

The Preparation and Recruitment of Teachers

A Labor-Market Framework

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A central question facing education policymakers is how to structure entry pathways into teaching. One possibility is to set no requirements, allowing public school administrators to choose their preferred candidates from the pool of individuals interested in a teaching position. An alternative is to require some set of qualifications for those teaching in the public schools. These qualifications could include a high school degree, a bachelor's degree, required courses, specific work experience, and/or minimum performance on an exam or series of exams. There is little solid evidence that requiring qualifications benefits students or, if so, which qualifications are best. In fact, short of understanding the effects of setting requirements, we know little about the direct effects these qualifications have on teaching ability. These are quite different questions, as teachers may perform better with a given qualification, but requiring that qualification may separately influence the overall effectiveness of the teacher work force if it alters who chooses to teach or where teachers choose to teach. For example, college graduates with ample opportunities in other occupations may be less likely to pursue teaching jobs if they are required to complete many additional courses before entering the classroom to teach.

Teachers and prospective teachers appear quite responsive in their career choices to changes in policies and available opportunities. This responsive-

ness creates labor-market forces that are central to understanding the characteristics of the teachers that populate our classrooms.

This paper focuses on the role of labor-market dynamics in determining the effects of education policy initiatives that address certification and recruitment of teachers. We set a framework for approaching the questions of whether (and, which) qualifications should be mandated for elementary and secondary public school teachers. We start by describing the qualifications of the current teaching force and the distribution of teachers across schools. We ask what factors influence teachers' decisions of whether and where to teach, and describe current teacher wages, the nonwage characteristics of work environments, and the location of available jobs. We conclude with a discussion of the pros and cons of policy approaches for improving the work force.

We know quite a bit about who teachers are and where they teach. However, holes in our knowledge make it difficult to predict the effect of reforms aimed at improving the quality of teaching. We know of a number of job characteristics, such as salary and student body attributes, that influence individuals' decisions whether to enter teaching and teachers' choices of teaching jobs, but we do not have strong evidence on the relative importance of most job characteristics on these career choices. We do not know how much additional salary compensates for increased class size or for working for a first-year principal who is still learning how to lead. We have some evidence on the connection between teacher qualifications and effective teaching, but much of the variation in teacher quality is unexplained. We also do not know which aspects of teacher preparation contribute to teachers' abilities in the classroom. A lack of appropriate data, perhaps combined with a disconnect between researchers who understand institutions of education and those with appropriate data analysis skills, is partly responsible for the scarcity of information about teacher effectiveness. In any event, this scarcity makes it difficult to design with confidence cost-effective policies for improving teaching and, ultimately, student outcomes. We are left to rely on general principles and descriptive information, which may or may not be solid footing for reform.

WHO TEACHES?

Before addressing the potential labor-market effects of changes in licensure and certification, it is worth considering the characteristics of the current work force, which result, at least in part, from current and past requirements.

Degrees and Certifications

In 1961, 15 percent of teachers had not completed an undergraduate degree. By the early 1980s, nearly all teachers had a bachelor's degree, and more teachers held a master's degree or higher than held only a bachelor's.¹ The educational attainment of teachers varies by the type of school in which the teacher works. High school teachers are more likely to hold master's degrees than are middle school teachers, who in turn are more likely to hold master's degrees than elementary school teachers. Degree attainment also varies by region of the country. The Northeast has the highest proportion of teachers with master's degrees (60%), followed by the Midwest (51%). A much lower proportion of teachers in the South (39%) and West (38%) have advanced degrees.²

Many teachers acquire their master's degree while teaching. Approximately 16 percent of teachers with less than three years' experience have a master's degree, as compared with 62 percent of those with more than 20 years of experience.³ Teachers obtain these degrees at least in part because of state requirements and/or pay raises. In addition to degree requirements for teaching, states require teachers to have a specialized certification. In the 1999–2000 academic year, 94.4 percent of public elementary and secondary teachers were certified in their main teaching assignment.⁴

Controversy surrounds the evidence for whether certification or degree attainment improves teacher effectiveness, partly because of the inherent difficulties of assessing these effects. The performance of students in two classes, one with a teacher who has a master's degree and one with a teacher who does not, may be very similar. This could be because a master's degree does not help teachers become more effective, or it might be the result of the school hiring the less educated teacher because he or she had some special skill that we, as outsiders, cannot observe. Data have not been available that would allow us to assess teachers before and after their education to ascertain whether obtaining advanced degrees changes the effects that teachers have on their students. The closest evidence comes from assessment of some teacher professional-development programs, where there is weak evidence that high-quality programs can improve student outcomes.⁵ However, the potential for advanced education to improve teaching and the effect of average programs may be quite different; some programs and degrees are better than others. And once master's programs are mandated or given substantial returns in teacher contracts, teachers may seek out particularly low-cost (in both time and money) degree programs in order to reap the salary benefits with the least effort. These low-

cost programs may not improve teachers' effectiveness, even if other programs might.

Most research finds that teachers with a master's degree do not, on average, contribute more to student learning than teachers without one.⁶ Evidence of the effect of certification is more mixed, partly because almost all teachers are certified, and those who are uncertified are far more likely to teach in schools with low-performing students. This selection leads to a strong positive correlation between test scores and the percentage of certified teachers in a school, but makes it difficult to show causation.⁷ The problem is compounded by the fact that most uncertified teachers have little teaching experience, and there is convincing evidence that teachers in their first few years of teaching are less able to help students learn and less consistent in their teaching abilities.⁸ The lack of data on more experienced teachers without certification and the concentration of uncertified teachers in low-performing schools make it difficult to estimate the causal effect of certification on student outcomes.

Test Scores and Knowledge

A number of studies have found that student achievement improves more in classes in which the teachers have higher test scores (especially verbal ability scores) or have attended more selective undergraduate institutions (a proxy for higher ability).⁹ On average, teachers tend to score below the average of all college graduates on standardized aptitude tests.¹⁰ Using data on all graduates of the State University of New York (SUNY), we find that elementary and secondary school teachers are more likely to have scored at the lower end of the distribution than non-teachers and less likely to have scored at the upper end of the distribution. This does not mean that all teachers have low test scores. Of the SUNY graduates who entered teaching, more than one in five scored at least 600 on the verbal SAT, and more than one in five scored at least 600 on the math SAT. High school math and science teachers score higher, on average, on the math SAT than do non-teachers (43% of these teachers vs. 32% of non-teachers score above 600 on the math SAT).

Many high-scoring individuals enter teaching, but the percentage of these teachers has decreased significantly over the last forty years. As job opportunities opened up for female college graduates in occupations outside of teaching, the teacher work force lost some of its high-scoring teachers. Almost one in four new teachers in the 1960s scored in the top 10 percent of their high school graduating classes. By 1992 this number had dropped to one in ten.¹¹ This drop in teachers' qualifications as a result of improved op-

portunities for women college graduates appears to have adversely affected students.¹²

Ability (as measured by test scores) helps teachers contribute to student learning; greater content knowledge in the area in which high school teachers teach (e.g., greater physics knowledge for those teaching physics) also appears to help teachers contribute to student learning.¹³ One way for teachers to obtain content knowledge is to earn a degree in the field in which they teach. Thirty-seven percent of the degrees received by teachers in the late 1990s were in general education, and another quarter were in other areas of education, such as special education or educational administration. Only 38 percent of degrees were in traditional academic specializations.¹⁴

Teachers' academic majors vary substantially by teaching assignment. High school teachers are far more likely to have degrees in traditional academic fields (66%) than are elementary (22%) or middle school teachers (44%). In the last twenty years, there has been an increased tendency for teachers to major in traditional academic fields. Half of all teachers with three or fewer years of experience have degrees in these academic fields, compared with approximately one-third of highly experienced teachers.¹⁵ Teachers with degrees in education are more likely to enter teaching directly after completing their degree.

It is not clear whether teachers with degrees in education perform better or worse in the classroom. Of the SUNY graduates taking teacher certification exams, the holders of bachelor's degrees in education tend to have scored lower on both the math SAT (about 0.11 standard deviations) and the verbal SAT (about 0.15 standard deviations). However, course work in pedagogy, in addition to content, appears to increase teacher effectiveness at improving student test scores, and education majors are more likely to have taken these courses.¹⁶

Teachers with a degree in a specific academic field can use their content knowledge to aid their students if they are teaching in their area of expertise. Most teachers have a graduate or undergraduate major or minor in their main teaching field, although the percentage differs by disciplinary area. The percentage of teachers with a major or minor in their primary teaching field is somewhat lower for mathematics teachers than for teachers in other subject areas. It is also lower in the seventh and eighth grades than in the high school grades. Many teachers teach some classes outside of their main teaching assignment and are much less likely to hold a major or minor in these areas. As a result, almost one-quarter of seventh- through twelfth-grade classes in core academic fields are taught by teachers without a major

or minor in that field.¹⁷ This phenomenon has been diminishing, however: in 1993–1994, only 77 percent of seventh- through twelfth-grade math teachers had an undergraduate major or minor in math, compared with 82 percent in 1997–1998.

Summary

Teachers are a diverse group, demonstrating a range of academic performance and preparation. Yet we know little about the implications of this heterogeneity for student outcomes. Though higher test scores, subject-matter knowledge, and course-taking are correlated with effective teaching, research provides little additional insight into how to improve certification and recruitment policies. What characteristics of preservice education are important? What types of general knowledge should teachers have?

The lack of appropriate data for estimating the effectiveness of teachers is partly responsible for this shortfall in evidence. Teachers decide whether and where to teach and what types of training to receive; thus, when estimating the effects of education or certification, it is important to distinguish the teachers who are choosing the program from the effect of the program itself. For example, teachers educated in one program may perform better in the classroom than teachers from another program, but this difference may be due to the characteristics of individuals entering the program, not the contribution of the program. Analyses that distinguish program effects from the selection of teachers into programs require both detailed data and an understanding of the factors affecting teachers' program selection.

Recent efforts to compile state administrative information have produced the most promising results. A few states have administrative data that link teachers to the students in their classrooms, a link that is important for assessing teacher contributions to student learning. Studies with this data tend to show that measured characteristics of teachers explain only a little of the variation in students' test-score gains. However, the measures characterizing teachers are crude; thus, we cannot know whether other measurable (though unmeasured) characteristics such as test scores, coursework, professional development, and prior work experience are important for explaining student learning. Other states collect more information on teacher backgrounds but do not link teacher data to student data, thus precluding us from estimating the effects of teacher characteristics on student learning. Yet administrative data sets from states and some large metropolitan areas are still the most promising source of information on teacher effectiveness and may soon put us in a better position to know what characteristics are important for successful classroom teaching in different environments.

WHERE TEACHERS TEACH

The average characteristics of teachers differ dramatically across schools. High-poverty, low-performing schools with a high proportion of non-white students consistently have teachers with less experience and lower test scores than other schools. This sorting of teachers is discernable at the state and city level, but it is especially dramatic when broken down by school type. Here we summarize the information available on the distribution of teachers by selected school characteristics.

We begin by looking at the distribution across large metropolitan areas, then focus on the variability of teacher characteristics across individual schools based on minority composition, percentage of students living in poverty, and test-score performance. While we do not have clear estimates of the effect of this sorting, given our lack of knowledge about the impact of teacher qualifications, the differences in characteristics of teachers across schools may have ramifications for the quality of education students receive in different schools.

There are large differences between schools at either end of the distribution of teacher qualifications. For example, in 10 percent of New York schools nearly one in five teachers has no prior teaching experience, nearly one in four is not certified in any of their assignments, and nearly one in four failed the general knowledge certification exam. In contrast, at the other end of the distribution, more than 10 percent of schools have no first-year teachers, no teachers who have failed the general knowledge exam, and no uncertified teachers.¹⁸

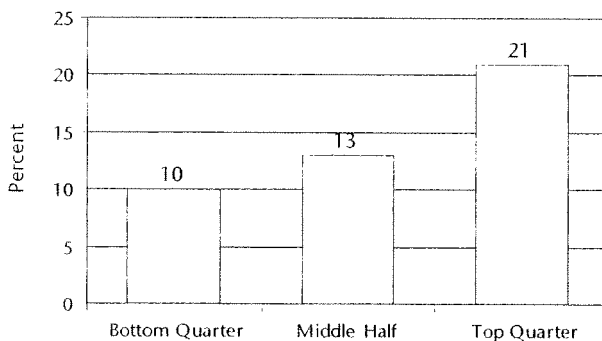
Part of these differences across schools comes from an uneven allocation across metropolitan areas, but more comes from differences across schools within metropolitan areas. Analysis of the Schools and Staffing Surveys shows that far less than a third of the variation in the selectivity of the undergraduate institution attended by the teachers, the average experience for all teachers in the district, the percentage of teachers that were newly hired, the percentage of new hires with emergency certification, and the percentage of teachers with five or fewer years of experience who plan to teach in the district the following year is between metropolitan areas. The rest of the variation is across districts within the same metropolitan area. Thus, much of the inequality across schools is local in nature rather than national. There are, for example, greater differences in the quality of teachers among the school districts in the Phoenix area than there are between the very different metropolitan areas of Phoenix and Detroit. The distribution of teachers appears to be driven by the forces in a local, not national, teacher labor market.

Part of the differences in teacher qualifications across schools within a city corresponds to differences in student populations. Fifteen percent of teachers work in schools with greater than 80 percent minority enrollment. These schools have more teachers in their first three years of teaching, more teachers with less than ten years' experience, and fewer teachers with more than twenty years' experience. They also have the lowest percentage of teachers with certification in their primary or secondary teaching assignment.¹⁹

Disparities in the distribution of teacher characteristics within some large urban school districts are even greater than these numbers suggest. In New York City, for example, 26 percent of non-white students have teachers who failed the general knowledge certification exam, compared to 16 percent of white students. Twenty-one percent of non-white students have teachers who are not certified in any subject taught, compared to 15 percent of white students.²⁰

Similarly, poor students' teachers are less qualified than non-poor students' teachers. In the New York City school district, 22 percent of poor students have teachers who are not certified in any subject they teach, and 30 percent have teachers who failed the certification exam, compared to 17 percent and 21 percent, respectively, of non-poor students.²¹ Figure 1 shows that, nationally, only one out of ten teachers in low-poverty schools are in

FIGURE 1 Percentage of Teachers with Three or Fewer Years of Experience by the Poverty Composition of the Students (Free or Reduced-Price Lunch), 1998



Source: Fast Response Survey System, Teacher Survey on Professional Development and Training, 1998. Found in, "Monitoring School Quality: An Indicators Report," December 2000; NCES 2001-030 (Fig. 2.3).

TABLE 1 Average School Attributes of Teachers by Student Test Score

Teacher Quality Attributes	Percentage of Students at Level 1 on 4th Grade ELA			
	0	0% to <5%	5% to <20%	>20%
% with no teaching experience	0.06	0.07	0.09	0.14
% not certified in any assignment	0.03	0.04	0.09	0.22
% failing NTE gen. now. or NYS lib. Arts Exam	0.09	0.10	0.19	0.35
% BA from most competitive college	0.11	0.11	0.09	0.08
% BA from least competitive college	0.10	0.11	0.16	0.26

Source: Hamilton Lankford, Susanna Loeb, and James Wyckoff, "Teacher Sorting and the Plight of Urban Schools: A Descriptive Analysis," *Education Evaluation and Policy Analysis* 24, no. 1 (2002), 37-62.

their first three years of teaching, compared with more than one in five teachers in high-poverty schools. In addition, 91 percent of teachers in low-poverty high schools report having an undergraduate or graduate major or minor in their main teaching assignment field, while just 81 percent of those in higher-poverty schools do.²²

Similar trends hold for student performance. Table 1 shows that, in New York schools where more than 20 percent of the students performed at the lowest level on the fourth-grade English Language Arts (ELA) exam, 35 percent of the teachers had failed the general-knowledge portion of the certification exam at least once. In comparison, there was just a 9 percent failure rate among teachers in schools where none of the students scored at the lowest level on the state's fourth-grade ELA exam. Statistics on the other teacher attributes are equally dramatic. There are more teachers with no experience, no certification in their assignment areas, and degrees from the least competitive colleges in the lowest performing schools

These national and state-level statistics illustrate the distribution of the least-qualified teachers into schools with the highest minority enrollments, largest low-income enrollments, and the most academically disadvantaged students. This distribution of teachers is the result of forces including the institutional structure of the school systems and administrators' tastes and abilities, but much of it reflects the dynamics of teacher labor markets and teachers' career choices.

Teacher Preferences

Not all teachers follow the patterns described above. Some high-ability teachers choose to teach in low-performing schools, reflecting unmeasured forces and preferences that differ from the average. In the aggregate, however, potential teachers are more likely to choose teaching and a specific teaching job if conditions are favorable. They are likely to prefer specific types of districts to others and to prefer one school to another within a district if conditions are appealing. This section describes the job attributes that appear important to teachers. In particular, it looks at three powerful predictors of teacher career decisions: wages, nonwage job attributes, and distance from home to available teaching jobs.

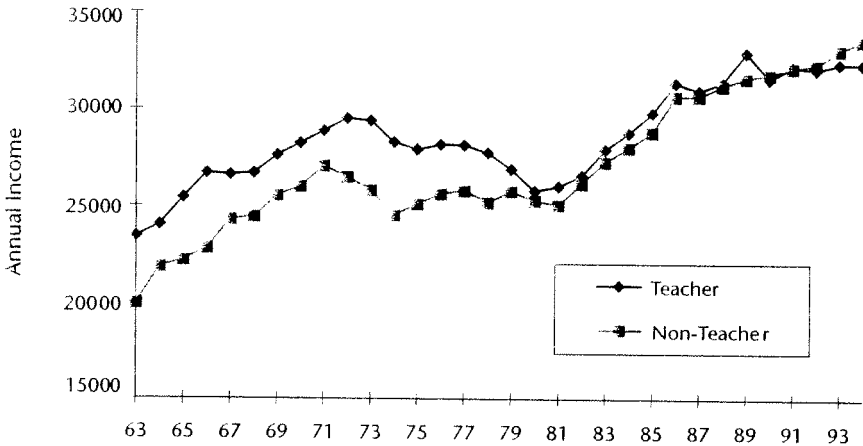
Wages

A large literature suggests that teachers respond to wages and are more likely to choose to teach when starting teachers' wages are high relative to wages in other occupations.²³ In fact, teachers appear at least as responsive to wages in their decisions to quit teaching as are workers in other occupations.²⁴ In 1999–2000, the average beginning teacher without a master's degree earned just under \$26,000; those with an MA earned just over \$28,000.²⁵ For additional education and years of experience, salaries increase; the top teacher salaries average about \$49,000 per year across districts.

Teacher wages are low relative to the wages of full-time college graduates in other occupations. Teachers' salaries are close to those of social workers, ministers, and clerical staff. Lawyers, doctors, scientists, and engineers earn substantially more, as do managers and sales and financial service workers. Fewer workdays may partially compensate for these differences, but teaching is simply not a lucrative option for a college graduate with career opportunities in other occupations.²⁶ Whether teachers should be paid more is a normative question.²⁷

Figure 2 shows that teacher wages have increased dramatically in real terms over the past forty years. There was a large increase in the 1960s as the baby-boom generation entered school, followed by a decrease in the 1970s as the school-age population dropped. In the 1980s, salaries rose again and remained relatively constant through the 1990s. However, when considering whether to enter the teaching profession, individuals are likely to look not only at the salaries they can expect as a teacher, but also at the salaries available in other occupations. Increases in teacher salaries in the 1960s and 1980s corresponded to similar increases in wages for non-teaching college graduates. In fact, as the figure shows, the salaries of teachers have lost

FIGURE 2 Mean Wage and Salary Income for Women College Graduates (1994 dollars)



Source: 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, no. 3 (2000).

ground relative to non-teaching jobs for women college graduates since the 1970s. Although the real wages of teachers grew substantially during the period, the actual opportunity cost associated with teaching (in terms of foregone wages) increased.

Salaries affect not only whether an individual chooses to be a teacher, but also which district he or she chooses to teach in. There is significant wage variation across districts. When assessing whether this variation influences teachers' job choices, it is important to consider the variation among the districts that an individual teacher might choose. Many teachers choose among districts within a relatively small geographic area; thus, differences in salaries among metropolitan areas may be less relevant for teachers' decisions than differences in wages within an area. Most wage variation is across, not within, metropolitan areas in the United States, although some metropolitan areas do have large salary differences across districts. This large interregional wage variation contrasts with variation in the qualifications of teachers, which is largely within, not between, metropolitan areas.

A number of factors may explain the variation in teacher salaries across regions, including differences in tastes for education. The wages available to potential teachers in non-teaching jobs appear particularly important: more than half of the variation in wages across metropolitan areas can be explained solely by differences in the wages of non-teachers.²⁸ This finding, combined with the difference between the real wages and the opportunity costs of teaching, shows that variation in teacher wages may not reflect differences in the wage benefits of teaching if they are not considered in the context of alternative opportunities.

There is some systematic variation in salaries related to districts' characteristics.²⁹ The 1993–1994 Schools and Staffing Surveys showed that districts with higher proportions of free-lunch-eligible students tend to pay lower salaries, but the effect is small. There appears to be no evident difference in district wages based on the percentage of Hispanic students in a district, but districts with 30 percent or more black students pay approximately \$1,500 per year less for experienced teachers, holding other factors constant. Larger districts tended to pay higher salaries than smaller districts, although this trend does not hold for the very largest districts. Small towns and rural areas within larger metropolitan areas tend to pay lower wages than their urban or suburban counterparts. There is also some evidence that districts in the suburbs of large cities tend to pay higher wages than their urban or rural counterparts, though this is not true in all metropolitan areas (e.g., Rochester, N.Y.).³⁰

In summary, teachers appear to respond to wage levels and are likely to look not only at the salaries they can expect as a teacher, but also at the salaries in other available occupations. Teacher salaries are low relative to those of lawyers, doctors, scientists, engineers, managers, and sales and financial service workers, and on a par with those of social workers, ministers, and clerical staff. Much of the variation in teacher wages across districts comes from differences in average wages across metropolitan areas, not from differences within these areas, and can be attributed largely to differences in the wages of other occupations in those areas. Yet there are still some substantial differences in wages across districts within metropolitan areas. Districts with higher proportions of free-lunch-eligible students, for example, paid lower salaries, although the effect is small. Private schools also tend to pay less than public schools.

Nonwage Job Characteristics

Salaries are only one element of employment affecting decisions about whether and where to teach. Many nonwage job characteristics likely affect

teacher preferences, including attributes of students, class size, school culture, facilities, leadership, and safety. Multiple studies have found indications that teachers prefer to teach in schools with higher-achieving students. For example, when class-size reduction in California resulted in an increase in demand for teachers across the state, teachers in schools with low-achieving students moved to higher-achieving schools.³¹ Similarly, studies have found that when teachers switch schools, they are more likely to move to schools with higher-achieving students.³²

Among the reasons teachers choose schools with more high-achieving and wealthy students is that these schools have other characteristics, such as better facilities or more preparation time, that teachers prefer. A recent survey of California teachers shows that turnover is a greater problem and vacancies harder to fill in schools with larger classes where teachers share classrooms (multitracking), or where teachers perceive the working conditions to be less favorable.³³ Principals also strongly affect the working conditions in a school; some principals are better able to create environments that teachers find favorable.

Working conditions may be more important than salaries in determining the current distribution of teachers across schools.³⁴ Differences across schools in nonwage attributes of the job will be particularly important when there is little variation in wages, which, as we have shown above, is the case in many metropolitan areas. However, the relative importance of nonwage job attributes does not rule out the possibility that salary differences could be used to compensate teachers for less favorable working conditions and thus provide incentives toward equalizing the distribution of teachers across schools. Working conditions can also act as incentives to attract high-quality teachers. Policies can attract effective administrators, increase preparation time, decrease class size, or provide funds to renovate facilities—all aspects that add to teachers' perceptions of good working conditions.

Location

In addition to wages and working conditions, school location has a strong influence on the distribution of teachers, although it has received much less attention in discussions of teacher preferences. Most teachers prefer to teach close to where they grew up and in districts similar to the district where they attended high school. This preference for home is likely true for workers in other professions as well, but it has particular ramifications for elementary and secondary schooling.

Table 2 shows that most public school teachers take their first public school teaching job very close to either their home town or their college.

TABLE 2 Distance from Home to Most Recent College, and Home to First Job, 1997–2002

<i>Distance (in miles) from home to job</i>		<i>Distance (in miles) from home to college</i>				
		<i>0–15</i>	<i>15–40</i>	<i>40–100</i>	<i>≥100</i>	<i>All</i>
<i>0–15</i>	% col total	75.6	55.2	49.4	48.0	61.0
	% row total	51.0	17.8	12.3	18.8	100.0
<i>15–40</i>	% col total	20.1	34.2	20.8	24.0	23.9
	% row total	34.7	28.1	13.2	24.0	100.0
<i>40–100</i>	% col total	2.8	8.1	23.7	8.9	8.5
	% row total	13.8	18.8	42.3	25.1	100.0
<i>≥100</i>	% col total	1.4	2.5	6.2	19.1	6.6
	% row total	8.9	7.6	14.2	69.4	100.0
<i>All</i>	% <i>N</i>	41.2	19.7	15.2	23.9	100.0
	<i>N</i>	15,891	7,598	5,861	9,238	38,588

Source: Donald Boyd, Hamilton Lankford, Susanna Loeb, and James Wyckoff, "The Draw of Home: How Teachers' Preferences for Proximity Disadvantage Urban Schools," NBER working paper 9953 (2003).

Sixty-one percent of teachers entering public school teaching in New York State from 1999 to 2002 started teaching in a school district located within fifteen miles of the district from which they graduated high school. Eighty-five percent entered teaching within forty miles of their high school. Even teachers who go far away to college tend to come home to teach: almost half of those who attended college more than 100 miles from where they went to high school returned to within fifteen miles of their high school district for their first teaching job.

These patterns may reflect more than just a preference for proximity. For example, individuals may search for employment in regions where they are comfortable, independent of the distance from their home town. Teachers appear to prefer to teach in regions similar to the one they grew up in, if not the same region. Teachers growing up in an urban area are much more likely to teach in an urban area, and those growing up in a suburban area are more likely to teach in a suburb. More than 90 percent of the teachers whose

home town is New York City and who entered public school teaching from 1999 to 2002 first taught in New York City. About 60 percent of those having home towns in the New York City suburbs first taught in those suburbs. Other major urban areas in New York State follow a similar pattern.

Teachers' preferences for teaching close to home or in similar settings pose particular challenges to urban districts, which are net importers of teachers. Urban areas often do not produce as high a proportion of college graduates as suburban areas. Thus, the number of teacher recruits whose home town is urban tends to fall far short of the number of positions that need to be filled in urban districts, so these districts must attract teachers from other regions. Teacher candidates from suburban or rural home towns strongly prefer to remain in those areas. Thus, urban districts must overcome location preferences in addition to addressing the considerations typically identified with recruiting teachers to hard-to-staff urban schools: salary, school conditions, and characteristics of the student population. In general, urban schools must offer salaries, working conditions, or student populations that are more attractive than those of surrounding suburban districts to induce enough qualified candidates from suburban home towns to take jobs farther from home and in a different type of town. To the extent they do not receive these inducements, teachers with suburban home towns who take jobs in urban areas are likely to be less qualified than those who teach in the suburbs.

Urban districts often face a second disadvantage. Historically, the graduates of urban high schools do not receive adequate educations. Preferences for proximity lead to the perpetuation of inequities in the qualifications of teachers, insofar as these preferences present cities with a less qualified pool of potential teachers. The local nature of the teacher labor market increases the difficulty of breaking the cycle of inadequate education.

USING LABOR MARKETS TO UNDERSTAND TEACHER POLICIES

Two types of policies aim to address teacher supply. One type seeks to influence the supply of teachers through changing recruitment strategies; the other seeks to improve the quality of the supply of teachers by raising standards for entering teachers. Here we address some of the strengths and weaknesses of each approach.

Improving Recruitment Strategies

Recruiting highly skilled teachers requires a pool of able teachers from which to hire. It also requires the use of effective hiring practices to identify

the most capable teachers within that pool. Recruitment policies then seek to increase supply and improve the hiring process.

Increasing Supply

A number of policy approaches can increase the quantity and quality of teachers in the hiring pool. Schools can act to improve working conditions through lowering class sizes, providing more mentors and coaches, or providing more material resources. They may also hire strong leaders to help create a positive school climate. Salary increases are a common approach (although perhaps not the most effective) to increasing supply.

An increase in wages increases supply. Similarly, a downturn in job stability or wages in other occupations improves the supply of teachers. Although evidence from the 1980s shows that increases in teacher wages were not accompanied by corresponding increases in the supply of teachers,³⁵ this was largely because the wages for non-teaching women college graduates outpaced teacher wage gains during this time. An increase in teacher wages that exceeds increases in other fields is likely to improve the supply of teachers.

Despite these basic labor market dynamics, policies that increase wages for all teachers (or decrease wages in other occupations) may not be the most effective means for increasing or improving the supply of teachers, for two reasons. First, since most teachers have been teaching for many years, an across-the-board salary increase will largely benefit those teachers who are already working in the schools. This may not be a bad policy if it improves the efforts of teachers already in the schools or decreases attrition among highly effective teachers, but it isn't the most effective way to direct funds toward individuals who are currently choosing whether to enter teaching. Second, most districts operate under a single salary schedule, paying all teachers with similar education and experience the same salary. Thus, increasing salaries means increasing them for all schools within a district. Many schools do not have difficulty recruiting teachers, and those that do may only have trouble finding teachers for particular fields. The problems with across-the-board salary increases are particularly acute due to the scale of the labor market for teachers. At the turn of the twenty-first century, approximately three million college graduates, representing almost 10 percent of all working college graduates, were teaching in elementary and secondary schools in the United States. Increasing wages for teachers who are not difficult to recruit may be a misallocation of scarce resources.

Schools may be difficult to staff because of their student body characteristics or, as noted above, because they are located in regions that produce few college graduates who are potential teachers for schools there. Policies that

do not target the particular schools or subject areas with teacher shortages may increase overall supply, but will only marginally affect either the areas with shortages or the distribution of teachers across schools, because they will not make these traditionally hard-to-staff schools *relatively* more appealing. Targeted wage increases for hard-to-staff schools, especially if they are substantial, are likely to be more effective. Similarly, policies that target potential teachers with needed skills are likely to reduce shortages more effectively than generalized salary increases.

Another aspect of the recruitment debate is whether to increase salaries based on performance. By paying more to teachers who perform better in the classroom, schools may encourage the entry of more skilled teachers and increase the effort of teachers already in the classroom. The difficulty of basing pay on performance is in deciding what constitutes merit. Some policymakers advocate basing teacher pay on the test-score gains of their students, but there are significant difficulties with this. First, most tests do not cover the broad range of skills that teachers cover in the classroom. Second, such a system would encourage teachers to focus instruction on material contained in the test—"teaching to the test"—and neglect other important areas of the curriculum. Third, the policy may encourage cheating and discourage collaboration among teachers. Collaboration and mentoring are particularly important for new teachers. Policies that discourage teacher interaction may increase the time it takes for new teachers to become effective, and it may also contribute to turnover if these new teachers are dissatisfied with their abilities in the classroom.

A second type of merit pay plan would give principals discretion to disperse bonuses. In a system with high-quality administrators, this would have the benefit of rewarding classroom effectiveness while avoiding testing problems. Principals may also be given discretion to target bonuses to teachers in subject areas that are hard to staff. However, many factors that plague the teacher labor market affect the administrator work force as well. In the 1999–2000 academic year, New York City schools were more than 50 percent more likely to have a new principal than were schools in the surrounding suburbs. Inexperienced administrators may not have the skills to use discretionary funds wisely. It is unclear whether principal discretion is the most effective mechanism for increasing the quality of teaching in the schools; with a concerted effort to improve school administration, it may be in the future.³⁶

When budget constraints limit the size of across-the-board salary increases, targeting funds to high-needs schools and shortage areas is likely to be more effective than nontargeted reforms, especially at the state level. Yet

many recent efforts to increase teacher salaries have not been targeted. Thirty-five states currently provide retention bonuses for teachers.³⁷ Five of these states target these bonuses to teachers in high-need schools. Six states have instituted housing incentives, and another five have signing bonuses for new teachers, but only three states target their housing incentives and two target their signing bonuses. Individual districts also use differentiated wage and benefit structures to attract teachers. Out of thirty large school districts, ten give signing bonuses for new teachers and nine give housing incentives. Three of the ten districts that give signing bonuses target them to high-need schools, as do two of the nine districts offering housing incentives.³⁸

Wage-based approaches are popular but may not be sufficient or efficient in attracting high-quality teachers or equalizing the distribution of teachers across schools. Improvements in working conditions may be a less costly approach. Capital improvements in schools and better provision of supplies might help attract and retain teachers. Attracting effective leaders is also an important component of a broader policy to improve the quality of teachers' working conditions, and therefore of teachers. Effective leaders often can improve school environments by putting in place support systems for teachers, creating lively learning environments, and allocating resources effectively.

Improving the Hiring Process

Teachers' decisions are not the only factors affecting the composition and distribution of the teacher work force. The quality of district hiring and assignment practices is likely to contribute to the disparities in teacher qualifications across schools and districts. Some administrators operate inefficiently and are unable to hire highly qualified individuals who are willing to teach in their schools. Many of the districts with the least qualified teachers hire their new teachers very late in the summer or even in the fall. Districts that hire earlier are able to recruit their top choices; other districts are left with teachers that could not find jobs elsewhere.³⁹

Schools with ineffective administration or weak parent participation may be at the whim of district administrators, and their teacher work force may suffer. For example, schools with strong parental input may not accept low-quality teachers. When parents and students complain about poor teachers, the teachers may be transferred to schools with high student transfer rates, large numbers of students receiving free or reduced-price lunches, and large numbers of minority students, where parental pressure may not be as strong.⁴⁰ Inefficient hiring procedures and lack of power in the district may

be compounded if administrators cannot identify the most qualified teachers from the pool of teacher applicants, or if they do not hire these teachers when they have the opportunity.

It is difficult to tell how pervasive these problems are. Few studies give us an in-depth view of the hiring process, and these studies tend to describe only a small number of districts. One indication that schools are not hiring the best available candidates is that many highly capable individuals (e.g., those who attended selective undergraduate institutions) apply for teaching jobs but don't end up teaching, while many less qualified individuals do end up teaching.⁴¹ There are three possible explanations for this phenomenon. First, districts may not select the most highly qualified individuals available to them. Second, these highly qualified teaching applicants may apply only to the most selective schools, most likely high-achieving suburban schools. If they do not get these jobs, they then seek jobs in other occupations rather than in other schools. Third, schools may choose teachers by other, unmeasured characteristics.⁴² We do not yet understand which of these phenomena predominate. A recent study of New York schools and teachers suggests that when given their choice of teachers, schools on average choose teachers with higher test performance, but the study does not address whether this is true specifically in schools serving poor or low-performing students.⁴³

In summary, hiring practices in some districts are not efficient and thus these districts are not hiring as highly skilled teachers as they could. It is also clear that the pool of potential teachers differs across districts and that this supply problem is partly to blame for differences in the characteristics of teachers across schools.

Raising Requirements

Improving recruitment, either through better administration or increasing wage and nonwage benefits, is one approach to improving teaching; changing certification and education requirements is an alternative. Raising requirements for entry into teaching has three potential effects. First, additional education may improve skills and prepare potential teachers for the difficulties of classroom teaching, thus creating a more stable, skilled work force. High teacher turnover, exacerbated by poor preparation, is costly to districts, both because first- and second-year teachers often are less effective with students than more experienced teachers and because there are direct recruitment and hiring costs.

A second potential effect of raising requirements is that potential teachers who do not meet a minimum standard of competency will be barred

from the work force. Most states require teachers to pass exams on general knowledge and teaching practice. In 2002, for example, forty-four states required potential teachers to take written tests in order to receive a beginning teacher license.⁴⁴

Although policies that raise requirements have these potentially positive effects, the additional requirements represent barriers to entry that may keep highly skilled individuals away from the classroom. Coursework takes substantial time, a high cost for individuals who could use that time to earn money in other occupations. Increased barriers may be a particular problem for schools that traditionally have had the most difficulty attracting teachers, as well as for the most able individuals interested in teaching. The schools, often with high proportions of poor and low-performing students, face a small pool of possible hires, and increased requirements reduce this pool even more. Insofar as new requirements weed out the worst candidates, provide schools and districts with additional information, and keep them from making poor choices, this may be a beneficial policy. However, to the extent that the new requirements do not accurately identify good teachers and administrators are effectively choosing from the pool of candidates available to them, increased requirements may eliminate some of the better candidates from an already insufficient pool and disadvantage these schools to an even greater extent.

Barriers may also be a particular problem for high-ability teaching candidates, who have ample alternative opportunities. These individuals may be more likely to be on the fence between entering teaching and choosing another career, likely one with higher wages. A test may not present a high barrier to these potential teachers, but additional education requirements that require time investments may. If these potential teachers are unsure of their career choice, they may be unwilling to try teaching if they need to invest substantial time before entering the classroom, especially if that investment has little return in labor markets in other fields.

Sensitivity to barriers may also be particularly strong for individuals who come to teaching from other careers. While many teachers enter the classroom directly from college, more and more enter later in their careers. More than 80 percent of first-year teachers in New York State in 1970 were under twenty-five years of age. By the mid-1980s this number had decreased to roughly 40 percent and has continued to slowly decline ever since. Nationally, approximately one-quarter of first-year teachers are less than twenty-five years of age, but about one-seventh are forty years of age or older. These later entrants may be sensitive to tests if they have been out of school and away from testing (older entrants in New York State tend to score lower on

tests than younger entrants), and they may be sensitive to education requirements if they need to continue to support families as they switch careers.

Sensible preparation requirements seek to minimize the costs of entry for teachers while providing the skills they need to be successful in the classroom. Current preparation programs may not be as effective as they should be, especially for low-performing schools. They rarely provide training on the specific issues involved in teaching in these schools, and they do not include mentoring programs that follow new teachers into the classroom and support their development. However, there is virtually no information on what aspects of teacher preparation *would* help teachers—key information for designing requirements that are effective for improving teacher performance but not onerous for individuals considering a teaching career.

Partly because the impact of education and certification requirements on student outcomes is not well understood, as well as the strong belief that these requirements limit the supply of teachers, many states have implemented alternative certification programs aimed at reducing the barriers to entry for college graduates interested in teaching. All but six states have some kind of alternate route program to recruit, train, and certify teachers. Twenty-four states and the District of Columbia have structured alternate route programs with preservice training and mentoring components. Eighteen of the programs require entrants to pass a basic skills or subject-area test. Alternate route programs in twelve states and the District of Columbia also require some classroom training before candidates are assigned to their own classes. These programs mimic teacher-education programs by providing classroom training for teachers, but do not require substantial time investment prior to entering the classroom.⁴⁵ They tend to backload the course requirements so that teachers can earn a salary while taking the coursework. To supplement the alternate routes into teaching, more districts are implementing induction programs that help teachers in their first years of teaching. In 1997–1998, 65 percent of teachers in their first three years of teaching had participated in such programs in their first year of teaching, compared with only 14 percent of those with twenty or more years of experience.

As is the case with other important teacher supply policies, we have little evidence regarding the success of alternate route or induction programs in attracting and retaining high-quality teachers. Not all alternate routes are alike; some offer preservice coursework very similar to that provided by traditional routes, while others feature little coursework or exposure to students and schools prior to entry into the classroom.

Attracting more able college graduates into teaching is an important policy goal. The number of teachers needed in our schools is tremendous, and our ability to raise teacher salaries to compete with other professions is limited. Good policies must address the needs and abilities of the individuals interested in teaching within constraints. Areas that have had poor schools in the past and do not produce enough high-scoring college graduates may face a work force without the ideal skills.⁴⁶ Education and certification requirements may improve these skills. Similarly, highly skilled candidates from other locations may not have the skills necessary to teach in environments that are very different from the ones in which they grew up. Teacher education may help provide these skills as well. The trick is to understand what types of education are effective, how to create requirements that do not weaken the teacher work force by keeping away high-quality candidates, and how to structure schools to make the best use of the candidates available to them.

DISCUSSION AND CONCLUSION

Researchers have learned a great deal about what matters in education. For example, demography is not destiny; effective teachers can and do overcome many of the hurdles facing disadvantaged students and can have a great impact on how much students learn. However, a weak research base limits our ability to design cost-effective teacher certification and recruitment policies. We have only rudimentary information on the connection between observable teacher attributes and effective teaching. Similarly, while we know wages, location, and other nonpecuniary aspects of teaching are important for teachers' decisions, we do not know the relative importance of these factors in influencing individuals' decisions to enter teaching or to seek specific teaching jobs. Moreover, though we know that some preparation can improve teaching, we do not know which aspects of preparation are important in preparing effective teachers, nor how much the entry barriers created by additional requirements reduce the entry of highly qualified teachers or unnecessarily reduce the applicant pool for hard-to-staff schools.

Researchers working closely with state and local education agencies have begun to develop databases that will support research to address many of these policy issues. These efforts are characterized by linking student value-added test results to the attributes of the teachers who taught them. A number of policy questions can be informed by examining the variation across teacher attributes that exist within and across districts within a state. For ex-

ample, the variation in the structure and content of teacher-preparation programs, combined with controls for other relevant factors, can be used to identify the effect of various components of teacher preparation. This research is just beginning.

What advice can researchers offer policymakers amid this uncertainty? First, when trying to solve specific problems such as shortages of math teachers or highly qualified teachers in low-performing schools, don't use the sledgehammer of raising salaries for all. It is extremely expensive and doesn't change relative wages. Rather, adopt policies targeted to the problem at hand, even if it means modifying the usual approach to teacher salary contracts or supplementing uniform local contract wages with more flexible state funds. Reserve general salary increases, where needed, for making the teaching profession more attractive than the alternatives. Second, recognize that salaries are not the only important policy tool. Better working conditions and improved recruitment and hiring practices can help schools and districts attract and retain high-quality teachers. Third, be cautious about imposing new teacher-qualification requirements and teacher-preparation program requirements. Given how little researchers know about what works and what doesn't, there is a danger of imposing new requirements that exclude or discourage potentially capable teachers, while doing little to raise the quality of those included. Requirements should aim to balance the benefits of greater preparation with the possibly dissuading effect of greater time requirements.