacher qualifications vary considerably across schools and are strongly correlated with student race and income.<sup>15</sup> For example, in some schools more than 30 percent of teachers failed the certification exam, while at other schools no teachers failed.<sup>16</sup> Some 21 percent of nonwhite students' teachers failed the certification exam compared with 7 percent of white students' teachers.

The authors found similar patterns even within New York City public schools. Teachers of poor and minority children were more likely to be less experienced, less likely to have graduated from competitive colleges,

and more likely to have failed the certification exam than teachers in other public schools in the same district. Researchers analyzing a detailed administrative data set of teachers in North Carolina came to similar conclusions. One report found that African American students are more likely to be taught by novice teachers.<sup>17</sup> Another found that even *within* schools, more highly qualified teachers (as measured by the competitiveness of their undergraduate institution, by advanced degrees, by experience, and by scores on the state licensure test) tend to teach more advantaged children.<sup>18</sup> Within the same school, for example, *prior* achievement test scores of students whose teacher scored in the bottom third on the state licensure exam were roughly 0.1 standard deviation lower than those of students whose teachers scored in the top third of the exam.

Another useful metric of quality, particularly for secondary schools, is the share of teachers who are teaching subjects for which they are not certified, a practice known as “out-of-field” teaching. According to data from the SASS, roughly one-third of all seventh- to twelfth-grade teachers had neither a major nor a minor in the field in which they taught.<sup>19</sup> Shares were considerably larger for math, life sciences, and physical sciences, where 36, 43, and 59 percent of teachers, respectively, were teaching out of field. Patterns were even more pronounced in high-poverty schools, where the share teaching out of field was 51 percent in math and 64 percent in physical sciences.

### Recruitment or Retention?

Clearly teachers in urban schools are less qualified than those in more affluent areas, at least along many easily observable dimensions. But is the lower quality of urban teachers primarily a result of problems in recruit-

ment or in retention? It could be that highly qualified teachers are equally likely to start out at urban and suburban schools, but that high-quality urban teachers are more likely to change schools or leave the profession.

In fact, problems in both recruitment and retention contribute to disparities in teacher characteristics. Recent studies of teachers in

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New York State found that first-year teachers in suburban and more advantaged urban schools were more highly qualified (that is, from more competitive colleges and less likely to fail the certification exam) than those in urban schools more generally. At the same time, attrition was considerably higher in schools and districts with higher rates of poverty and shares of minority students. In 2000, for example, teacher turnover was 15 percent in all public schools, compared with 22 percent in high-poverty urban schools.<sup>20</sup> Moreover, the teachers who tended to leave urban schools were more highly qualified than those who remained. A study of New York State teachers that tracked for five years the cohort who began teaching in 1993 found that teachers who transferred from one district to another and teachers who left the pro-

fession were less likely to have failed the certification exam and more likely to have graduated from a competitive college than those who remained in the same school.<sup>21</sup>

But a recent study of a large Texas district found that teachers who changed schools or left the district, or both, did *not* have lower measures of “value added” (improvements in student test scores attributable to a particular teacher) than those who remained in their school, although the departing teachers were less qualified on some other dimensions.<sup>22</sup> Although no single study should be considered definitive, this finding reinforces the need for caution in relying on teacher characteristics as a proxy for teacher effectiveness. While teachers who themselves have stronger academic backgrounds are more likely to leave the lowest-performing schools, it is not clear that these are actually the better teachers. It is possible to say definitively only that teacher attrition rates are higher in these schools.

Teacher attrition imposes costs not only on the students of the novice teacher who replaces the outgoing teacher but also on the school as a whole. For example, administrators and perhaps even other teachers must take time to orient and train new teachers, particularly if the school uses a particular curriculum. To the extent that principals adjust class sizes or the student composition of classes to provide new teachers with a somewhat easier load, other teachers in the school will necessarily shoulder a heavier burden. More generally, a staff with high turnover loses the institutional memory that could help it avoid “reinventing the wheel” or making costly mistakes.

### **Has NCLB Changed Anything?**

The federal No Child Left Behind (NCLB) Act of 2001 established a series of accounta-



bility measures for schools. One, aimed at improving teacher quality nationwide, required each school district to certify, by the 2005–06 school year, that all core subject matter teachers are highly qualified—that is, that they hold a BA degree, are certified or licensed by the state, and demonstrate subject matter competence. Has NCLB influenced teacher quality in urban school districts?

Although the final verdict is not yet in, the preliminary answer appears to be no. To demonstrate subject matter competence, for example, the law requires new teachers to pass a set of exams. But it allows states to create other means by which experienced teachers can demonstrate competence. And according to some observers, states have used these alternative pathways, referred to as high objective uniform state standards of evaluation (HOUSSE), largely to circumvent the intent of the law.<sup>23</sup> In many states the HOUSSE system allows experienced teachers to become highly qualified by taking short professional development courses or participating in other activities of questionable value. In Florida, for instance, veteran teachers can meet HOUSSE content requirements and become “highly qualified” merely by receiving a satisfactory rating on their annual performance evaluation. Under New Hampshire’s HOUSSE rules, teachers can substitute a “self-evaluation” process for the required objective assessment of subject knowledge to be deemed “highly qualified.”<sup>24</sup>

At the same time, the teacher quality provisions in NCLB may have led to the introduction or expansion of alternative certification routes in some states. It is likely that the expansion of alternative certification opportunities has brought some highly effective teachers into urban districts, although it is difficult to quantify the benefits of such changes.<sup>25</sup>

## **Are More Qualified Teachers More Effective Teachers?**

It is clear that teachers in urban schools, particularly urban schools serving poor and minority children, are less qualified than their suburban colleagues in terms of such conventional measures as experience and educational background. But are they are less effective teachers; that is, are they less able to promote the learning and development of their students? As discussed in the article by Richard Murnane and Jennifer Steele in this volume, a growing body of research is linking individual teachers to student achievement scores to provide a direct measure of teacher effectiveness. These studies attempt to control for student background characteristics (including past achievement scores), as well as classroom and school characteristics that likely influence a student’s performance but should not be “counted” for or against the particular teacher. These “value-added” studies thus try to isolate the learning that a teacher adds to his or her students. Because the most rigorous and convincing such studies have been conducted in large districts such as Los Angeles, New York, and Chicago, the findings are particularly informative for policymakers and practitioners concerned with urban schools.

Two main research findings stand out. First, teacher effectiveness varies substantially as measured by a teacher’s value added. Simply put, not all teachers are the same.<sup>26</sup> For example, recent estimates suggest that moving a student from an average teacher to one at the 85th percentile would raise that student’s achievement test scores as much as reducing his class size by 33 percent.<sup>27</sup> The cumulative effect of teachers is even more striking. Researchers using Tennessee data, for example, find that a student who has three consecutive very high-quality teachers will gain 50 per-

centile points more on an achievement test than a student who has three consecutive average teachers.<sup>28</sup>

Second, many teacher characteristics bear surprisingly little relationship to student outcomes.<sup>29</sup> For example, according to a substantial body of research, certified teachers

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are not consistently more effective than uncertified teachers, older teachers are not more effective than younger teachers, and teachers with advanced degrees are not more effective than those without such degrees. Two recent studies of teacher certification in New York City find that teachers with no certification or with alternative certification are slightly less effective than traditionally certified teachers in their first year, but that they catch up with their peers within one to three years.<sup>30</sup>

Two teacher characteristics appear to be exceptions to the rule. The first is having one to three years of experience. Students of first-

or second-year teachers, for example, consistently do worse than those of more experienced teachers.<sup>31</sup> But beyond the first few years, experience does not appear to be particularly important. The second characteristic is high cognitive ability.<sup>32</sup> For example, some teachers who score higher on certification exams and some who attend more competitive undergraduate institutions produce larger performance gains for their children.<sup>33</sup> The body of research that examines this issue is limited, so this finding should only be considered suggestive.<sup>34</sup>

Another finding of particular importance for urban districts involves the interaction between teacher and student race. Teachers appear to be more effective with students of their own race or ethnicity.<sup>35</sup> Exactly why this is so is unclear, but observers suggest that both passive teacher effects, such as the teacher's simply serving as a role model, and active teacher effects, such as communication styles, pedagogy, and curriculum design, may play a role.

A recent study examined this issue using data from the Tennessee class-size reduction experiment, which randomly assigned teachers and students to classrooms. (The random assignment eliminates the possibility that teachers and students are assigned in ways that would confound analysis—for example, if more motivated and supportive black parents sought out black teachers for their children or if an older white teacher were assigned to teach a higher-performing class with many white children because of a seniority transfer.) In this setting, an additional year with a teacher of the same race increased student performance by 2–4 percentile points.<sup>36</sup> Another recent study of teacher effectiveness in a large urban Texas district finds that black students gain roughly 0.1 standard deviation

more when they have a black teacher than when they have a white teacher.<sup>37</sup>

However compelling these studies seem, they should not be considered definitive. Perhaps most important, insofar as teacher quality varies systematically with the student racial composition in the school, it is difficult to separate teacher quality from teacher race. Consider, for example, a scenario whereby the least competent white teachers end up in schools with a high share of black students because these schools are disproportionately poor, and the “best” white candidates are able to find jobs in more affluent schools. In this case, these studies may end up comparing the “average” black teacher with a set of “below-average” white teachers, leading one to overstate the benefit of having a same-race teacher.<sup>38</sup>

In fact, this situation illustrates a more general limitation of value-added measures. To control fully for unmeasured student characteristics that might influence teacher performance, value-added studies often compare teachers within the same school, thus limiting their ability to measure accurately the relative effectiveness of teachers in different schools. The difficulty is further increased in comparing teachers across districts.

What are the implications of value-added research for staffing urban schools? On one hand, the relative inexperience of urban teachers, as well as their often lower cognitive ability, suggests that they may be less effective at raising student achievement. (The benefits of experience found in research, however, are relatively small and exist only for teachers in their first few years.) On the other hand, urban teachers’ relative lack of traditional certification probably does not make them less effective.

Hence, at the most general level, the value-added studies offer two insights. First, a qualified teacher is not necessarily an effective teacher. Second, policies to enhance teacher quality must be evaluated in terms of their effect on student achievement. Both insights have implications for designing and assessing strategies to enhance teacher quality in urban districts. For example, given the negative link between teacher race and certification test scores, schools that recruit teachers with higher certification scores might hire fewer African American and Hispanic teachers, which could be exactly the wrong policy if the evidence on same-race teachers holds true.

### **Why Is It Hard to Recruit and Retain Teachers in Urban Districts?**

I draw once again on economics to provide a framework within which to consider the challenges of staffing urban schools. An urban district might experience a shortage of effective teachers for two reasons. One is supply; that is, schools are not able to attract enough high-quality teachers. The other is demand; that is, schools do not hire the right types of teachers. Several key supply and demand factors contribute to teacher shortages in urban districts.

#### **Supply Factors**

The most commonly discussed reasons for urban teacher shortages focus on supply—the number of teachers who are willing to work in an urban district at given salary levels at any given time. Not surprisingly, wages are important both in recruiting and in retaining qualified teachers. People are more likely to enter teaching when starting teacher salaries are high relative to salaries in other occupations. And they are more likely to leave teaching when outside wage options are higher.<sup>39</sup>

Working conditions appear to be even more important than wages, particularly for teachers in urban schools. Research in this area typically compares the salaries and student characteristics in the schools (or districts) that teachers leave with those in the schools (or districts) that teachers enter. A study of Texas, for example, found that mobility patterns among public school teachers were more strongly correlated with student characteristics than with salary levels.<sup>40</sup> Young teachers who switched districts gained only 0.4 percent in salary (about \$100), but their new districts had student achievement levels roughly 0.07 standard deviations higher than those of the districts they left. And their new schools had substantially smaller shares of poor and minority children. Indeed, the study found that teachers prefer a school with higher achievement levels, above and beyond its racial composition. It also found that African American and Hispanic teachers are less sensitive to student racial composition than are white teachers. In fact, conditional on student achievement and poverty levels, black teachers were more likely to remain in their districts as the share of black children in their schools rose, whereas white teachers were significantly more likely to leave.<sup>41</sup>

A study of teachers in Georgia reached similar conclusions.<sup>42</sup> Elementary teachers left low-performing, high-minority schools, but black teachers responded less to the racial composition of the school than did white teachers. A recent study of New York City found that teachers with high scores on the state certification exam are much more likely to leave low-performing schools than their colleagues, even after controlling for factors such as student and teacher race.<sup>43</sup> This finding suggests that teacher and student ability—rather than race per se—may be respon-

sible for the teacher mobility patterns observed in such studies.

Although these studies shed light on teacher mobility, they cannot distinguish between supply factors and demand factors, making it difficult to interpret some of the findings. For example, most teacher mobility studies cannot say whether black teachers are less likely to leave high-minority schools for reasons of supply—because they simply prefer to remain in these environments (perhaps because they are more effective than their white colleagues)—or for reasons of demand—because they do not have the other opportunities available to their white colleagues. Another limitation of these studies is that if they do not fully account for all the working conditions relevant to teachers, they may understate the importance of salary.<sup>44</sup>

A less commonly discussed reason for the limited supply of high-quality teachers in urban areas involves geography. Unlike many other professions, elementary and secondary education operates in a predominantly local labor market. Researchers from Stanford and the State University of New York conducting extensive studies in New York State find that teachers prefer to teach close to where they grew up and in areas demographically similar to their hometown.<sup>45</sup> The high turnover in low-achieving urban schools, particularly among more highly qualified teachers, may thus in part reflect a preference for living close to home rather than a desire to avoid low-achieving or minority children. To the extent that teacher qualification and effectiveness are correlated, this phenomenon will contribute to a damaging cycle, whereby poorly educated graduates from disadvantaged districts return to teach in those same districts.

## **Demand Factors**

A growing body of evidence suggests that demand is also at work in urban teacher shortages. Specifically, principals and administrators in high-poverty urban schools may not recognize or value high-quality teachers either in hiring or in retention decisions. A study based on national data from the early 1990s finds that teacher candidates from the most selective colleges and universities (candidates who research suggests may be effective teachers) are not as likely to be hired as those from less selective institutions, even after taking into account the number and type of schools to which the applicants applied.<sup>46</sup>

Why might this be the case? One explanation is that principals simply have different objectives or opinions about what constitutes a “high-quality” teacher. For example, principals may be looking for a teacher who can provide students with a good role model or enforce strict discipline rather than one who can best teach math or reading. Or principals may believe that college selectivity is not a good indicator of teacher performance. Another explanation is that principals cannot accurately assess teacher quality in the hiring process, either because they lack information or because it is simply difficult to judge future performance.

In fact, principals seem to have some difficulty identifying the relative effectiveness even of their own teachers—those with whom they interact and whom they observe—and not just those whom they see briefly in a job interview. Principals do seem to be able to identify the best and worst teachers in their schools—but not to distinguish between teachers in the middle of the ability distribution, roughly between the 20th and 80th percentiles.<sup>47</sup> The most common mistakes that principals tend to make are to

give too much weight to the teacher’s most recent experience and not to account properly for the ability level of incoming students in the teacher’s class.<sup>48</sup>

Finally, dysfunctional bureaucracy can contribute to teacher shortages in urban districts. A case study of four urban districts by the New Teacher Project, for example, found that these districts lost good candidates because of late hiring.<sup>49</sup> Among the causes for late hiring were policies that allowed exiting teachers to provide late notification to the district, policies that allowed experienced teachers to transfer between schools at the last minute, late state budget deadlines, and antiquated and dysfunctional human resource departments. Together, such bureaucratic problems kept these districts from making many offers until July or August, months after surrounding districts had made offers and long after many highly qualified candidates had accepted other jobs. Another study argues that high levels of out-of-field teaching in urban schools can be explained in large part by the inefficient assignment of teachers rather than actual shortages.<sup>50</sup>

## **How Can Urban School Districts Improve the Quality of Their Teachers?**

Urban districts have tried various initiatives, ranging from recruitment to retention to professional development, to improve the quality of their workforce. Some programs take a free-market approach to encourage more teachers to enter the profession; others rely on more prescriptive regulations or guidelines. Many policies target specific types of teacher candidates (for example, those from elite colleges, or with particular language skills, subjects, or grade levels), while others are broad in scope. Despite the many reform initiatives, however, researchers have gath-

ered little evidence on the effectiveness of these programs.

### Supply-Oriented Strategies

Many of the most common strategies focus on increasing the supply of teacher candidates. Examples of such policies include salary increases, improved working conditions, and alternative paths into teaching and mentoring.

*Higher Salaries.* One way to improve teaching quality is to increase salaries—either by uniform increases for all teachers or by targeted salary increases or bonuses. Although higher salaries do boost retention rates, uniform salary increases seem unlikely to pass a cost-benefit test. The difficulty of recruiting and retaining teachers varies dramatically across schools, education levels, and subject areas. Even in highly disadvantaged urban districts, for example, some elementary schools have little trouble hiring for general teacher positions. Uniform salary increases will inevitably provide additional compensation to many teachers who would have taught in the same position anyway.

A potentially more cost-effective approach is to offer targeted bonuses or higher salaries to attract and retain teachers in hard-to-staff schools and subject areas. Indeed, many states and districts have experimented with such programs. In 1998, for example, Massachusetts combined a national recruitment campaign, \$20,000 signing bonuses, and a seven-week “fast track” certification process to attract highly qualified new teachers to high-need districts. But the program had limited success in placing bonus recipients in high-need schools (many ended up teaching in affluent, high-achieving districts), and many of the bonus teachers left teaching within several years.<sup>51</sup> In 2001 North Car-

olina began giving \$1,800 annual bonuses to teachers of math, science, and special education in middle and high schools serving low-income or low-performing students. Despite some confusion regarding eligibility requirements, researchers have found that the introduction of this bonus payment reduced turnover of the targeted teachers by roughly 12 percent, relative to what it would have been in the absence of the program. Interestingly, the policy seemed to have the strongest effect for experienced teachers.<sup>52</sup> Although the evidence to date is limited, state and district officials might consider a targeted salary enhancement program with clear eligibility rules and substantial dollar amounts.

*Improved Working Conditions.* A second way to enhance the quality of the workforce is to improve working conditions. But research offers little practical guidance here. Most studies focus on student characteristics such as race, ability, and behavior, all of which are hard to change. Generally, studies suggest that most teachers are attracted to high-functioning schools with competent administrators, dedicated colleagues, and reasonably well-behaved children, who are “teachable” even if they may come from poor families and have low skills. These are schools where teachers feel they can make a difference. But from a policy perspective, the problem is that such a school is exactly what most school reform efforts are trying to create. Thus trying to improve working conditions in isolation involves a Catch-22: to improve working conditions to attract effective teachers, it is necessary to reform the whole school, but whole school reform will not work without effective teachers.

Yet another way to attract and, especially, to retain teachers is to change the structure of the teaching career. Much has been written

about career ladders, which would allow teachers to pursue in-depth professional development and take on responsibilities outside the classroom, such as mentoring other teachers or developing curriculum. Indeed, international comparisons show that teaching and learning is organized quite differently in other countries. In Japan, for example, teachers spend only half their time in the classroom and the other half on extensive professional development activities.<sup>53</sup> Although 20 percent of teachers leaving high-poverty urban schools report that more opportunities for advancement might induce them to stay,<sup>54</sup> there is little systematic evidence on whether such programs increase teacher retention.<sup>55</sup> Hence, the career ladder strategy may be worth pursuing more carefully, combining well-designed policy changes with rigorous evaluation studies.

*Alternative Paths into Teaching.* In recent years, debate has been brewing within the academic and policy communities over the relative effectiveness of regularly certified versus alternatively certified or uncertified teachers. This issue, unlike some others, has generated relatively good research evidence. The most rigorous and well-designed evaluations to date indicate that, at least for elementary school math and reading teachers, teachers with traditional certification and those with alternative certification differ little in average effectiveness. With the exception of Teach for America (TFA), where attrition rates are high, the attrition rates of the two groups do not seem to differ substantially, either. And in the case of TFA, taking attrition and effectiveness together over the long run, there is still little advantage to hiring a traditionally certified teacher over a TFA candidate, or vice versa.

This finding suggests that urban districts should not require all candidates to obtain

traditional certification, but should rather encourage the development of a variety of high-quality alternatives. More generally, research underscores the importance of identifying and encouraging effective teachers regardless of their certification status. Individual districts generally have some flexibility when it comes to hiring alternatively certified teach-

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*In Japan, for example, teachers spend only half their time in the classroom and the other half on extensive professional development activities.*

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ers, although teacher certification policy is most often decided by the state.

*Specific Recruitment Strategies.* Districts have pursued various strategies to recruit people, particularly minorities, into teaching. Some have created partnerships between K–12 school districts and local colleges to encourage students to enter teaching. Others have offered scholarships or loan forgiveness for candidates who commit to teaching for a certain period. The Urban Teacher Academy Project (UTAP) in the Broward County Public Schools in Florida combines a high school program with college scholarships and a guaranteed teaching job.<sup>56</sup> The high school program includes mentoring and training, field trips, teaching and tutoring at local elementary schools, and other special programs. But evidence on how well such programs work is virtually nonexistent. A recent review of the research by analysts at RAND and the Education Commission of

the States (ECS) concludes that “there were simply no adequate studies available on the great majority of the specific recruitment strategies that have been employed by states and districts.”<sup>57</sup>

*Teacher Mentoring Programs.* Many districts have tried to reduce attrition through induction and mentoring programs for new teach-

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*Hiring practices have received relatively little attention from educators and policymakers, even though their improvement may offer districts considerable opportunities to improve the workforce.*

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ers. Induction programs typically involve meetings, informal classes for new teachers, and peer-support groups. Mentoring programs generally pair novice teachers with experienced teachers, although the type and extent of interaction between the teachers vary considerably. Educators claim that such programs are critical for retaining high-quality teachers, and surveys find that a lack of support is a key reason why teachers change schools or leave the profession. A recent review found 150 published empirical studies of mentoring and induction programs, but only twelve included a comparison group and were judged minimally rigorous, and only three met the highest research standards.<sup>58</sup> Of these three, only one examined teacher or student outcomes. It found that 141 teachers in New Mexico who participated in a mentor-

ing program had only a 4 percent annual attrition rate compared with the statewide average of 9 percent.<sup>59</sup> Mathematica Policy Research is now rigorously evaluating two high-intensity, well-respected induction programs—one designed by the New Teacher Center at the University of California–Santa Cruz and the other developed by the Educational Testing Service. Both rely heavily on mentor teachers who receive extensive training and are released from teaching for an entire year. Each mentor works with twelve teachers on a wide range of issues important to new teachers.<sup>60</sup>

### Demand-Oriented Strategies

Likewise, urban schools have also tried various strategies to affect demand for teachers.

*Improve Hiring Practices.* Hiring practices have received relatively little attention from educators and policymakers, even though their improvement may offer districts considerable opportunities to improve the workforce. As noted, Chicago’s public schools get roughly twenty certified applicants for every general education elementary teaching position. There are three ways in which hiring practices might be improved to enhance the quality of the teacher workforce in urban districts.

First, urban districts could streamline the administrative procedures associated with hiring so that they can make job offers more quickly. Although the ability to make timely offers depends in part on collective bargaining agreements and state budgeting issues, districts could make considerable improvements through mundane bureaucratic reforms.

Second, districts could improve their ability to identify effective teachers from the pool of



candidates. Many districts do not hire the best available candidates, and principals even have trouble differentiating between teachers with whom they have worked for years. All districts and principals now use some type of screening in hiring—most commonly, interviews by district staff and school personnel. Many districts also use personnel assessments to identify effective teachers. One of the most frequently used assessments, the Gallup Teacher Insight Assessment, consists of multiple-choice items and open response questions that assess each candidate's pedagogical knowledge and personality traits.<sup>61</sup> But how districts use these assessments or whether they can identify effective teachers is not clear. Better screening of applicants could help them improve their workforce considerably.

A third, related issue is whether teachers are hired by the district or by the school. In large districts, teachers have traditionally been hired by the central office and then placed into schools with little careful consideration. To the extent that schools have unique needs, principals have specific preferences, and teachers have unique strengths and weaknesses, a more decentralized process would likely result in better matches between teachers and schools. Indeed, many large urban districts have recently switched to decentralized hiring. Chicago, for example, hosts several job fairs each year, where teacher candidates can interview school representatives, who can then make independent decisions about whom they would like to hire. But although decentralized hiring could improve the match between teachers and schools, it might also lead to more inequities if more effective schools are better at identifying effective teachers or if these schools are more attractive to effective teachers.

*Selectively Dismiss Ineffective Teachers.* One option that has received little attention in discussions of teacher quality is to dismiss underperforming teachers. Although most educators would agree that grossly incompetent teachers should be removed from the classroom, dismissals are rare. In urban districts in 2003–04, the share of teachers dismissed or not renewed was 1.4 percent—a figure that likely overstates the share of teachers dismissed for cause, since poor performance is only one of many factors that can lead to nonrenewal. Indeed, according to an informal survey of the human resource departments in several large urban districts, less than 1 percent of the teaching force is dismissed each year, with slightly more tenured than untenured teachers dismissed.

What might explain the apparent reluctance of administrators to dismiss teachers? One often-cited explanation is administrative hurdles involving firing outlined in collective bargaining agreements, including a documentation and appeal process that principals describe as extremely burdensome. Although this explanation certainly holds true for tenured teachers, dismissing untenured teachers is considerably less difficult. Yet dismissals of probationary teachers are still rare. One reason might be that dismissing a teacher imposes considerable costs on a principal or school, or both. Administrators must take the time and energy to hire a replacement and integrate the new teacher into the school. And because new teachers are less effective, on average, than experienced teachers, replacing an older teacher with a novice, all else equal, is likely to worsen student performance in the short run.

Thus it will make sense for a principal to dismiss a teacher only if she is certain that the teacher is less effective than the replacement

will be and if the benefits associated with the new “more effective” teacher outweigh the costs associated with firing and hiring. In theory, it is not clear how often these conditions will be met.

In an intriguing new study, several researchers have tried to estimate the costs and benefits of the teacher dismissal decision using data from New York City. They show

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*A teacher whose students make larger than average gains in her first two years is likely to produce larger than average student gains thereafter.*

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that data on student achievement gains during a teacher’s first two years in the classroom make it possible to predict reasonably well how effective that teacher will be later. In other words, a teacher whose students make larger than average gains in her first two years is likely to produce larger than average student gains thereafter. Conversely, a teacher who performs poorly in the first two years is unlikely to undergo a radical transformation in year three. Moreover, the researchers find extremely large differences between teachers during their first years of teaching in terms of raising student performance. That is, not all teachers are the same—or close to the same—even as they begin teaching. Then the researchers calculate how much teachers improve on average in the first few years of teaching. As do other studies, they find that second- and third-year teachers are more effective than first-year

teachers, but the difference is relatively modest. Putting all these pieces together, the authors are able to estimate the relative benefit of dismissing an ineffective (that is, below-average) untenured teacher, assuming that one would be able to replace the teacher with an average novice teacher.

Their findings are surprising. Using quite conservative assumptions about the costs of replacing teachers, they conclude that denying tenure to the bottom *quarter* of new teachers would substantially improve student achievement.<sup>62</sup> In comparison with the current dismissal rate of roughly 1 percent, a proposal that calls for denying tenure to 25 percent of new teachers seems shocking. Yet the intuition behind the conclusion is quite plausible. Given the tremendous variation in effectiveness documented even among first-year teachers, in conjunction with a relatively modest benefit to an additional year of experience, replacing an ineffective teacher with the “average” new teacher will almost certainly be a net gain for a school.

Does this mean that urban districts should start firing a quarter of their new teachers each year? At least two issues would have to be addressed before implementing such a policy. First, the system would have to be reasonably fair to individual teachers. Even if the system described above would improve student outcomes on average, it would certainly make “mistakes” in some cases. For example, a potentially effective teacher might produce very low student achievement gains during her first two years for idiosyncratic reasons. Conversely, a poor teacher might, by chance, have students during his first two years that make reasonable gains. Second, care would have to be taken about how such a policy would affect the supply of people who choose to enter teaching. A college stu-

dent considering a teaching career who knows that she has a one-in-four chance of being dismissed within three years may be less willing to enter the profession. If the individuals who are discouraged from entering teaching by such a policy are indeed less competent than others, then this type of strategy might be helpful. But if the policy discouraged potentially effective teachers, it could be detrimental in the long run.

A final point is worth noting. Even if the preceding analysis were absolutely correct, and it were possible to address the cautions described above, this policy would apply only to the relatively limited set of teachers for whom it is possible to calculate value-added measures—namely, reading and math teachers in grades three to eight and a handful of high school teachers whose students take consistent standardized exams across grades.<sup>63</sup> Hence, even in an ideal setting, this type of dismissal policy would be only a partial solution to the issue of ineffective teachers. A comprehensive human resources approach will necessarily include other strategies, such as professional development, mentoring, and improved hiring practices.

## Conclusions

Staffing urban schools with effective teachers poses a formidable challenge for superintendents and state officials. The response to the teacher quality provisions in NCLB illustrates that it can be much easier to relabel the problem rather than address it directly. Evidence on teacher recruitment and retention suggests several important lessons.

First, there is no silver bullet. The problem is too large and too complex to be solved easily. Policymakers and educators must resist falling into unproductive battles over issues, such as certification, that tend to pit the free-

market camp against the professionalism camp in the same way as the “reading wars” of the 1980s and 1990s pitted phonics advocates against whole-language advocates.

Second, local responses to this problem are limited in important ways. The importance of geography and working conditions in teacher decisions suggests that it may be difficult or extremely expensive to solve the problem through recruitment and retention alone. Professional development, performance incentives, or other policies to improve the effectiveness of the *existing* workforce are important complements to recruitment and retention policies.

Third, at least part of the problem may be operational. The inability of many urban districts to make offers to teacher candidates until July or August could be addressed, at least in part, by improving human resource systems and renegotiating certain contract provisions with local unions.

Finally, researchers and policymakers should focus more energy on demand-oriented strategies that would improve the ability of district administrators to identify and hire the most qualified applicants. The tremendous variation in teacher quality—even within schools and among teachers who have the same certification and experience—highlights the importance of understanding what makes an effective teacher and of helping administrators better predict who will be successful in the classroom. It is imperative that teacher screening tools such as the Gallup Insight Assessment or the Haberman Interview Protocol, which are used by hundreds of school districts nationwide, be rigorously validated.

Because even districts that are extremely efficient in hiring will invariably hire some

teachers who do not perform well in the classroom, it is also important to consider teacher tenure policy. Although it is politically and financially costly to dismiss existing teachers, it is easier to distinguish between effective and ineffective teachers once they start teaching than to predict which teachers will be effective. The recent proposal to deny tenure to one-quarter of new teachers has

met with some strong opposition. The lesson the proposal offers, however, is not that 25 percent, or any other specific share, of teachers is incompetent. Instead, it is that focusing on recruitment and retention alone may be a mistake. Although dismissal policies are complicated and controversial, it is imperative that researchers and policymakers begin to address this issue.

## Notes

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4. D. Kerbow, “Patterns of Urban Student Mobility and Local School Reform,” *Journal of Education of Students Placed at Risk* 1, no. 2 (1996): 147–69; K. L. Alexander, D. R. Entwisle, and S. L. Dauber, “Children in Motion: School Transfers and Elementary School Performance,” *Journal of Educational Research* 90, no. 1 (1996): 3–12.
5. Robert D. Putnam, *Bowling Alone: The Collapse and Revival of American Community* (New York: Simon and Schuster, 2000); Robert J. Sampson, Stephen Raudenbush, and Felton Earls, “Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy,” *Science* 277 (1997): 918–24; Robert J. Sampson, Jeffrey Morenoff, and Felton Earls, “Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children,” *American Sociological Review* 64 (1999): 633–60.
6. Caroline M. Hoxby, “Does Competition among Public Schools Benefit Students and Taxpayers?” *American Economic Review* 90, no. 5 (2000); Caroline M. Hoxby, “School Choice and School Productivity (Or, Could School Choice Be a Rising Tide That Lifts All Boats?),” in *The Economics of School Choice*, edited by C. Hoxby (University of Chicago Press, 2003).
7. For more details on the critique of Hoxby’s original analysis, see Jesse Rothstein, “Does Competition among Public Schools Benefit Students and Taxpayers? A Comment on Hoxby (2000),” *American Economic Review* (forthcoming), and Hoxby’s response, “Competition among Public Schools: A Reply to Rothstein,” Working Paper 11216 (Cambridge, Mass.: National Bureau of Economic Research, 2004). For further evidence on the impact of competition among schools, see Victor Lavy, “From Forced Busing to Free Choice in Public Schools: Quasi-Experimental Evidence of Individual and General Effects,” Working Paper 11969 (Cambridge, Mass.: National Bureau of Economic Research, January 2006).
8. Open enrollment programs, also known as intradistrict choice, may provide an analogous type of competition for public schools in large cities, although there is little evidence that such programs have a substantial impact on student outcomes. See, for example, J. Cullen, B. Jacob, and S. Levitt, “The Effect of School Choice on Student Outcomes: Evidence from Randomized Lotteries,” *Econometrica* 74, no. 5 (2006): 1191–230; J. Cullen, B. Jacob, and S. Levitt, “The Impact of School Choice on Student Outcomes: An Analysis of the Chicago Public Schools,” *Journal of Public Economics* 89, nos. 5–6 (2005): 729–60.
9. NCES, *2003–04 Schools and Staffing Survey*, <http://nces.ed.gov/pubs2006/2006313.pdf> (April 1, 2006).
10. Personal communication with Nancy Slavin, Director of Teacher Recruitment, Chicago Public Schools, March 2006.
11. E-mail communication with Andy Sokatch of the New Teacher Project, August 25, 2006.

12. Jessica Levin and Meredith Quinn, *Missed Opportunities: How We Keep High-Quality Teachers out of Urban Schools* (New York: New Teacher Project, 2003).
13. According to an analysis by Ingersoll, 91.6 percent of teachers in U.S. public schools are fully certified, with slightly lower shares in secondary schools compared with elementary schools. The certification rates are only slightly lower in high-poverty urban schools, suggesting that lack of certification might not be as prevalent as one might have suspected. Richard M. Ingersoll, "Out-of-Field Teaching and the Limits of Teacher Policy" (Center for the Study of Teaching and Policy and the Consortium for Policy Research in Education, 2003).
14. Charles T. Clotfelter, Helen F. Ladd, and Jacob L. Vigdor, "Who Teaches Whom? Race and the Distribution of Novice Teachers," *Economics of Education Review* (forthcoming); Hamilton Lankford, Susanna Loeb, and James Wyckoff, "Teacher Sorting and the Plight of Urban Schools," *Educational Evaluation and Policy Analysis* 24 (2002): 37–62.
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18. Charles T. Clotfelter, Helen F. Ladd and Jacob L. Vigdor, "Teacher-Student Matching and the Assessment of Teacher Effectiveness," Working Paper 11936 (Cambridge, Mass.: National Bureau of Economic Research, 2006).
19. Ingersoll, "Out-of-Field Teaching and the Limits of Teacher Policy" (see note 13).
20. Richard M. Ingersoll, "Why Do High-Poverty Schools Have Difficulty Staffing Their Classrooms with Qualified Teachers?" (Center for American Progress and Institute for America's Future, 2004).
21. Lankford, Loeb, and Wyckoff, "Teacher Sorting" (see note 14).
22. Eric A. Hanushek and others, "The Market for Teacher Quality," Working Paper 11252 (Cambridge, Mass.: National Bureau of Economic Research, 2005). Jonah E. Rockoff, Thomas J. Kane, and Douglas O. Staiger come to a similar conclusion, "What Does Certification Tell Us about Teacher Effectiveness? Evidence from New York City," Working Paper 12155 (Cambridge, Mass.: National Bureau of Economic Research, 2006).
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24. Education Trust, "Telling the Whole Truth (or Not) about Highly Qualified Teachers" (2003).
25. I would like to thank Cecilia Rouse and Susanna Loeb for pointing out this potential effect.
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27. Rockoff, "The Impact of Individual Teachers on Student Achievement" (see note 26); Hanushek and others, "The Market for Teacher Quality" (see note 22).
28. William L. Sanders and June C. Rivers, *Cumulative and Residual Effects of Teachers on Future Student Academic Achievement* (Knoxville: University of Tennessee Value-Added Research and Assessment Center, 1996).
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30. Kane, Rockoff, and Staiger, "What Does Certification Tell Us about Teacher Effectiveness?" (see note 22); Donald Boyd and others, "How Changes in Entry Requirements Alter the Teaching Workforce and Affect Student Achievement," Working Paper 11844 (Cambridge, Mass.: National Bureau of Economic Research, 2005).
31. Rockoff, "The Impact of Individual Teachers" (see note 26); Hanushek and others, "The Market for Teacher Quality" (see note 22).
32. Ronald E. Ferguson, "Paying for Public Education: New Evidence on How and Why Money Matters," *Harvard Journal on Legislation* 28 (1991): 465–98; Ronald G. Ehrenber and Dominic J. Brewer, "Do School and Teacher Characteristics Matter? Evidence from High School and Beyond," *Economics of Education Review* 13 (1994): 1–17.
33. For a recent example, see Clotfelter, Ladd, and Vigdor, "Teacher-Student Matching" (see note 18).
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35. Ronald F. Ferguson, "Teachers' Perceptions and Expectations and the Black-White Test Score Gap," in *The Black-White Test Score Gap*, edited by Christopher Jencks and Meredith Phillips (Brookings, 1998).
36. Thomas S. Dee, "Teachers, Race, and Student Achievement in a Randomized Experiment," *Review of Economics and Statistics* 86 (2004): 195–210.
37. Hanushek and others, "The Market for Teacher Quality" (see note 22).
38. Others have hypothesized that certain teachers may be more effective with low-achieving students, while others may be more effective with high-achieving students. There is little good evidence on this question, although some research suggests that a teacher's ability extends, at least to some extent, to students of all ability levels. That is, teachers who are particularly (in)effective with low-ability students also tend to be (in)effective with high-ability students. See, for example, Brian A. Jacob and Lars Lefgren, "Principals as Agents: Subjective Performance Measurement in Education," Working Paper 11463 (Cambridge, Mass.: National Bureau of Economic Research, 2005); Hanushek and others, "The Market for Teacher Quality" (see note 22).
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  41. It is worth noting that factors such as neighborhood crime rates may be an important aspect of working conditions that act to disadvantage urban districts.
  42. Benjamin Scafidi, Todd Stinebrickner, and David L. Sjoquist, “Race, Poverty, and Teacher Mobility,” *Economics of Education Review* (forthcoming).
  43. Boyd and others, “Explaining the Short Careers of High-Achieving Teachers in Schools with Low-Performing Students” (see note 26).
  44. Susanna Loeb and Marianne Page, “Examining the Link between Teacher Wages and Student Outcomes: The Importance of Alternative Labor Market Opportunities and Non-Pecuniary Variation,” *Review of Economics and Statistics* 82 (2000): 393–408.
  45. Donald Boyd and others, “The Draw of Home: How Teachers’ Preferences for Proximity Disadvantage Urban Schools,” *Journal of Policy Analysis and Management* 24 (2005): 113–23.
  46. Dale Ballou, “Do Public Schools Hire the Best Applicants?” *Quarterly Journal of Economics* (1996): 97–133. Interestingly, administrators do appear to value candidates with a higher grade point average.
  47. Jacob and Lefgren, “Principals as Agents” (see note 38).
  48. The study of the large Texas district described above provides some additional evidence on this. The researchers examine teachers who switch districts, and examine whether those teachers with higher quality end up in districts with better salaries or working conditions. They find that teachers with more advanced degrees and certification tend to go to districts with higher salaries and fewer black students, but that there is no relationship between teacher value added and the type of district where they end up. This suggests that districts may not be hiring teachers who are most effective in practice.
  49. Levin and Quinn, *Missed Opportunities* (see note 12).
  50. Ingersoll, “Out-of-Field Teaching and the Limits of Teacher Policy” (see note 13). Suppose, for example, that a school had to teach eight biology classes and seven chemistry classes, and that the standard work load is five classes per teacher. In this scenario, the school would have to hire three teachers total to cover the biology and chemistry classes. Assuming that teachers are only certified in one field (which is likely to be the case, since certification generally requires a college major in the field), it is not possible for the school to have every biology and chemistry class covered by a “certified” teacher unless it hires more than three teachers. If the school hires two biology teachers and one chemistry teacher, then the second biology teacher will likely be forced to teach two chemistry courses, which will be considered “out-of-field” teaching. Ingersoll argues that this phenomenon is, in part, a result of schools’ trying to provide a broad array of services with limited resources. Of course, it is not clear what an individual principal could do in this case, given the array of courses that the school is required to offer.
  51. R. Clarke Fowler, “The Massachusetts Signing Bonus Program for New Teachers. A Model of Teacher Preparation Worth Copying?” *Education Policy Analysis Archives* 11 (2003); Edward Liu, Susan M. John-



- son, and Heather G. Peske, "New Teachers and the Massachusetts Signing Bonus: The Limits of Incentives," *Educational Analysis and Policy Evaluation* 26, no. 3 (2004).
52. Charles T. Clotfelter and others, "Teacher Bonuses and Teacher Retention in Low Performing Schools: Evidence from the North Carolina \$1,800 Teacher Bonus Program," *Public Finance Review* (forthcoming); Charles T. Clotfelter and others, "Would Higher Salaries Keep Teachers in High-Poverty Schools? Evidence from a Policy Intervention in North Carolina," Working Paper 12285 (Cambridge, Mass.: National Bureau of Economic Research, 2006).
53. Harold W. Stevenson and James W. Stigler, *The Learning Gap: Why Our Schools Are Failing and What We Can Learn from Japanese and Chinese Education* (New York: Touchstone, 1992).
54. Ingersoll, "Why Do High-Poverty Schools Have Difficulty Staffing Their Classrooms with Qualified Teachers?" (see note 20).
55. Bruce W. Hall, L. Carolyn Pearson, and DeLos Carroll, "Teachers' Long-Range Teaching Plans: A Discriminant Analysis," *Journal of Educational Research* 85 (1992): 221–25; Susan M. Johnson and Sarah E. Birkeland, "Pursuing a 'Sense of Success': New Teachers Explain Their Career Decisions," *American Educational Research Journal* 40 (2003): 581–617.
56. Jacqui Goddard, "In Florida, a Bid to Expand the Teaching Pool," *Christian Science Monitor*, January 5, 2005.
57. Michael B. Allen, "Eight Questions on Teacher Recruitment and Retention: What Does the Research Say?" (Denver: Education Commission of the States, 2005).
58. Richard Ingersoll and Jeffrey M. Kralik, "The Impact of Mentoring on Teacher Retention: What the Research Says" (Denver: Education Commission of the States, 2004); Allen, "Eight Questions on Teacher Recruitment and Retention (see note 57).
59. S. J. Odell and D. P. Ferraro, "Teacher Mentoring and Teacher Retention." *Journal of Teacher Education* 43, no. 3 (1992): 200–04.
60. Steven Glazerman and others, "Design of an Impact Evaluation of Teacher Induction Programs: Final Report," Report 6137-070 (Mathematica Policy Research, January 11, 2006).
61. For more information on the Teacher Insight Assessment, see <http://education.gallup.com/content/default.aspx?ci=868>.
62. Robert Gordon, Thomas J. Kane, and Douglas O. Staiger, "Identifying Effective Teachers Using Performance on the Job," White Paper 2006-01 (The Hamilton Project, Brookings, April 2006); Kane, Rockoff, and Staiger, "What Does Certification Tell Us about Teacher Effectiveness?" (see note 22).
63. There are several additional complications and caveats associated with the analysis presented in Gordon, Kane, and Staiger, "Identifying Effective Teachers" (see note 62), and Kane, Rockoff, and Staiger, "What Does Certification Tell Us" (see note 22). First, the correlation between math and reading effectiveness is not perfect, so that one could potentially end up dismissing ineffective math (reading) teachers who were quite effective in the other subject. More generally, early measures of value added are less predictive of subsequent student achievement in reading relative to math and less predictive for teachers in the middle grades than for elementary grades teachers.