



I

INTRODUCTION

A great teacher can make a huge difference in the lives of students—if she’s teaching in their school. But many schools have difficulty attracting and retaining highly effective teachers. This difficulty is particularly pronounced in schools with low-income and low-achieving students. These schools systematically employ less experienced teachers with weak educational background and academic skills.

Strategies to address these shortcomings in the teacher workforce generally focus on four areas:

- ◆ *recruitment* of individuals with the potential for highly effective teaching;
- ◆ *training* of teachers and potential teachers to improve their ability in the classroom;
- ◆ *incentives* for teachers to increase and target their effort to improve student outcomes;
- ◆ *retention* of the most able teachers.

Each of these approaches requires policies that can influence the decisions of teachers and of individuals who are considering becoming teachers. For this reason, policy initiatives will be more effective if they consider *up front* the likely responses of relevant individuals to the changes they propose.

Economic theory can provide a framework for understanding and predicting how individuals respond to policy change. It considers how individuals make choices given what they care about and the constraints they face in terms of money, time and information. This report adopts an economic framework and provides information on what we know about teachers’ preferences and constraints. It describes the current teaching force and the systematic sorting of teachers across schools, based on those preferences and constraints. It asks what influences teachers’ decisions about whether and where to teach, focusing particularly on teachers’ wages, the non-wage characteristics of their work environments, and the location of available jobs. Ultimately, the report looks at policy approaches for strengthening the teacher workforce, with particular emphasis on recruitment and training. To be effective in improving teaching for the students most at-risk of failure, reforms must directly



To be effective in improving teaching for the students most at-risk of failure, reforms must directly target the most difficult-to-staff schools.

The conclusions expressed in the report are the authors’ own, and do not necessarily reflect the views of Michigan State University. We wish to express our thanks to Marisa Burian-Fitzgerald, Debbi Harris, Jeannie Patrick, and Chris Reimann for their help with the editing and production of the report.

target the most difficult-to-staff schools, providing incentives for both teachers and highly-effective administrators to work in these schools, as well as the supports needed for these individuals to be effective in their work.

WHO TEACHES?

To be effective, policy initiatives must take into consideration the following characteristics of the teacher workforce:

Size of the teaching force

- ◆ The teacher workforce is huge, totaling nearly three million college graduates. It has more than doubled over the past half century due to student population growth and a substantial decline in the number of students per teacher.
- ◆ Many new teachers are entering the profession because of class size reduction policies and an aging teacher workforce that has led to increases in the rate of teacher retirement. Smaller class size has been shown to benefit students, but it is an expensive policy approach and not necessarily an optimal allocation of resources.

Demographic characteristics of teachers

- ◆ The racial/ethnic composition of the teacher workforce is quite different from that of the student population. The share of non-white teachers is much smaller than the share of non-white students. Some evidence suggests that same-race teachers can be more effective for improving student outcomes, though race is clearly not the only characteristic of teachers that is important.
- ◆ Most teachers, particularly at the elementary level, are women. This has not changed dramatically over the past half century, but improving opportunities for women college graduates has meant that the relative attractiveness of teaching as a career choice for talented women has diminished.
- ◆ Differences in the characteristics of teachers across schools is largely due to the initial match of teachers to schools in their first teaching jobs, but the decisions of teachers to either transfer to another school or quit teaching altogether contribute to this sorting as well.
- ◆ The turnover rate of young teachers appears to be similar to young professionals in other occupations. Teachers with higher standardized test scores and those in the lowest performing schools are more likely to quit or transfer.

Qualifications of teachers

- ◆ Almost all teachers have bachelor's degrees and more than half of teachers have at least master's degrees as well. There is no evidence



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that having a master's degree improves a teacher's ability in the classroom.

- ◆ Almost all high school teachers have a major or a minor in the main subject area in which they teach. The greater content knowledge that may result from this specialization has been shown to positively affect high school teachers' ability to contribute to student learning.
- ◆ There is substantial variation among teachers in their academic performance. Though there are many teachers who perform well on standardized tests, on average teachers tend to score below the average for all college graduates. The average ability of teachers relative to their cohort has not changed dramatically over time, but the proportion of teachers from the very top of the test score distribution has dropped dramatically.
- ◆ Almost all teachers hold a teaching certificate. Traditionally, teachers have obtained these by taking courses and student teaching during either their undergraduate education or as part of a master's degree program.
- ◆ Many states and localities are experimenting with alternative certification programs, which either require less course work and student teaching or change the timing of these requirements so that teachers can fulfill them during their first year or two of teaching. There is great variation in the characteristics of both traditional and alternative certification programs. The current research does not provide convincing evidence as to which aspects of preparation are important for teachers in the classroom.
- ◆ Teachers receive additional training through induction programs and professional development programs. Many teachers cite induction programs as the most valuable aspect of their preparation. Some high-quality professional development programs have been shown to improve teacher effectiveness; however, we do not know whether investment in these programs is more beneficial than equal investment in other school resources, nor what aspects of these programs are particularly beneficial in a given context.

A strong research base supports the proposition that teachers are among the most important factors affecting student learning, but currently measured characteristics of teachers explain only a small part of this effect.¹ On average, teachers in their first years of teaching do not contribute as much to student learning as more experienced teachers. Teachers with higher test-scores and greater content knowledge contribute more. There is still much about what makes a good teacher that researchers have not been able to measure.

Teachers tend to score below the average for all college graduates.

WHO TEACHES WHOM?

In addition to understanding the teacher workforce as a whole, policy initiatives must account for differences in the characteristics of teachers across schools. Among the most salient features of the distribution of teachers across schools are:

- ◆ There is a systematic sorting of the least qualified teachers into schools with the highest minority enrollments, largest low-income enrollments, and the most academically disadvantaged students.
- ◆ Much of the sorting occurs within large urban districts. There is often not as much difference in the characteristics of teachers across regions as there is among schools within these districts.
- ◆ Differences in the characteristics of teachers across schools is largely due to the initial match of teachers to schools in their first teaching jobs. The decisions of teachers to either transfer to another school or quit teaching altogether contribute to this sorting as well.
- ◆ The turnover rate of young teachers appears to be similar to young professionals in other occupations. Teachers with higher standardized test scores and those in the lowest performing schools are more likely to quit or transfer.

WHAT MATTERS TO TEACHERS?

A number of factors contribute to the sorting of teachers across schools and districts. For example, some districts are more efficient in recruiting and hiring than other districts, whose practices often result in late summer job offers to teacher applicants. Teacher preferences for certain schools also contribute to differences in the characteristics of teachers across schools. Teacher preferences reflect a number of considerations, including:

- ◆ **Wages:** In choosing where to teach, teachers appear to care about wages. Within a district, wages tend to vary only by the experience and education level of the teacher. Across districts wages can vary substantially, but much of this variation is across regions in the country and can be explained largely by the wages available in other occupations in the region. Within regions, there is much less wage variation, though differences between particular districts can be large.
- ◆ **Working conditions:** Teachers also care about working conditions. Working conditions across schools vary dramatically due to differences in student body composition, the character of school administration, available resources and resource allocation.
- ◆ **Location:** The location of the school also appears to be very important for teachers' decisions about where to teach. Teachers, on average,

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prefer to teach close to where they grew up or in schools similar to the ones they attended as students. This preference makes staffing difficult for schools in areas that need to import teachers, as do many large cities.

POLICIES TO IMPROVE TEACHING

The ultimate goal of this report is to use available information on the characteristics of teacher labor markets to frame and inform policy questions. The key consideration for effective policy is this:

- ◆ Policies *must target* difficult-to-staff schools. Across the board increases in wages or benefits are unlikely to improve the relative quality of teachers in difficult-to-staff schools. *Targeted* policies will undoubtedly have greater effect; however, such targeting requires flexibility in resource allocation that may be politically difficult to achieve.

The report also touches on additional areas of reform important for improving the teacher labor force:

- ◆ Improving recruitment and hiring practices. Many high-needs districts do a poor job recruiting teachers. This failure is likely to explain some, though not all, of the differences in the characteristics of teachers across schools.
- ◆ Redesigning certification requirements. The benefits of training must be balanced against the costs. Requirements should not unduly discourage more, and more qualified, individuals from becoming teachers.
- ◆ Establishing incentives and education programs to encourage individuals to enter the teaching profession in regions that produce relatively few highly-skilled college graduates.

Salary differences, regional differences in the characteristics of college graduates, alternative opportunities for potential teachers, and education and certification requirements affect the quality, quantity and distribution of teachers across regions, across districts and across schools. Researchers and policy-makers struggling to address weaknesses in the teacher workforce are handicapped because information on teachers and their preferences has not been brought together in a systematic way. This report seeks to provide an easily accessible source of information about the teacher workforce. The report itself is limited by large gaps in our understanding of how the teacher workforce operates, but it summarizes the information that we have and points to areas where further study would be particularly useful.

The report includes six chapters. After this introduction we provide a brief overview of economic principles useful for understanding the teacher workforce and teachers' responses to education policy initiatives.

PUBLIC POLICY AND TEACHER LABOR MARKETS

The third chapter describes the characteristics of the public school teacher workforce, including size, age, gender, race, educational attainment and certification. It also highlights attributes of teachers that have been linked to student outcomes. The fourth chapter explains the distribution of teachers across schools. It emphasizes teachers' initial choice of schools as a key explanation for this distribution, and also discusses teachers' subsequent decisions about whether to transfer to other schools or leave teaching. Chapter five explores factors that appear to influence prospective teacher decisions about whether and where to teach. In particular it looks at the effects of wages, working conditions and job location. The concluding chapter discusses several policy approaches that seek to improve teaching by affecting the teacher labor market. It provides recommendations on improving recruiting strategies and hiring practices and altering certification requirements for entry into teaching.

The data in this report come from multiple sources. Many of the graphs and tables are based on data collected by the National Center for Education Statistics (NCES) at the U.S. Department of Education. Because some important information on teachers is not available nationally we supplement the national data with results from previous studies, many of which use New York State's remarkably thorough teacher dataset.² State and local datasets offer essential details that allow comparisons among cities, suburbs and rural areas, high poverty and low poverty schools, and predominantly white or minority schools. These datasets often link teachers to schools and to the achievement of their students, which national datasets do not. The mix of national and state level data helps provide a more accurate picture of the teacher workforce and labor market than either national or state data could provide by themselves.





II

AN ECONOMIC APPROACH TO UNDERSTANDING THE TEACHER WORKFORCE

This section describes the economic framework we use to assess and predict policy effects. The defining feature of this framework is its focus on individual actors and the decisions they make. Important education actors operate at several different levels. At the classroom and school level there are teachers, students and their parents, support staff and administrators. At the district level there are administrators, school board members and the community members the school boards represent. At the state level, there are governors, legislators and the voters who elect them. Each of these individuals makes decisions that affect how policies influence teachers and students. These decisions are shaped by their individual preferences and the constraints they face.

PREFERENCES

Each actor has preferences guiding his or her decisions. Many of these preferences, such as an interest in the long-term well-being of students, are shared among actors. Other preferences differ across individuals. Legislators and school board members may hope to increase their political influence. Administrators may hope to increase their professional prestige or improve their working conditions. Each parent may hope that his or her child achieves success beyond that of other children.

This report focuses on teachers. Current research suggests that teachers consider salaries, working conditions and school location among other factors when making decisions about whether and where to teach. Teachers may be willing to accept lower salaries in order to teach in schools with pleasant working conditions or a desirable location. Similarly, increased wages may entice teachers to consider schools with more challenging conditions or less desirable locations. When decision-makers ignore teacher preferences, the resulting policies often have unintended and undesirable consequences. Later sections of this paper will discuss the ways teacher compensation policies that ignore teacher preferences exacerbate the current inequitable distribution of high quality teachers.

CONSTRAINTS

Preferences are not the only factor affecting individuals' decisions. We are all constrained in our choices, and teachers are no exception. For example, many teachers have working spouses and must choose

employment in a school reasonably close to the location of their spouse's employment. Teachers also face economic constraints. Their salaries must be high enough to allow them to maintain a reasonable standard of living, given their education and alternative employment opportunities.

Not all teachers face the same constraints. For example, teachers differ in their alternative employment opportunities. Teachers with strong science training, for example, may be able to find higher paying jobs outside of teaching than those with degrees in history. These individuals will decide to teach only if teaching is more enticing than their alternative opportunities. Similarly, particular fields in education, such as special education, require a great deal of specialized training before entry into the classroom. Greater compensation may be necessary to entice individuals to specialize in these fields because of the additional time and effort required.

Individuals are constrained by the knowledge available to them as well as by the resources they control. For example, policy makers at the state level have less information than school or district administrators about working conditions in a particular school which make that school less attractive for teachers. When knowledge is constrained, policies that allow some flexibility at the local level in determining how to use resources are likely to be more effective than policies that establish state level rules to govern resource allocation.

ECONOMICS IN THIS REPORT

Effective education policy considers teachers' preferences because these preferences, combined with constraints, determine teachers' actions and, ultimately, the education their students receive. While policy cannot change preferences, it can use incentives, such as bonuses or improved working conditions, to encourage teachers to make particular choices. Policy can also be used to change the constraints faced by teachers. For example, alternative certification programs may allow some individuals to consider teaching who would otherwise be unable to do so. These programs generally allow prospective teachers to enter the classroom and begin earning a salary much more quickly than traditional teacher education programs. This may allow career changers to consider teaching by enabling them to earn money while they learn to teach.



III

WHO TEACHES? THE CHARACTERISTICS AND PREPARATION OF TEACHERS

This section describes the characteristics of teachers who currently work in our classrooms. It also provides an historical perspective on the teacher labor force.

NUMBER OF TEACHERS

- ◆ The teacher workforce is huge, totaling nearly three million college graduates. It has more than doubled over the past half century due to student population growth and a substantial decline in the number of students per teacher.
- ◆ Many new teachers are entering the profession because of class size reduction policies and an aging teacher workforce that has led to increases in the rate of teacher retirement. Smaller class size has been shown to benefit students, but it is an expensive policy approach and not necessarily an optimal allocation of resources.

Nearly three million college graduates teach in elementary and secondary schools in the United States. These teachers represent almost ten percent of all working college graduates. An even larger proportion of current college graduates consider teaching after graduation. Within four years of receiving a bachelor’s degree, for example, 36 percent of the class of 1992–93 had applied for a teaching job, become certified to teach, or considered teaching. Of these young adults, more than a third had actually taught.³

These college graduates are responding to an historical trend that demands increasing numbers of teachers. The number of elementary and secondary public school teachers has grown steadily in the last half century (Figure 1). In 1955, there were 1.14 million public elementary and secondary school teachers in the United States. Nearly fifty years later, this number had nearly tripled, reaching 3 million teachers.

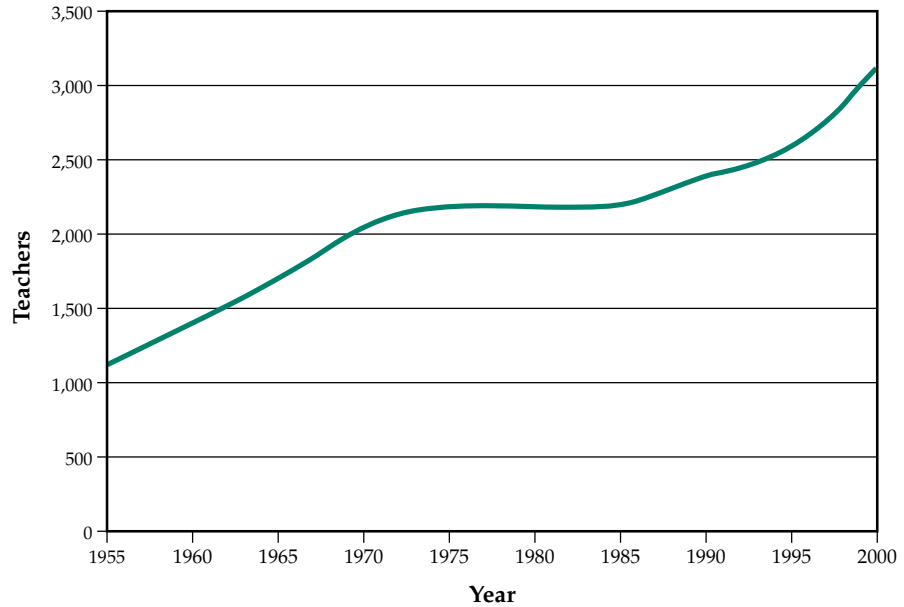
The change in the number of teachers over time reflects both increases in elementary and secondary school enrollment and decreases in the ratio of students to teachers. Enrollment increased drastically in the 1960s as students of the baby boom generation began to attend school, and then rose again in the late 1980s and early 1990s as the children of these baby boomers entered the education system (Figure 2).

Teachers represent almost ten percent of all working college graduates.





FIGURE 1
Elementary and Secondary Public School Teachers
in Thousands, 1955–2001



Source: Snyder, T. D. (2002). *Digest of Education Statistics, 2001* (NCES 2002-130). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Statistics of Public Elementary and Secondary Day Schools; Common Core of Data surveys.)

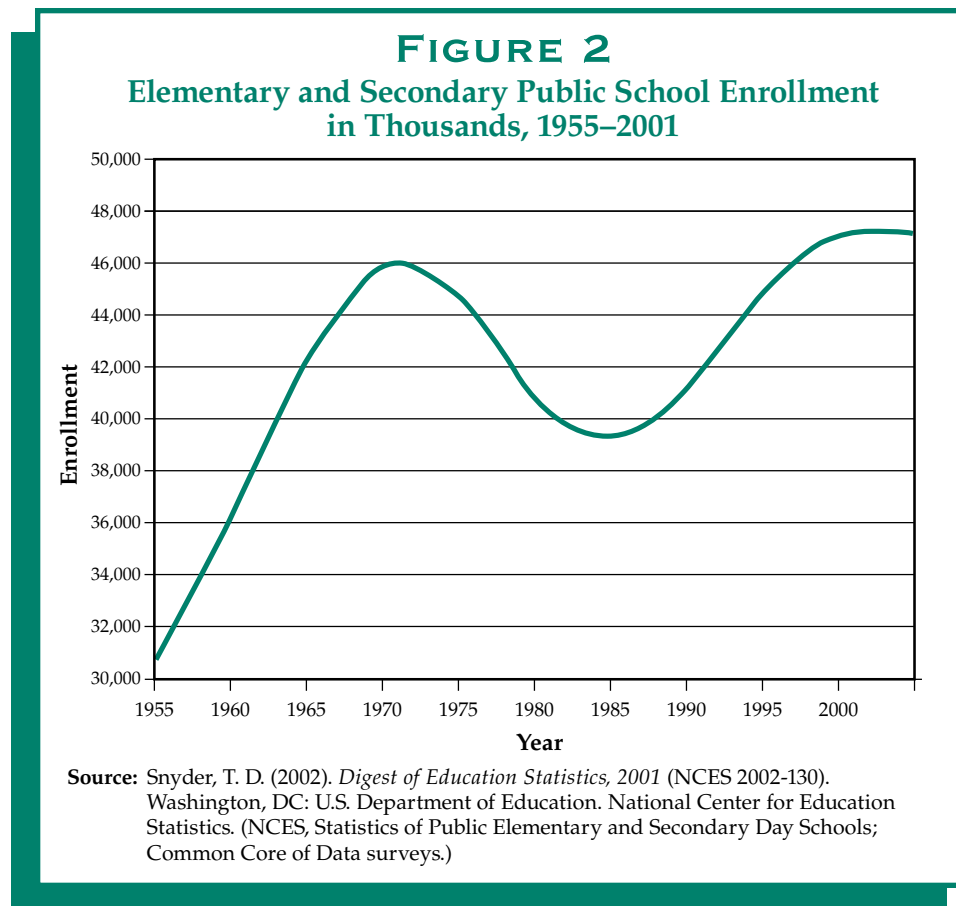
Sharp increases in the 1960s and 1990s are evident in both Figure 1 for teachers and Figure 2 for students; but while the student population dropped off in the late 1970s, the number of teachers remained nearly constant, leading to a decrease in the student-teacher ratio. From 1955 to 1990, the average number of students per teacher declined from 26.9 to 17.2. Figure 3 shows the downward trend in the student-teacher ratio throughout the second half of the 20th century, falling steadily from 1965–1990 with the most rapid decline in the late 1970s.

The decrease in the student-teacher ratio accounts for a large part of the increase in the cost of public school education over the past few decades. Small class size has been shown to increase student achievement, but we have little evidence on the effects of alternative resource allocations. It is therefore difficult to judge whether the huge quantity of resources devoted to reducing class size has been allocated in the most effective way for meeting educational goals.⁴



GENDER

- ◆ Most teachers, particularly at the elementary level, are women. This has not changed dramatically over the past half century, but improving opportunities for women college graduates has meant that



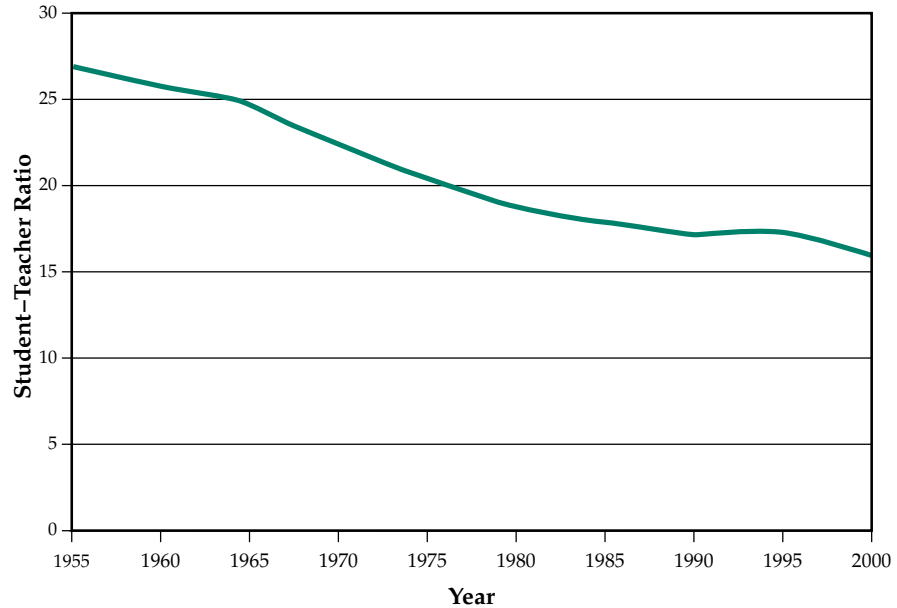
the relative attractiveness of teaching as a career choice for talented women has diminished.

Three out of four elementary and secondary school teachers are women, and the percentage increased noticeably during the 1980s and 1990s (Figure 4). In general, women make up a higher fraction of elementary school teachers than secondary school teachers. In 1996, 83 percent of elementary school teachers were women, compared with 57 percent of secondary school teachers. Although the share of women teachers has changed very little over the last 50 years, the share of women college graduates entering the teacher labor market has dropped dramatically. This shift is largely due to vast increases in the number of women obtaining bachelor’s degrees. In the mid-1960s, less than ten percent of women between the ages of 25 and 34 had obtained a bachelor’s degree. By the mid-1990s, however, more than 1 in 4 women completed college. In 1964, over half of working female college graduates were teachers, but this percentage had fallen to less than 15 percent in 1996.⁵

In addition to large increases in the number of women college graduates, the last 30 years have seen substantial gains in the wages available to women in non-teaching fields. This change in opportunities has affected the characteristics of women in the teacher workforce, as we discuss further below.

In 1964, over half of working female college graduates were teachers, but this percentage had fallen to less than 15 percent in 1996.

FIGURE 3
Student-Teacher Ratio in Elementary and Secondary Public Schools, 1955–2001



Source: Snyder, T. D. (2002). *Digest of Education Statistics, 2001* (NCES 2002-130). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Statistics of Public Elementary and Secondary Day Schools; Common Core of Data surveys.)



AGE AND EXPERIENCE

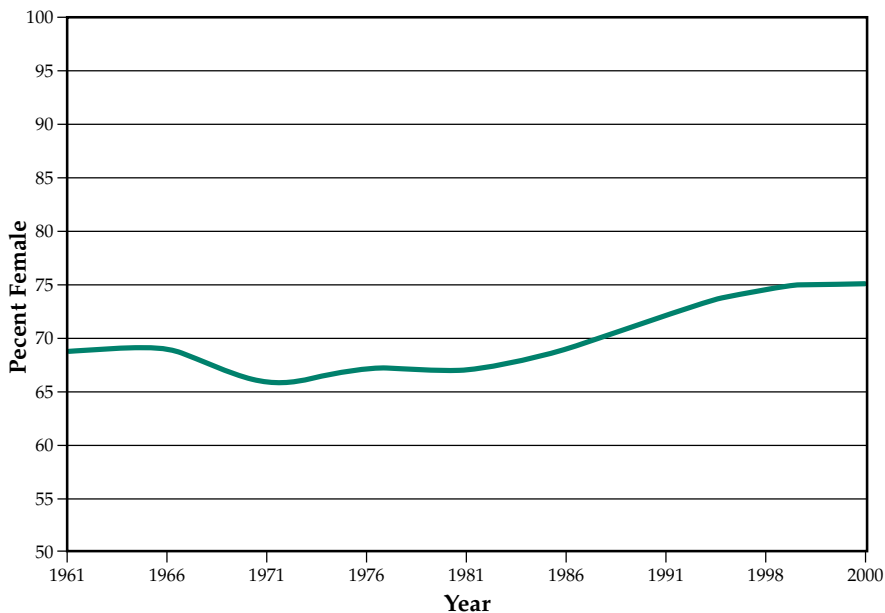
- ◆ The average age of teachers has increased over the past 50 years and many are now reaching retirement age. This trend and class size reduction programs have led to many new teachers entering schools. There is little evidence that experienced teachers are more effective than less experienced teachers, but teachers in their first few years tend to be both less effective and more variable in their ability to improve student learning.

Table 1 shows the age and experience distribution of teachers in 2000. Only 17 percent of teachers are under 30 years of age and only 11 percent have less than three years of experience. At the other end of the age spectrum, 29 percent of teachers are at least 50 years old and 35 percent have more than 20 years of experience. The median age of teachers was 41 years in 1961, dropping to 33 years by 1976 as a result of the increased hiring of teachers to serve the baby-boom generation. The median teacher age increased to 44 years in 1996.⁶ Accordingly, the proportion of teachers in their first year dropped from 9.1 percent in 1971 to just 2.1 percent in 1996.

Two forces are driving the increase in the average age of teachers. First, the teachers who were hired to educate the children of the baby boom generation are now reaching retirement age. Second, those entering



FIGURE 4
Percent of the Teacher Labor Force That is Female, 1961–2000



Source: Snyder, T. D. (2002). *Digest of Education Statistics, 2001* (NCES 2002-130). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (National Education Association, "Status of the American Public School Teacher, 1995–1996." 2000 data come from Snyder, T. D. (2003). *Digest of Education Statistics, 2002* (NCES 2003-060). Washington, DC: U.S. Department of Education. National Center for Education Statistics.

TABLE 1
Teachers' Age and Experience, 1999–2000

Age	%	Teaching Experience	%
less than 30 years old	16.9	less than 3 years	10.7
30 to 39 years old	22.0	3 to 9 years	28.4
40 to 49 years old	31.8	10 to 20 years	26
50 to 59 years old	26.2	greater than 20 years	34.9
at least 60 years old	3.1		

Source: NCES, Schools and Staffing Surveys, 1999–2000.

teaching today are older than in the past. For example, over 80 percent of new teachers in New York were under 25 years of age in 1970. By the mid-1980s this had decreased to roughly 40 percent, and it has continued

to decline slowly ever since.⁷ A recent report indicates that, nationally, approximately one quarter of first-year teachers are less than 25 years of age and about one seventh are 40 years of age or older (Table 2).

TABLE 2
Age of New Teachers, 1993–1994

Average Age	30.0 years
less than 25 years	25.0%
25 to 29 years	38.1%
30 to 39 years	22.8%
40 to 49 years	12.8%
50 or more years	1.3%

Source: Broughman, S. P., and Rollefson, M. R. (2000). *Teacher Supply in the United States: Sources of Newly Hired Teachers in Public and Private Schools* (NCES 2000-309). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Schools and Staffing Surveys, 1993–1994.)

Recent research provides strong evidence that teachers in their first year or two of teaching are not as effective at promoting student learning as are more experienced teachers.⁸ New teachers tend to be more variable in their effects on students and, on average, not as effective. After the first few years, however, there is no observed difference in student outcomes associated with teacher experience. We are not aware of research on the separate effects of teacher age on student outcomes.

TEACHER AND STUDENT RACE

- ◆ The racial/ethnic composition of the teacher workforce is quite different from that of the student population. The share of non-white teachers is much smaller than the share of non-white students. Some evidence suggests that same-race teachers can be more effective for improving student outcomes, though race is clearly not the only characteristic of teachers that is important.

In addition to being predominantly female, the teacher workforce is primarily white. Table 3 shows the distribution of teachers and students by race and ethnicity for the 1999–2000 academic year. The most striking conclusion from this table is that the racial and ethnic makeup of teachers does not reflect that of their students. In fact, the proportion of African-American and Hispanic students is nearly three times the percentage of African-American and Hispanic teachers.

The proportion of African-American and Hispanic students is nearly three times the percentage of African-American and Hispanic teachers.

WHAT WE KNOW AND WHY IT MATTERS



TABLE 3
Race and Ethnicity of Public Elementary and Secondary School Students and Teachers, in Percent, 1999–2000

Race/Ethnicity	Teachers	Students
Non-Hispanic White	84.4	62.1
Non-Hispanic African-American	7.6	17.2
Hispanic	5.6	15.6
Asian/Pacific Islander	1.6	4.0
American Indian/Alaska Native	0.9	1.2

Source: Teacher Data: NCES, Schools and Staffing Surveys, 2001. Student Data: Snyder, T. D. (2002). *Digest of Education Statistics, 2001* (NCES 2002-130). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Common Core of Data survey.)

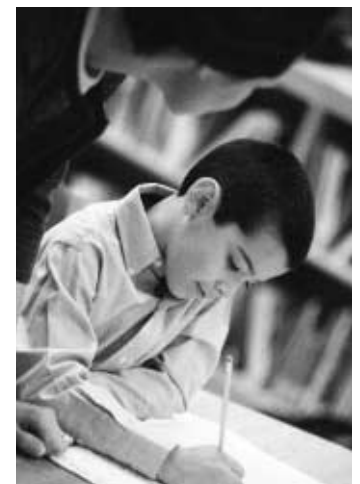
An important factor contributing to the under-representation of African-American and Hispanic college graduates in teaching is the general under-representation of African-Americans and Hispanics among college graduates. Among college graduates in 1976–77, for example, 90 percent were white, seven percent were African-American and two percent were Hispanic. By 1999–2000, the gap had decreased slightly to 78 percent, nine percent and six percent, respectively, yet non-Hispanic whites were still considerably over-represented in the group of college graduates.

The lack of minority teachers may have important consequences for minority student learning. Many studies have examined the relationship between teachers' race or ethnicity and student outcomes and have found no effects, but a recent study using experimental data concluded that having a teacher of the same race improves learning. The study estimates that such a match between a student and his or her teacher for one year improves reading and math achievement by three to four percentile points.⁹ If these results are valid, the lack of minority teachers in today's schools may be significantly harming minority students.

EDUCATIONAL ATTAINMENT

- ◆ Almost all teachers have bachelor's degrees and more than half of teachers have at least master's degrees as well. There is no evidence that having a master's degree improves a teacher's ability in the classroom.

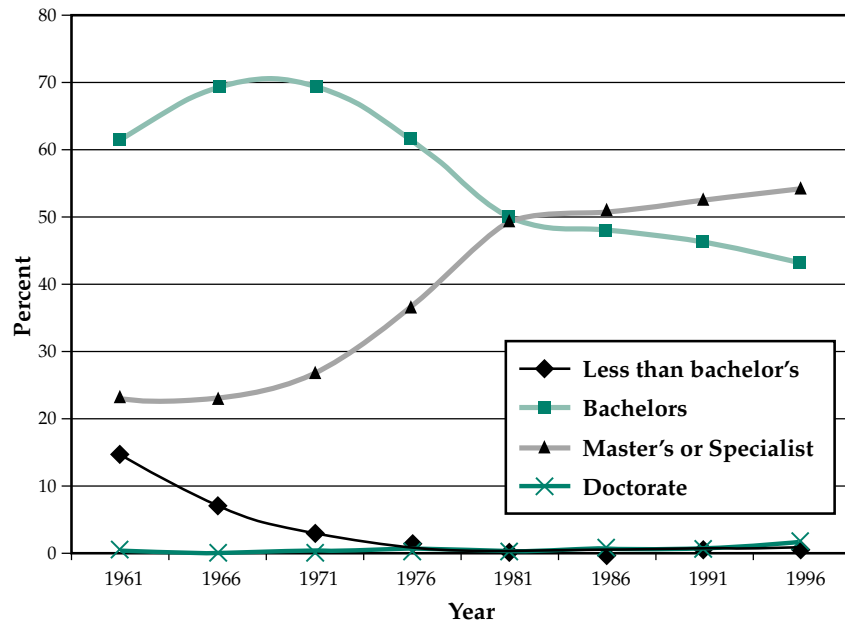
Today's teachers have spent a long time in professional preparation. In 1961, 15 percent of teachers had not completed an undergraduate



The lack of minority teachers may have important consequences for minority student learning.

degree. By the early 1980s, however, nearly all teachers had a bachelor's degree, and more than half held a master's degree or higher as well (Figure 5). Many teachers obtain master's degrees while teaching, as is shown by the differing education levels of new and experienced teachers. In 1997–98, for example, 16 percent of teachers with less than three years of experience had master's degrees, as compared to 31 percent of those with four to nine years of experience, 48 percent of those with ten to 19 years of experience, and 62 percent of those with more than 20 years of experience.¹⁰ It is likely that teachers obtain these degrees, at least in part, in response to state requirements and the additional pay linked to educational attainment in district or state salary schedules.

FIGURE 5
Highest Degree Earned by Public School Teachers, 1961–1996



Source: Snyder, T. D. (2002). *Digest of Education Statistics, 2001* (NCES 2002-130). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (National Education Association, "Status of the American Public School Teacher, 1995–1996.")

The educational attainment of teachers varies by the type of school in which the teacher holds a position. As shown in Table 4, 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 percent) followed by the Midwest. A much lower proportion of teachers in the South and West hold advanced degrees.

WHAT WE KNOW AND WHY IT MATTERS



TABLE 4
Percentage of Full-Time Public School Teachers Holding a Master's Degree, by School Level and Region, 1997–1998

	% MA
School Instructional Level	
Elementary	40
Middle	46
High	55
Region	
Northeast	60
Midwest	51
South	39
West	38

Source: Lewis, L., Parsad, B., Carey, N., Bartfai, N., Farris, E., and Smerdon, B. (1999). *Teacher Quality: A Report on the Preparation and Qualifications of Public School Teachers* (NCES 1999-080). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Fast Response Survey System, Teacher Survey on Professional Development and Training, 1998.)

Much controversy surrounds the evidence for whether specific degree attainment improves teacher effectiveness in the classroom. This is partly because of the inherent difficulty 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 may be a result of master's degrees failing to help teachers be more effective, or it might be attributable to schools hiring less-educated teachers because they have 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 effect these teachers have on their students. On average, however, teachers with master's degrees do not appear to be more effective at promoting student learning.¹¹



TEACHER ABILITY: TEST SCORES AND SELECTIVITY OF UNDERGRADUATE INSTITUTION

- ◆ There is substantial variation among teachers in their academic performance. There are many teachers who perform well on

Teachers with higher test scores are more effective at improving student achievement.

standardized tests, but on average teachers tend to score below the average for all college graduates. The average ability of teachers relative to their cohort has not changed dramatically over time, but the proportion of teachers from the very top of the test score distribution has dropped dramatically.

- ◆ There is evidence that teachers with higher test scores are more effective on average at improving student achievement, but test scores explain only a small part of what it takes to be a good teacher.

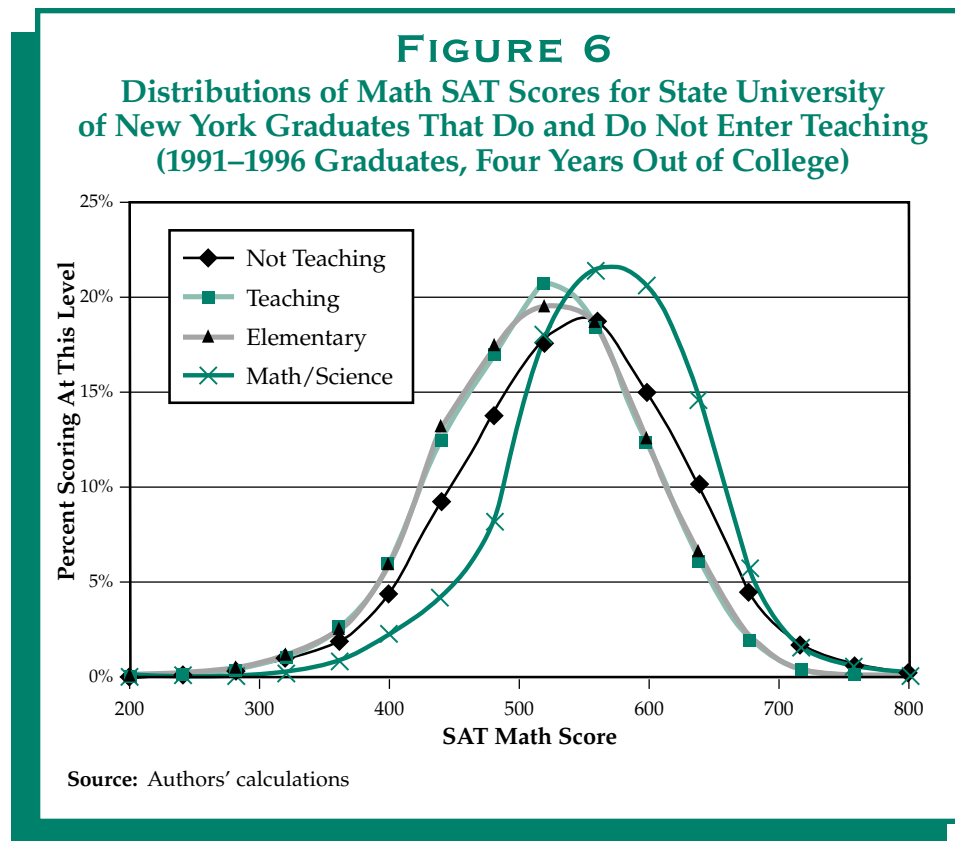
A number of studies have found that student achievement improves more in classes in which the teachers have higher test scores, especially verbal ability scores. Students also achieve more when taught by teachers who have attended more selective undergraduate institutions. To some degree, then, the selectivity of the institution serves as a proxy for higher ability.

On average, teachers tend to score below the typical college graduate on standardized aptitude tests.¹² Data on all graduates of the State University of New York (SUNY), for example, show that elementary and secondary school teachers are more likely to have scored at the lower end of the distribution of SAT scores than non-teachers, as can be seen in Figure 6, 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 their verbal SAT and a similar number scored at least 600 on their math SAT. High school math and science teachers score higher, on average, on the math SAT than do non-teachers; 43 percent of these teachers have scores greater than 600 on the math SAT, while only 32 percent of non-teachers score this high.

Nonetheless, the share of high scoring teachers in the workforce has decreased significantly over the last 40 years. Almost 25 percent of new female teachers in the 1960s scored in the top 10 percent of their high school graduating classes. By 1992 this number had dropped to 10 percent.¹³ The average female teacher in 1960 scored higher than 67 percent of other high school graduates. This figure dropped to 64 percent in 1992. This is only a slight decrease, but it is significant because it shows that, as job opportunities have opened up for female college graduates in occupations outside of teaching, the teacher workforce has lost some of its highest scoring teachers. This drop in teachers' qualifications as a result of improved opportunities for women college graduates appears to have adversely affected student outcomes.¹⁴

CONTENT KNOWLEDGE

- ◆ Almost all high school teachers have a major or a minor in the main subject area in which they teach. The greater content knowledge that may result from this specialization has been shown to positively affect high school teachers' ability to contribute to student learning.



Greater content knowledge in the area in which high school teachers teach (such as greater physics knowledge for those teaching physics) also appears to help teachers contribute to student learning.¹⁵ One way for teachers to obtain content knowledge is to earn a degree in the field in which they teach. More than a third 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.¹⁶

As expected, the types of majors teachers have vary substantially by teaching assignment. High school teachers are far more likely to have degrees in traditional academic fields (66 percent) than are elementary school teachers (22 percent) or middle school teachers (44 percent). Table 5 shows that in the last 20 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.¹⁷ Teachers with degrees in education are more likely to enter teaching directly after completing their degree. Using data on SUNY students, we find that in the first year after graduation 80 percent of those entering teaching had education degrees. Nine years after graduation, however, 36 percent of entering teachers had BAs in education while 17 percent had humanities BAs and 23 percent had behavioral or social science bachelor's degrees.

High school teachers are far more likely to have degrees in traditional academic fields (66%) than are elementary school teachers (22%) or middle school teachers (44%).

TABLE 5
Fields of Study for Bachelor's and Graduate Degrees, 1997–1998

	Academic Field	Subject Area Education ^a	General Education	Other Education ^b
All teachers ^c	38	18	37	7
School Instructional Level				
Elementary	22	9	58	11
Middle	44	22	27	7
High	66	29	5	1
Teaching Experience				
> 3 years	50	11	37	2
4–9 years	41	16	39	5
10–19 years	32	20	37	11
20+ years	36	20	36	8

^a Subject area education is the teaching of an academic field, such as mathematics education.

^b Examples of other education fields are special education, curriculum and instruction, and educational administration.

^c All teachers were targeted and include full-time public school teachers in grades 1 through 12 whose main teaching assignment was in English/language arts, social studies/social sciences, foreign languages, mathematics, science, or general elementary.

Source: Lewis, L., Parsad, B., Carey, N., Bartfai, N., Farris, E., and Smerdon, B. (1999). *Teacher Quality: A Report on the Preparation and Qualifications of Public School Teachers* (NCES 1999-080). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (1993–94 data: NCES, 1993–94 Schools and Staffing Survey, unpublished tabulations, 1998. 1998 data: NCES, Fast Response Survey System, Teacher Survey on Professional Development and Training, 1998.)



It is not enough for teachers to earn a degree in a specific academic field in order to utilize their content knowledge to aid their students. They also must be teaching in that area of expertise. Table 6 shows that most teachers do, in fact, have a graduate or an undergraduate major or minor in their main teaching field. The share 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 middle school grades (7th and 8th) than in the high school grades. Many teachers teach some classes outside of their main teaching assignment, and they 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

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in that field.¹⁸ The share of teachers with a major or minor in their teaching fields has been increasing, however; in 1993–94, 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.

TABLE 6
Percentage of Public School Teachers Who Reported an Undergraduate or Graduate Major or Minor in Their Main Teaching Assignment Field, 1997–1998

	9th–12th grade	7th –12th grade
English/Language Arts	96	86
Foreign Language	96	96
Social Studies/Social Science	96	89
Mathematics	90	82
Science	94	88

Source: Lewis, L., Parsad, B., Carey, N., Bartfai, N., Farris, E., and Smerdon, B. (1999). *Teacher Quality: A Report on the Preparation and Qualifications of Public School Teachers* (NCES 1999-080). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (1993–94 data: NCES, 1993–94 Schools and Staffing Survey, unpublished tabulations, 1998. 1998 data: NCES, Fast Response Survey System, Teacher Survey on Professional Development and Training, 1998.)

CERTIFICATION

- ◆ Almost all teachers hold a teaching certificate. Traditionally, teachers have obtained these by taking courses and student teaching during either their undergraduate education or as part of a master’s degree program.
- ◆ Many states and localities are experimenting with alternative certification programs, which either require less course work and student teaching or change the timing of these requirements so that teachers can fulfill them during their first year or two of teaching. There is great variation in the characteristics of both traditional and alternative certification programs. Current research does not provide convincing evidence as to which aspects of preparation are important for teachers in the classroom.

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

Almost all teachers are certified and those who are not are far more likely to teach in schools with low-performing students.

in their main teaching assignment.¹⁹ The evidence as to the effect of certification is mixed, perhaps because there is very little variation in whether teachers are certified. Almost all teachers are certified and those who are not are far more likely to teach in schools with low-performing students. This selection bias produces a strong positive correlation between test scores and the percent of certified teachers in a school, but makes it difficult to show causation.²⁰ The problem is compounded by the fact that most uncertified teachers have little teaching experience and the evidence is quite convincing that teachers in their first few years of teaching are both less able to help students learn and more inconsistent in their abilities than veteran teachers.²¹ Researchers currently know very little about the role teacher preparation programs play in developing effective teachers, or what features of teacher preparation are most important.

Many states have recently implemented alternative certification programs aimed at reducing the barriers to entry for college graduates interested in teaching (Table 7). All but six states have some kind of alternative-route program in place to recruit, train and certify teachers. Twenty-four states and the District of Columbia have “structured” alternative-route programs that include both pre-service training and mentoring components. Eighteen of the programs require entrants to pass a basic-skills or subject-area test. Alternative route programs in 12 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 a substantial investment of time prior to entering the

TABLE 7
State Alternative Route Programs

	Number of States (including D.C.)
States with alternative-route programs	45
States with “structured” alternative-route programs	25
Structured alternative routes that require a basic-skills or subject test	18
Structured alternative routes that require a subject-knowledge test	10
Structured alternative routes that require classroom training	13

Source: *Education Week*. (2003). “‘If I can’t learn from you...’ Ensuring a Highly Qualified Teacher for Every Classroom.” (Education Week Annual Survey 2002.)

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classroom.²² Alternative routes vary widely, some offering course work very similar to that provided by traditional routes, and some with very little course work or exposure to students and schools prior to entry into the classroom. There is virtually no information on what aspects of teacher preparation make a difference in student performance nor on the effects of these alternative programs on teaching and student outcomes.

INDUCTION AND PROFESSIONAL DEVELOPMENT

- ◆ Teachers receive additional training through induction programs and professional development programs. Many teachers cite induction programs as the most valuable aspect of their preparation. Some high-quality professional development programs have been shown to improve teacher effectiveness; however, we do not know whether investment in these programs is more beneficial than equal investment in other school resources, nor what aspects of these programs are particularly beneficial in a given context.

To supplement the alternative routes into teaching, more and more districts are implementing induction programs that help teachers in their first years of teaching. Table 8 shows that in 1997–98, 65 percent of new teachers had participated in induction programs in their first year of teaching, compared with only 14 percent of those with 20 or more years of experience. Again, these programs vary and there is little evidence on their effectiveness. The strongest evidence comes from the assessment of particular teacher professional development programs, where there is



TABLE 8
Percentage of Full-Time Public School Teachers
Who Participated in a Formal Induction Program
When They First Began Teaching
by Years of Experience for 1993–1994 and 1998

Teaching Experience	1993–1994	1997–98
> 3 years	59	65
4–9 years	47	55
10–19 years	17	28
20+ years	16	14

Source: Lewis, L., Parsad, B., Carey, N., Bartfai, N., Farris, E., and Smerdon, B. (1999). *Teacher Quality: A Report on the Preparation and Qualifications of Public School Teachers* (NCES 1999-080). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (1993–94 data: NCES, Schools and Staffing Survey, 1993–94, unpublished tabulations, 1998. 1998 data: NCES, Fast Response Survey System, “Teacher Survey on Professional Development and Training,” 1998.)

evidence that high quality programs can improve student outcomes, though some do not.²³ For example, a program in Jerusalem that increased training in elementary schools by 10–20 teacher hours per week resulted in positive gains for students, while a less costly program in Chicago schools failed to show positive effects on student learning.

DISCUSSION

Teachers and the paths they follow into teaching are far from homogeneous. What was once a field dominated by recent college graduates with degrees in education is now much more diverse, displaying a range of academic performance and preparation. We still do not know as much as we would like about the implications of this diversity for student outcomes.

There are some measured characteristics of teachers that researchers have linked to effective teaching. As noted above, a number of studies have found that student achievement improves more in classes in which the teachers have higher test scores or have attended more selective undergraduate institutions. Other studies have found that greater content knowledge for high school teachers or high-quality professional development also improve student outcomes. These measured characteristics still explain only a little of the variance in teachers' ability to improve student outcomes.

There are two possible reasons for our inability to determine what teacher characteristics make for good teaching. It is possible that teacher quality may be too intangible or too variable across contexts to ever measure accurately. On the other hand, most current studies are based on such coarse measures that it is not surprising that they do not accurately capture teacher quality. For example, many studies restrict their attention to years of experience and whether teachers hold a master's degree. There is little reason to suppose that these are strong predictors of teacher performance. Lack of appropriate data on teachers and students is, at least partially, responsible for the deficiency in our understanding of teachers. No national dataset contains good measures of teacher education or teacher knowledge that are linked to student outcomes.

Important teacher characteristics, such as the type of training they receive, may be *measurable* even though they are not *measured* in typical datasets. Recent efforts to compile state administrative information on the teacher workforce have produced some promising results. A few states have administrative data that link teachers to students, though most have only limited information on teachers, such as their years of teaching experience and whether they have a master's degree. Data from Texas, for example, can be used to link students to teachers but do not contain detailed information on the teachers. New York data, on the other hand, have more information on teachers but cannot be used to link teachers to students and their outcomes on a statewide basis. Nevertheless, administrative datasets from states and some large

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metropolitan areas are still the most promising source of information on teacher effectiveness. These data may, in the relatively near future, put us in a better position to ask what characteristics of individuals are important for successful classroom teaching in different environments.







IV

WHERE TEACHERS TEACH

Talented teachers are not distributed evenly across schools. In fact, there exists a systematic sorting of lesser-qualified teachers to high-poverty, low-performing schools. While many schools across the nation have highly qualified teachers, schools with high concentrations of poor, African-American, Hispanic, or low-performing students generally have teachers with lesser qualifications. The variable distribution of teacher characteristics is discernible at the state and city level, but it is especially dramatic when broken down by school type within large urban districts.

This section summarizes the information available on the distribution of teachers by selected school and student characteristics. It begins by looking at the distribution across large metropolitan areas and then focuses on the variability of teacher characteristics across individual schools based on minority composition, percent poverty and student test score performance. We do not have clear estimates of the effect of this sorting, given our lack of knowledge concerning the impact of teacher qualifications. Nevertheless, it is likely that this sorting has ramifications for the quality of education that students in different locations and with different characteristics actually experience in school.



THE DISTRIBUTION OF TEACHERS ACROSS SCHOOLS

- ◆ There is a systematic sorting of the least qualified teachers into schools with the highest minority enrollments, largest low income enrollments and the most academically disadvantaged students.
- ◆ Much of the sorting occurs within large urban districts. There is often not as much difference in the characteristics of teachers across regions as there is across schools within these districts.

The Distribution of Teachers Across Regions, Metropolitan Areas and Districts

Teacher characteristics are unevenly allocated across cities. Table 9 shows average teacher characteristics across 17 large metropolitan standard areas (MSAs), as well as variation in district average teacher qualifications within the metro areas, based on a national survey of schools from 1993–94. The measures include the selectivity of the undergraduate institution attended by the teachers, the average experience for all teachers in the district, the share of teachers who were newly hired, the percent of new hires with emergency certification, and the percent of teachers with five or fewer years of experience who plan to continue teaching in the district the following year.

TABLE 9
The Distribution of District Level Teacher Characteristics
within Metro Areas with At Least 20 Districts
in the Schools and Staffing Survey, 1993–1994

	College Quality		% Emergency Certified		Average Experience		% New Hires		% Plan to Teach Next Yr.	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Boston, MA	3.19	0.41	3.8	15.9	18.9	4.5	7.2	4.3	97	8
Chicago, IL	2.81	0.43	0.4	1.4	15.0	6.3	9.9	5.6	87	22
Dallas, TX	2.35	0.71	9.1	11	11.8	4.3	13.7	7.1	93	16
Detroit, MI	2.99	0.24	0.6	2.6	20.0	4.3	2.9	3.0	97	15
Hartford, CT	3.03	0.41	0.0	0	18.2	4.1	4.1	2.7	100	1
Houston, TX	2.47	0.58	10.0	9.5	12.6	4.5	14.9	7.2	88	16
Los Angeles, CA	3.25	0.69	28.1	20.3	16.5	6.3	9.0	3.5	92	16
Minneapolis, MN	3.00	0.51	1.9	5.6	15.9	4.6	10.0	3.4	97	8
Nassau-Suffolk	3.09	0.18	0.0	0	17.1	6.0	4.6	3.3	95	11
Oklahoma City	2.41	0.35	9.3	21.7	13.3	4.6	10.3	5.3	83	28
Philadelphia, PA	3.15	0.30	4.5	12.6	18.3	5.4	6.9	4.0	98	9
Phoenix, AZ	2.93	0.17	6.7	19.4	13.1	3.9	12.1	6.6	94	20
Pittsburgh, PA	2.87	0.33	0.6	2.5	18.3	6.1	8.0	6.1	96	12
Portland, OR	2.68	0.53	2.1	3.7	15.5	4.7	5.7	5.7	90	14
St. Louis, MO	2.74	0.25	5.6	21.0	15.5	5.4	8.3	3.9	99	2
Seattle, WA	3.28	0.28	0.3	0.9	15.0	3.7	9.5	3.8	96	7
Tulsa, OK	2.83	0.26	6.1	18.9	13.1	3.3	9.5	9.5	95	3
Across MSAs	2.89	0.39	5.2	9.8	15.8	4.8	8.6	5.0	94	13

Note: The standard deviations of the means are 0.28, 6.8, 2.45, 3.2 and 4.5 respectively.

Source: Loeb, S., and Page, M. (2001). *The Role of Compensating Differentials, Alternative Labor Market Opportunities and Endogenous Selection in Teacher Labor Markets* (Final Report): Spencer Foundation.

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The data reveal some significant differences across these large metropolitan areas. For example, there were substantially more emergency certified teachers in Los Angeles (28 percent) than in other large metropolitan areas. The average teaching experience was 20 years in Detroit compared to 13 years in Tulsa. And many fewer teachers planned to teach another year in Oklahoma City than in other cities.

There is some large variation in teacher characteristics between cities, but there is even greater variation in the average characteristics of teachers *within* individual cities. There are, for example, greater differences in the quality of teachers among the school districts of Phoenix than there are between the very different metropolitan areas of Phoenix and Detroit. This suggests that the distribution of teachers is driven by the forces in a local teacher labor market rather than by forces that may exist in a national market.

Table 10 reports national level statistics on basic demographic characteristics of teachers by residential area for 1999–2000. Approximately half of all teachers work in suburban settings, with the other half evenly distributed between rural and urban areas. When analyzed by location types, teachers are similar in terms of gender, experience, and certification, yet fairly different in terms of race, age, and educational attainment. Urban teachers are more often minorities and tend to be slightly older. Fewer rural teachers tend to hold master’s degrees.

Across Schools

Part of the difference in teacher qualifications across schools within a city corresponds to differences in student populations. Schools with minority enrollments over 80 percent have higher proportions of teachers in their first three years of teaching, higher proportions of teachers with less than 10 years experience, and the lowest proportion of teachers with more than 20 years experience. They also have the lowest share of teachers with certification in their primary or secondary teaching assignment.

Figure 7 shows that only one out of ten teachers are in their first three years of teaching in schools with low minority enrollment. In comparison, more than one of five teachers in schools with high minority enrollment are in their first years. Results are very similar in schools with large numbers of low income students, defined by the percentage of students eligible for free and reduced price lunch. In high schools with few low-income students 91 percent of teachers 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.²⁴

The numbers in Figure 7 are national. Disparities in the distribution of teacher characteristics within some large urban school districts are even greater. In New York City, for example, 21 percent of non-white students have teachers who are not certified in any subject taught, compared to only 15 percent of white students. Twenty-six percent of non-white students have teachers who failed the general knowledge certification

The distribution of teachers is driven by the forces in a local teacher labor market rather than...in a national market.

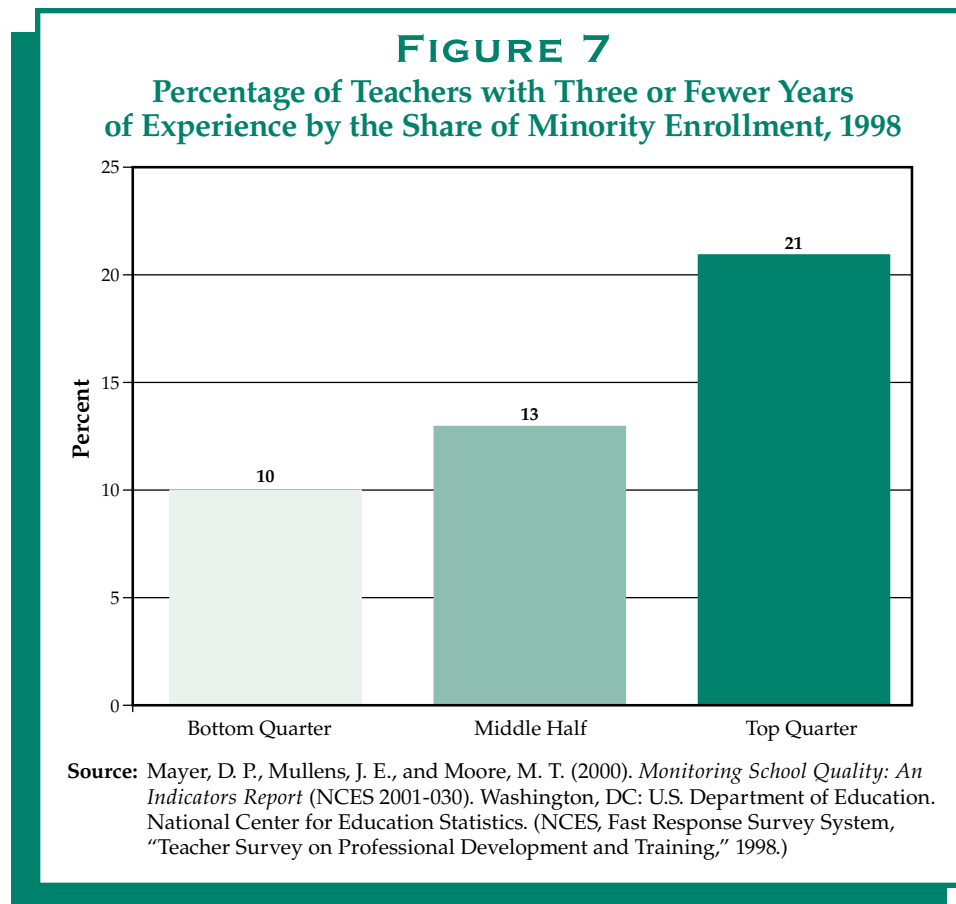


TABLE 10
Characteristics of Public School Teachers
by Location of School 1999–2000

	Urban Areas	Suburbs	Rural Areas
# of teachers	803,013	1,503,555	678,214
% of teachers	26.9	50.4	22.7
% female	75.5	75.4	73.1
% White	71.2	88.2	91.4
% African American	14.9	5	4.5
% Hispanic	10.2	4.6	2.3
% Asian/Pacific Islander	2.8	1.5	0.5
% Native American/Alaskan	0.9	0.7	1.3
% < 30 years old	15.6	18.3	15.3
% 30–39 years old	20.7	21.9	23.6
% 40–49 years old	32.3	30.5	34.1
% 50–59 years old	27.5	26.5	24.2
% 60+ years old	3.9	2.8	2.7
less than 3 years experience	11.6	10.7	9.7
3 to 9 years teaching experience	26.9	29.9	26.7
10 to 20 years experience	26.2	25.6	26.6
20 or more years experience	35.2	33.9	37
% certified in main field	93.6	94.7	94.6
% certified in second field	53.5	56.1	57.6
% with bachelor's only	53	52	61
% with master's	46	47	39
% with doctorate	1	1	0

Source: NCES, Schools and Staffing Surveys 1999–2000 except for education which comes from Parsad, B., Lewis, L., and Farris, E. (2001). *Teacher Preparation and Professional Development: 2000* (NCES 2001-088). Washington, DC: U.S. Department of Education. National Center for Education Statistics.





exam, compared to 16 percent of white students. Similarly, poor students have less-qualified teachers than non-poor students. In the New York City school district, 22 percent of poor students have teachers who are not certified in any subject taught, compared to 17 percent of non-poor students. Thirty percent of poor students have teachers who failed the certification exam, compared to 21 percent of non-poor students.²⁵

Students in high minority and high poverty schools have less-qualified teachers. The same is true in poorly performing schools. Table 11 shows that in New York schools where more than 20 percent of the students performed at the lowest level on the 4th grade English Language Arts exam, a third of the teachers had failed the general knowledge portion of the certification exam at least once. This is about four times higher than the failure rate among teachers in schools where none of the students scored at the lowest level. Statistics on other teacher attributes are equally disturbing. The lowest performing schools have higher proportions of teachers with no experience, teachers not certified in their assignment areas and teachers from the least competitive colleges. Low performing schools attract fewer teachers from the most competitive colleges.

Discussion

These national and state level statistics illustrate the systematic distribution of the least qualified teachers into schools with the highest

TABLE 11
Average School Attributes of Teachers by Student Test Score

Teacher Quality Attributes	Percent of Students at Level 1 on 4th Grade English Language Arts			
	0	0% to <5%	5% to <20%	>20%
% with No Teaching Experience	6	7	9	14
% Not Certified in Any Assignment	3	4	9	22
% Fail NTE Gen. Know. or NYS Lib. Arts Exam	9	10	19	35
% BA from Most Competitive College	11	11	9	8
% BA from Least Competitive College	10	11	16	26

Note: Level 1 includes the students who scored in the lowest level of the test.

Source: Lankford, Loeb and Wyckoff, 2002. (New York State, 4th grade English Language Arts test).

minority enrollments, largest low-income enrollments, and most academically disadvantaged students. The distribution of teachers is the result of a number of forces. These include the institutional structure of the school systems, the role of teachers’ unions, and administrators’ tastes and abilities. Much also comes down to the dynamics of teacher labor markets, and to the consequences of individual teachers expressing their preferences in their career choices. Understanding the factors that led to the current distribution of teachers is important in order to explore policies that could increase the number of highly qualified teachers in schools with disproportionate numbers of non-white, poor and low-performing students.



TRANSFER AND QUIT BEHAVIOR AND ITS ROLE IN TEACHER SORTING

- ◆ Differences in the characteristics of teachers across schools are largely due to the initial match of teachers to schools in their first teaching jobs, but the decisions of teachers to either transfer to another school or quit teaching altogether contribute to this sorting as well.

The teaching workforce is generally quite stable: most teachers stay in the school they are teaching in from year to year. Between the 1993–94 and 1994–95 academic years, for example, 86 percent of teachers stayed in the same school, seven percent transferred between schools and another seven percent left teaching (Table 12). These numbers were fairly consistent between genders, educational attainment levels, grade levels



TABLE 12

Percentage of Public School Stayers, Movers and Leavers, by Gender, Age and Race/Ethnicity: 1993–1994 to 1994–1995

	Stayers	Movers	Leavers
Number	2,205,268	182,949	167,564
Percent	86.3	7.2	6.6
Gender			
Male	88.2	6.6	5.2
Female	85.6	7.4	7.1
Race/Ethnicity			
White, non-Hispanic	86.7	6.8	6.5
African American, non-Hispanic	84.9	8.5	6.6
Hispanic	79.4	11.5	9.1
Degree Earned			
Bachelor's	86.2	7.5	6.3
Master's	86.8	6.7	6.5
Education specialist	81.8	7.3	10.9
Full-time Teaching Experience			
Less than 1 year	79.7	11.1	9.3
1 to 3 years	79.6	12.7	7.8
4 to 9 years	83	9.9	7.1
10 to 19 years	89.1	6.6	4.4
20 to 24 years	92.5	2.8	4.6
25 years or more	84.9	4.1	11.1
Level Taught			
Elementary	86.0	7.6	6.4
Secondary	86.6	6.7	6.7

Source: Whitener, S. D., and Gruber, K. J. (1997). *Characteristics of Stayers, Movers, and Leavers: Results from the Teacher Followup Survey: 1994–95* (NCES 97-450). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Schools and Staffing Survey, Teacher Followup Survey, 1994–95.)

taught, and between African-American teachers and white teachers. Hispanic teachers were somewhat more likely to leave.

In the 1993–94 data in Table 12, there appears to be little difference in the exit behavior of elementary and secondary teachers, yet other sources suggest that elementary teachers are less likely than secondary school teachers to switch schools or districts, or to exit teaching altogether.²⁶ Among secondary teachers, those who teach in the sciences, especially in physics, are more likely to leave the profession than teachers in other subject areas. Math teachers are no more likely to leave than teachers in the humanities.²⁷

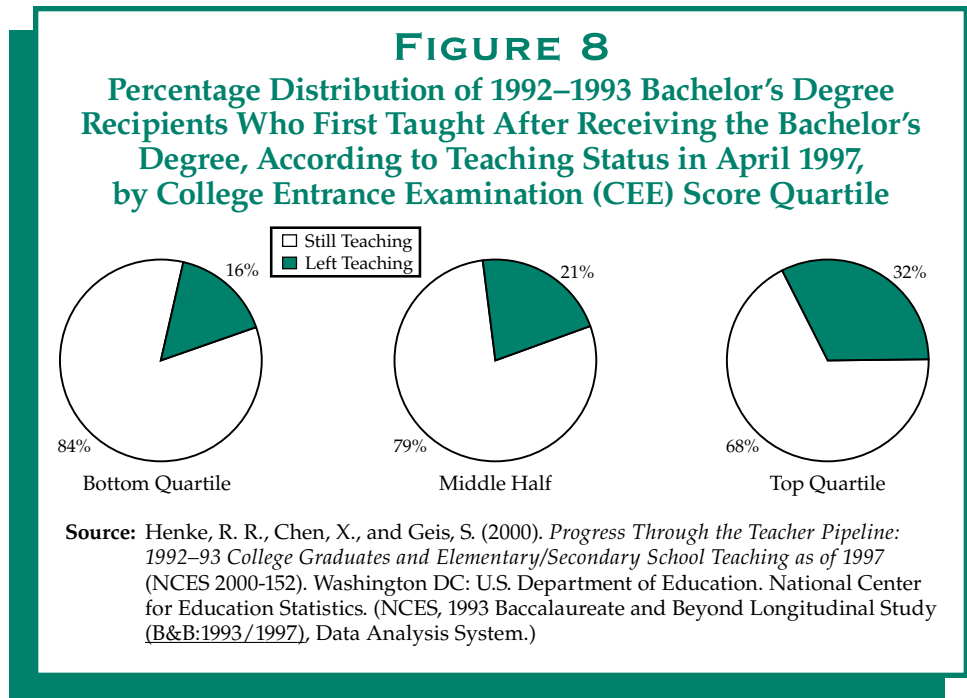
Data on recent college graduates show that young workers tend to switch jobs, regardless of their occupation.

New teachers are more likely to leave than more experienced teachers. This might be because teaching is more difficult than many new teachers expect, which causes them to leave soon after starting their teaching careers. In addition, data on recent college graduates show that young workers tend to switch jobs, regardless of their occupation. Four years out of college, teachers were no more likely to have switched occupations than were other white-collar workers including engineers, scientists, those in the legal occupations, or those in business support or financial services. Approximately one quarter of workers in these occupations had switched occupations within four years of leaving college.²⁸ Clearly, young people are transient in their first job or jobs out of college, regardless of whether they enter the teaching profession or another.

There are, nevertheless, important differences between teachers who stay in teaching and those who move to other professions. For example, teachers with higher test scores are more likely to transfer or quit teaching, leaving behind their lower scoring colleagues. Figure 8 looks separately at teachers who scored in the bottom quarter on their college entrance exam, those who scored in the middle half, and those who scored in the top quarter. These teachers graduated from college in 1993. By April of 1997, almost four years after receiving their bachelors' degrees, only 16 percent of the lowest scoring teachers had left teaching, compared with 21 percent of middle scoring teachers and 32 percent of the highest scoring teachers.

Not only are high scoring college graduates less likely to enter teaching, they are more likely to leave once they do enter. Either these high-ability teachers enter with the intention of staying for a shorter period of time, or the work turns out not to provide as much satisfaction as do alternative occupations available to them.

Higher-ability teachers are more likely to leave the profession in some geographic areas than in others. In New York City, for example, there are larger differences among teachers who are transferring or quitting. Those transferring to another district have failed the certification exams half as often as those remaining in the same school. They are twice as likely to have attended a highly competitive college, and about half as likely to have attended a less competitive college. New York City teachers who



leave teaching in New York State are also substantially more qualified than those who remain.

Teacher mobility also varies by school type. There are lower turnover rates in the Northeast region of the country than in other regions, and larger schools face less turnover than do smaller schools. There are higher turnover rates in schools with higher proportions of African-American and Hispanic students. Urban schools appear to have a slightly higher turnover rate than suburban schools, but these averages mask large differences in some urban areas.²⁹ For example, in New York City approximately 62 percent of teachers leave their school within five years, compared to 54 percent in the suburbs. Thirty-five percent of New York City teachers leave teaching within five years, compared with 25 percent of teachers in the suburbs. Across the other large New York State metropolitan areas, 29 percent of urban teachers leave teaching, compared with 22 percent of suburban teachers.³⁰

The Contribution of Quits and Transfers to the Sorting of Teachers Across Schools

Teacher exit decisions clearly differ across school types. The chaos created by these quits and the additional costs needed to recruit and hire new teachers disadvantage the schools most affected by teacher exits. This trend is especially costly because the schools that lose the most teachers tend to be the poorest to begin with. In addition, this quit behavior contributes to the differences in the qualifications of teachers across schools, as highly skilled teachers disproportionately leave the lowest-performing schools.

There are higher turnover rates in schools with higher proportions of African-American and Hispanic students.





It is important to note, however, that the differences in the qualifications of teachers across schools are not entirely due to differential quit rates. They also depend on differences in the characteristics of teachers who are initially hired by different schools, as we discuss below. To the extent that suburban areas employ teachers with higher test scores and more prestigious educational backgrounds, most of the difference is evident when teachers choose their first teaching job. Within urban districts, quits and transfers exacerbate this initial match, as higher scoring teachers move from lower to higher performing schools. Even within districts, however, quits and transfers appear to explain less than half of the differences in the qualifications of teachers across schools.³¹

What Do Teachers Do When They Leave Teaching?

What are the other opportunities that help to entice teachers away from the teaching field? Table 13 gives the 1994–95 occupation of individuals who had been teachers in 1993–94. Over a quarter of public school teachers leave teaching for retirement. This share has increased in recent years as teachers hired to teach the baby boom generation retire. Only one-fifth of those who leave teaching work in occupations outside of education. Another fifth remain in schools but work in other education related occupations. About 16 percent leave to take care of children or homes. This percentage is much higher for younger teachers, many of whom leave to raise families.³²

TABLE 13
Current Primary Occupational Status of Teachers
Who Left the Teaching Profession: 1994–1995

	Public	Private
Retired	27.1	10.8
Homemaking and/or child rearing	16.2	17.1
Working in an elementary or secondary school with an assignment other than teaching	21.2	11.9
Working in an occupation outside of elementary or secondary education	20.4	34.1
Other	11.3	15.7
Attending college or university	2.2	8.6

Source: Whitener, S. D., and Gruber, K. J. (1997). *Characteristics of Stayers, Movers, and Leavers: Results from the Teacher Followup Survey: 1994–95* (NCES 97-450). Washington, DC: U.S. Department of Education, National Center for Education Statistics. (NCES, Schools and Staffing Survey, Teacher Followup Survey 1994–95.)

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Table 14 shows that more than two-thirds of those who move to other occupations enter the private or non-profit sector, 21 percent work for the government, and 8 percent become self-employed. Private school teachers who leave teaching are more likely, on average, to work outside of education and are more likely to pursue higher education.

Table 15 shows that there is some movement between private schools and public schools. Of public school teachers who changed schools, less than one in 20 moved to a private school. Of private school teachers who switched schools, however, almost half switched to the public sector.

TABLE 14
Current Primary Occupational Status of Teachers Who Left the Teaching Profession and Are Working in an Occupation Outside of Elementary or Secondary Education: 1988–1989, 1991–1992, 1994–1995

	Public	Private
Employee of a private company, business, or individual for wages, salary, or commission	70.3	76.2
Federal/State/Local government employee	21.2	9.1
Self-employed in own business, professional practice, or farm	8.4	13.8

Source: Whitener, S. D., and Gruber, K. J. (1997). *Characteristics of Stayers, Movers, and Leavers: Results from the Teacher Followup Survey: 1994–95* (NCES 97-450). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Schools and Staffing Survey, Teacher Followup Survey 1994–95.)

TABLE 15
Percent of Teachers Switching Schools Who Switched Sectors, 1994–1995

	Public in 1993–94	Private in 1993–94
Sector in 1994–95		
Public	95.7	52.4
Private	4.3	47.6

Source: Whitener, S. D., and Gruber, K. J. (1997). *Characteristics of Stayers, Movers, and Leavers: Results from the Teacher Followup Survey: 1994–95* (NCES 97-450). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Schools and Staffing Survey, Teacher Followup Survey 1994–95.)





V

WHY TEACHERS TEACH WHERE THEY DO

The behavior of individual teachers may break with all of the trends highlighted above. Some high-ability teachers choose to teach in low-performing schools, some low-ability teachers choose to leave the profession, and most new teachers remain to become part of the skilled and experienced teacher labor force. At the individual level, multiple unmeasured forces influence the choices of teachers. At the aggregate level, however, the data show that potential teachers are more likely to choose teaching and less likely to leave if teaching conditions are favorable. They are also likely to prefer some types of districts to others, and they are likely to prefer one school to another within the same district if working conditions are more appealing. This chapter describes the attributes of teaching jobs that appear to be important to teachers. In particular, it looks at three powerful predictors of teacher sorting across districts and schools: wages, non-wage job characteristics, and distance of the school from home. The chapter concludes with a discussion of how district hiring practices can influence teacher sorting.



WAGES

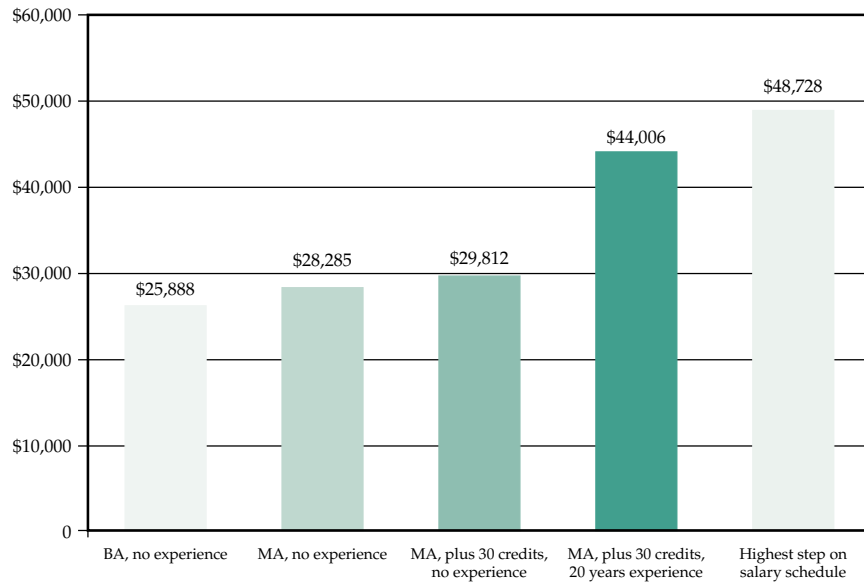
- ◆ In choosing where to teach, teachers appear to care about wages. Within a district, wages tend to vary only by the experience and education level of the teacher. Across districts wages can vary substantially, but much of this variation is across regions in the country and can be explained largely by the wages available in other occupations in the region. Within regions, there is much less wage variation, though differences between particular districts can be large.

A large literature suggests that teachers respond to wages and are more likely to choose to teach when starting teacher wages are high relative to wages in other occupations.³³ In fact, teachers appear to be at least as responsive to wages in their decisions to quit teaching as are workers in other occupations.³⁴ In 1999–2000 the average beginning teacher without a master’s degree earned just under \$26,000. Figure 9 shows that average salaries increase with additional education and years of experience. The top teacher salaries averaged about \$49,000 per year in 1999–2000.

Figure 10 shows the change in average teacher salaries over time. 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 aged population dropped. In the 1980s, salaries rose again and remained relatively stable through the 1990s.

Teachers appear to be at least as responsive to wages in their decisions to quit teaching as are workers in other occupations.

FIGURE 9
Average Teacher Salary Schedules for Various Levels of Earned Degrees and Experience for Public School Districts with a Salary Schedule, 1999–2000



Source: Gruber, K. J., Wiley, S. D., Broughman, S. P., Strizek, G. A., and Burian-Fitzgerald, M. (2002). *Schools and Staffing Survey, 1999–2000: Overview of the Data for Public, Private, Public Charter, and Bureau of Indian Affairs Elementary and Secondary Schools* (NCES 2002-313). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Schools and Staffing Survey, School District Survey, 1999–2000.)

Salaries of teachers have fallen behind salaries in non-teaching jobs for women college graduates since the 1970s.

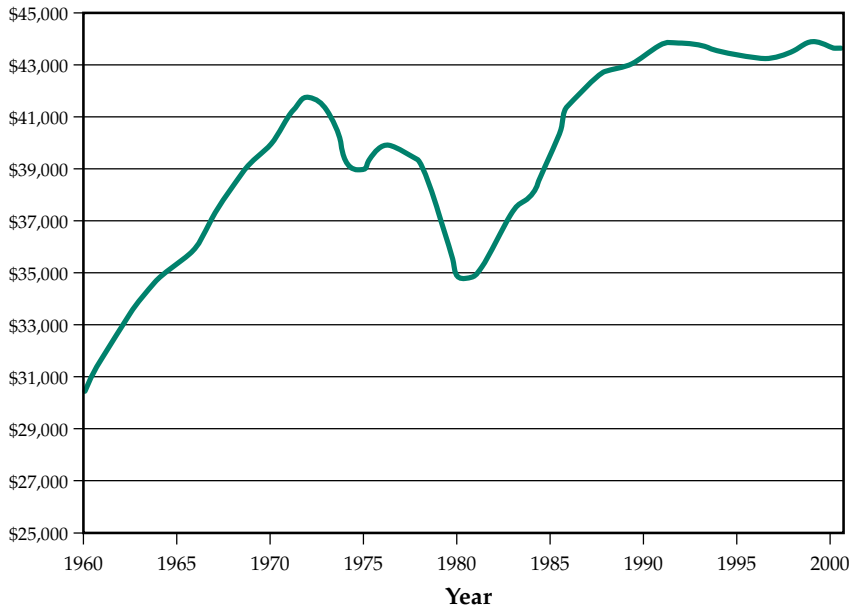
Teacher wages have increased dramatically in real terms over the past 40 years, as Figure 11 shows. When considering whether to become a teacher, however, individuals look not only at the salaries they can expect as a teacher, but also at the salaries available in other possible occupations. Increases in teacher salaries in the 1960s and 1980s corresponded to similar increases in wages for non-teaching college graduates. As Figure 11 shows, however, the salaries of teachers have fallen behind salaries in non-teaching jobs for women college graduates since the 1970s. As these diagrams indicate, the real wages of teachers grew substantially during the period, but the opportunity cost of becoming a teacher (in terms of foregone wages) increased at least as fast.

As Figure 12 shows, the wages of teachers are low relative to the wages of full-time working 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. Teaching is simply not a lucrative option for a college graduate with career opportunities in other occupations.

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FIGURE 10

Estimated Average Annual Salary of Teachers in Public Elementary and Secondary Schools: 1959–1960 to 2000–2001 (2002 Dollars)

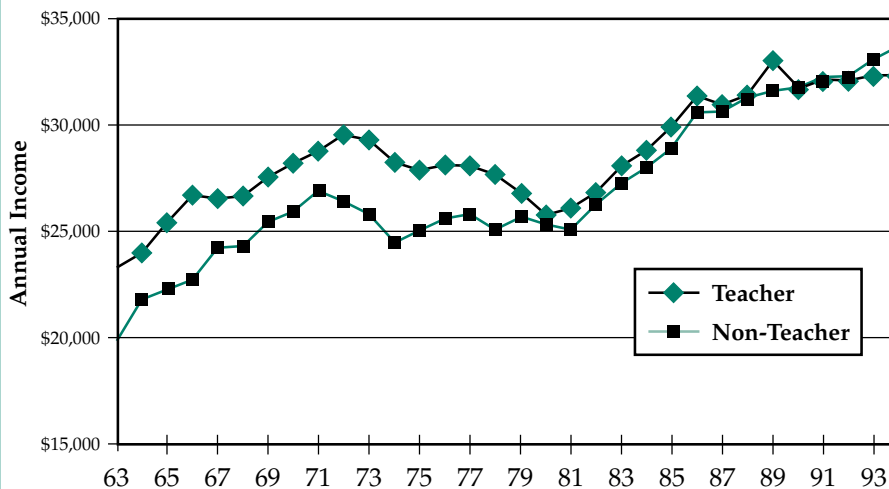


Source: Snyder, T. D. (2002). *Digest of Education Statistics, 2001* (NCES 2002-130). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (National Education Association, Estimates of School Statistics, various years; and unpublished data.)



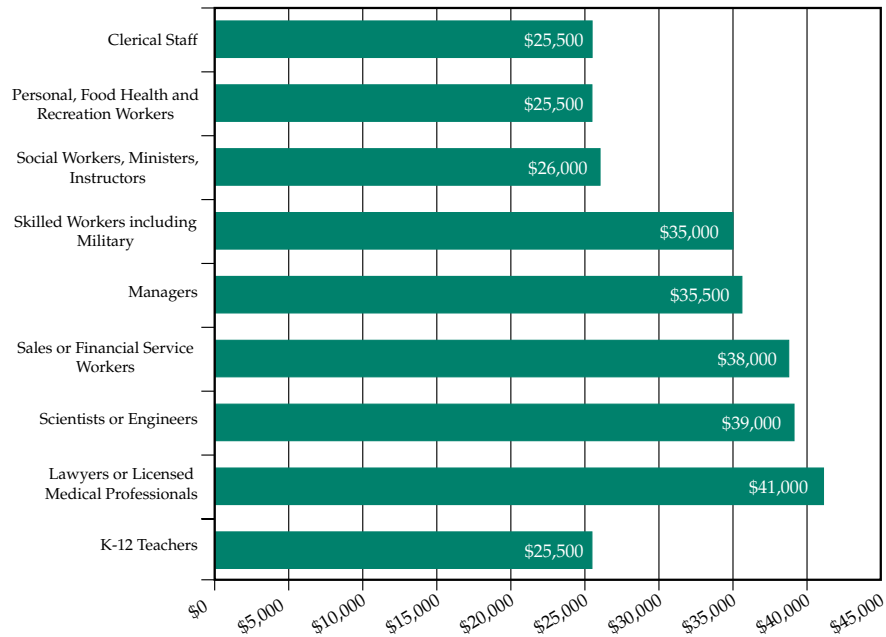
FIGURE 11

Mean Annual Wage and Salary Income for Women College Graduates (1994 Dollars)



Source: Loeb, S., and Page, M. (2000). 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(3). (March Current Population Surveys 1964–1995.)

FIGURE 12
Average Annual Salary of 1992–1993 Bachelor’s Degree Recipients Employed Full-Time in April 1997, by Occupation



Source: Henke, R. R., Chen, X., and Geis, S. (2000). *Progress Through the Teacher Pipeline: 1992–93 College Graduates and Elementary/Secondary School Teaching as of 1997* (NCES 2000-152). Washington DC: U.S. Department of Education. National Center for Education Statistics. (NCES, 1993 Baccalaureate and Beyond Longitudinal Study (B&B: 1993/1997, Data Analysis System.)



Salaries affect not only whether an individual chooses to become a teacher, but in which district he or she chooses to teach. There is significant variation in wages across metropolitan areas in the United States, but not as much variation across districts in the same metropolitan areas. Table 16 summarizes the starting wages of teachers across districts within each metropolitan area for which at least 20 districts were represented in a 1993–94 national survey of schools. There are substantial differences in average wages across cities. Hartford, Nassau-Suffolk and Philadelphia all had average wages of approximately \$30,000 for starting teachers with a bachelor’s degree in 1993–94. In contrast, Dallas, Oklahoma City, and Seattle offered approximately \$21,000 to their starting teachers. The standard deviation in mean starting wages across metro areas was slightly more than \$3,000, while the average standard deviation across districts within metro areas was less than \$2,000.

Wages for teachers with a master’s degree and 20 years of experience are higher, but they display similar patterns. The average salary across districts ranged from \$29,805 in Tulsa to \$63,848 in Nassau. As salaries increase, variation across cities tends to grow as well. The standard

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TABLE 16

The Distribution of Starting Wages within Metro Areas with At Least 20 Districts in the 1993–1994 Schools and Staffing Survey

	n	Mean	Std. Dev.	Lowest	Highest	10th Perc.	90th Perc.
Boston, MA	53	23559	1870	18715	27357	21039	25760
Chicago, IL	40	24851	3135	19891	31621	21149	29325
Dallas–Fort Worth, TX	21	20763	2795	17000	24590	17000	24163
Detroit, MI	49	26977	2252	22703	32688	24007	29720
Hartford, CT	21	29075	1657	26219	32766	27001	31003
Houston, TX	21	22888	1866	19000	25159	19500	24600
Los Angeles, CA	28	26152	1960	21980	30004	23379	28612
Minneapolis–St. Paul, MN	23	23106	1466	20206	26676	21025	24478
Nassau-Suffolk, NY	28	30911	2150	26911	35261	28235	34145
Oklahoma City, OK	22	21761	1410	18180	23419	19825	23066
Philadelphia, PA/NJ	37	29322	1881	24884	32900	27656	32100
Phoenix, AZ	26	22920	884	21000	25007	21550	24020
Pittsburgh, PA	20	26664	4457	18500	34554	19554	32063
Portland-Vancouver OR/WA	22	22097	1110	20258	24816	20521	23186
St. Louis, MO/IL	23	22987	2151	19000	25800	19450	25500
Seattle, WA	20	21640	547	21425	22585	21425	23393
Tulsa, OK	35	21895	984	19724	23300	20200	22950
Across these MSAs	17	24563	1916				

Note: The standard deviation of the mean is 3075.

Source: Loeb, S., and Page, M. (2001). *The Role of Compensating Differentials, Alternative Labor Market Opportunities and Endogenous Selection in Teacher Labor Markets* (Final Report): Spencer Foundation.

More than half of the variation in teacher wages across metropolitan areas can be explained solely by differences in the wages of non-teachers.

deviation for this higher wage level is \$9,200 across regions, which is almost twice as large as the average standard deviation within metro areas of \$4,761.

A number of factors explain the variation in teacher salaries across regions. For example, one region could have greater demand for teachers because of policy preferences for smaller class sizes or more skilled teachers. Alternatively, salaries could be higher because the region does not produce many teachers and thus has to pay more to attract enough college graduates into teaching. The wages available to potential teachers in non-teaching jobs are also likely to play an important role. When wages in alternative occupations are higher, schools need to pay teachers more to attract and retain them. It appears that more than half of the variation in teacher wages across metropolitan areas can be explained solely by differences in the wages of non-teachers.³⁵ This finding and the difference between the real wage and the opportunity cost depicted in Figure 11 show that variation in teacher wages may not reflect differences in the wage benefits of teaching if these are not considered in the context of alternative opportunities.

Variation across metropolitan areas is greater than variation within metropolitan areas, but the differences between districts within the same MSA can also be substantial. In Pittsburgh, for example, the lowest starting salary in 1993–94 was \$18,500 while the highest was \$34,554. Chicago also showed substantial differences with starting salaries ranging from \$19,891 to \$31,621. Other metropolitan areas had smaller variation. In Seattle there was only a \$1,160 difference in the starting wages between the lowest and the highest paying district.

The salaries for more experienced teachers shown in Table 16 display even greater variation within regions. In Chicago, the difference in salary between the lowest and highest paying district for teachers with 20 years of experience and a Master’s degree was more than \$36,000. Only the districts in Dallas, Houston and Tulsa showed ranges of less than \$10,000 for the same education and experience. Even these smaller differences across districts were large enough to be economically important.

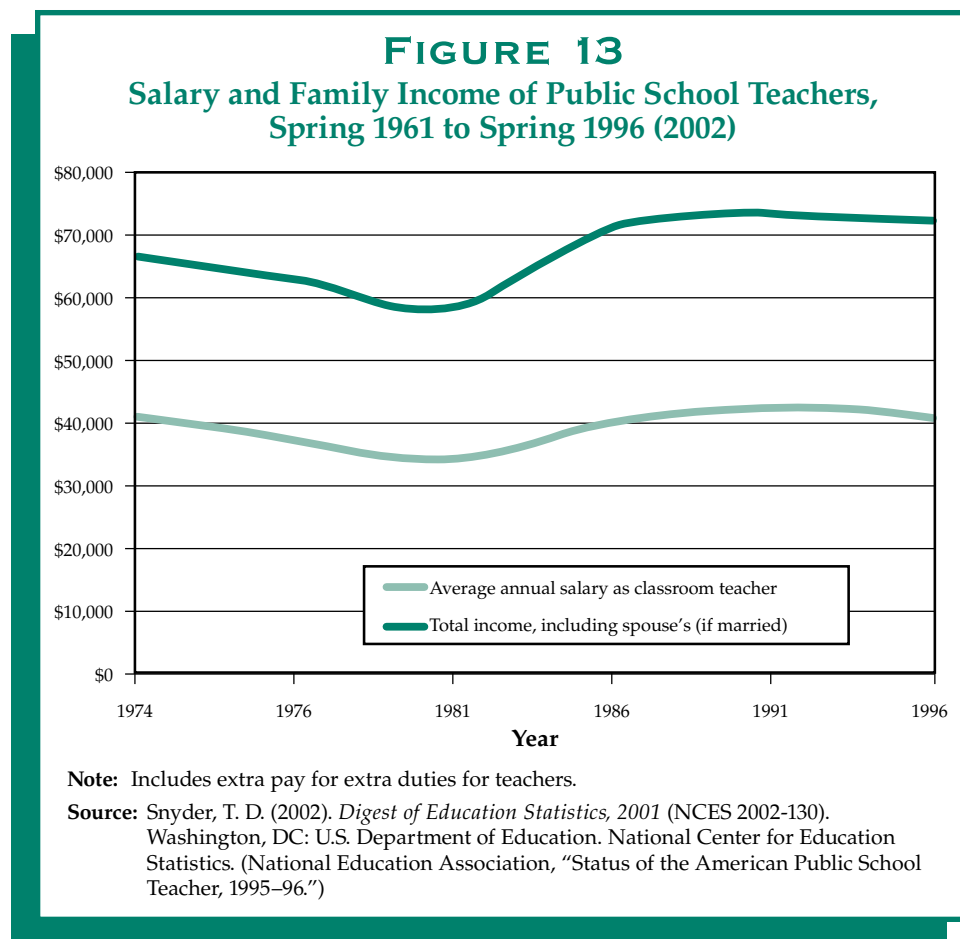
Do districts with particular characteristics systematically pay lower or higher salaries than other districts? The 1993–94 Schools and Staffing Surveys showed that districts with higher proportions of free lunch-eligible students paid lower salaries, although the effect was small. A 30 percent difference in the poverty rate was associated with an approximately \$260 difference in starting salaries and a \$600 difference in salaries for more experienced teachers, once other factors were adjusted for. Although there appears to be no evident difference in wages based on the share of Hispanic students in a given district, wages for experienced teachers in districts with 30 percent more African-American students average \$1,500 less, controlling for other factors.³⁶ Larger districts tend 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



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urban or suburban counterparts. There is also some evidence that districts in the suburbs of large cities tend to pay higher wages than their more urban or rural counterparts, though this is certainly not true in all metropolitan areas.³⁷

Many teachers are married. Figure 13 shows the difference between teachers' personal income and their total family incomes. It is clear that the family income of married teachers is much greater than the teacher salary alone. This suggests that when making career decisions many teachers are likely to consider the effect of their decisions on the job opportunities of spouses or other household members.

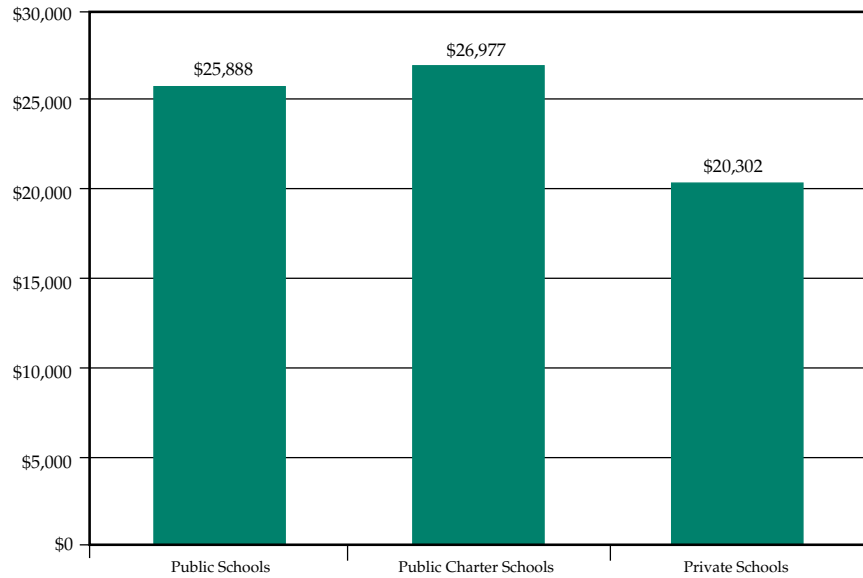


Finally, there are distinct salary differences between public and private schools. Figures 14a and 14b show that the starting salaries of private school teachers are approximately \$5,500 less than those of public school teachers. Likewise, the highest step on the salary schedule for private school teachers is approximately \$14,400 less than it is for public school teachers. Salaries in charter schools are more similar to their public school counterparts than they are to private schools.

In summary, substantial evidence supports the claim that teachers respond to wages. An increase in wages increases the supply of



FIGURE 14A
The Average Starting Salary for Teachers with a Bachelor's Degree and No Experience, 1999–2000



Source: Gruber, K. J., Wiley, S. D., Broughman, S. P., Strizek, G. A., and Burian-Fitzgerald, M. (2002). *Schools and Staffing Survey, 1999–2000: Overview of the Data for Public, Private, Public Charter, and Bureau of Indian Affairs Elementary and Secondary Schools* (NCES 2002-313). Washington, DC: U.S. Department of Education. National Center for Education Statistics. (NCES, Schools and Staffing Survey, 1999–2000.)

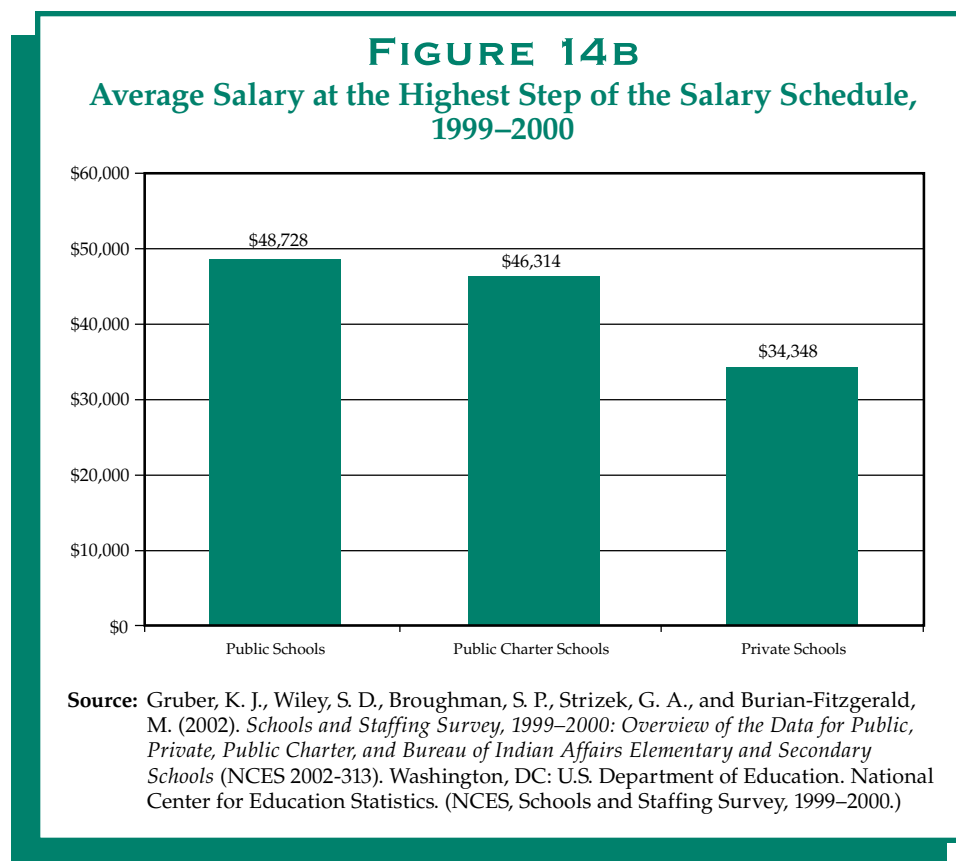
candidates for teaching positions. Similarly, a downturn in the job stability or in the wages of other occupations improves the supply of teachers. Evidence from the 1980s shows that increases in teacher wages were not accompanied by corresponding increases in the supply of teachers,³⁸ but this was largely because the wages for non-teaching women college graduates outpaced teacher wage gains during this period. An increase in teacher wages that exceeds increases in other fields is likely to improve the supply of teachers.

Salaries are only one criterion among many that affect individuals' decisions about whether and where to teach.

NON-WAGE JOB CHARACTERISTICS

- ◆ Teachers also care about working conditions. Working conditions across schools vary dramatically due to differences in student body composition, the character of school administration, available resources, and resource allocation.

If private school teachers are paid so much less than their public school counterparts, why are private schools known for attracting high quality teachers? An important part of the answer is that salaries are only one criterion among many that affect individuals' decisions about whether and where to teach. Many non-wage job characteristics are likely to inform teacher preferences, including attributes of students, class size,



school culture, facilities, leadership and safety. Another reason is that there are fewer obstacles to entry into private school teaching jobs.

Many studies have found evidence that teachers prefer to teach in schools with higher-achieving students. When class size reduction in California resulted in an increase in demand for teachers across the state, for example, teachers in schools with low-achieving students moved to higher-achieving schools. This left many high-poverty districts with vacancies eventually filled by less-qualified instructors.³⁹ Other studies have found that when teachers switch schools, they are more likely to move to schools with higher-achieving and higher socioeconomic-status students.⁴⁰

Student characteristics are likely to influence teachers' work lives, but teachers may also choose schools with more high-achieving and wealthy students because these schools offer other characteristics that teachers prefer, such as better facilities or more preparation time. A recent survey of California teachers shows that turnover is a greater problem and vacancies are more difficult to fill in schools with larger class sizes, where teachers share classrooms (multi-tracking), or where teachers perceive the working conditions to be less appealing.⁴¹ Principals also strongly affect working conditions in a school. Some principals are able to create work environments that teachers find attractive, regardless of the characteristics of the student body.

Working conditions may be even more important than salaries in determining the current distribution of teachers across schools.

Working conditions may be even more important than salaries in determining the current distribution of teachers across schools.⁴² Differences across schools in non-wage attributes of the job will be particularly important when there is little variation in wages, as is the case in many metropolitan areas. At the same time, however, the relative importance of non-wage job attributes in teacher preferences does not rule out the possibility that salary differences could be used to compensate teachers for less favorable working conditions. Favorable working conditions can also attract high-quality teachers. Policies that attract effective administrators, increase preparation time, decrease class size, or provide funds to renovate facilities may add to teachers' perceptions of good working conditions and thus help to equalize the distribution of teachers across schools.

LOCATION

- ◆ The location of the school also appears to be very important for teachers' decisions about where to teach. Teachers, on average, prefer to teach close to where they grew up or in schools similar to the ones they attended as students. This preference makes staffing difficult for schools in areas that need to import teachers, as do many large cities.

In addition to wages and working conditions, school location has a strong influence on the distribution of teachers. Most teachers prefer to teach close to where they grew up and in districts that are similar to the districts they attended as high school students. This preference for home is likely to be true for workers in other professions as well, but it has particularly important consequences for elementary and secondary schooling.

Table 17 shows that most public school teachers take their first public school teaching job very close to their hometown or to the college they attended. Sixty-one percent of teachers who entered public school teaching in New York State between 1999 and 2002 started teaching in a school district located within 15 miles of the district where they graduated from high school. Eighty-five percent entered teaching within 40 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 over 100 miles from where they went to high school returned to within 15 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 in which they are comfortable, independent of the distance from their hometown. Teachers appear to prefer to teach in regions that are 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 urban schools, and those growing up in a suburban area are more likely to teach in the suburbs. Over 90 percent of the teachers whose hometown is New York City and who entered public school teaching from 1999 to 2002 first taught in New York



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TABLE 17
Distance from Home to Most Recent College, and Home to First Job, 1997–2002

		Distance from Home to College				
Distance from Home to Job		0 to 15 miles	15 to 40 miles	40 to 100 miles	100 or more miles	All
0 to 15 miles	Column %	75.6	55.2	49.4	48.0	61.0
	Row %	51.0	17.8	12.3	18.8	100.0
15 to 40 miles	Column %	20.1	34.2	20.8	24.0	23.9
	Row %	34.7	28.1	13.2	24.0	100.0
40 to 100 miles	Column %	2.8	8.1	23.7	8.9	8.5
	Row %	13.8	18.8	42.3	25.1	100.0
100 or more miles	Column %	1.4	2.5	6.2	19.1	6.6
	Row %	8.9	7.6	14.2	69.4	100.0
All	Total %	41.2	19.7	15.2	23.9	100.0
	N	15,891	7,598	5,861	9,238	38,588

City schools. About 60 percent of those with hometowns in the New York City suburbs first taught in those suburbs.

Similar patterns are evident in teachers' decisions about whether to leave their teaching jobs.⁴³ In the late 1990s New York City teachers who grew up in the suburbs of New York City were more than five times more likely to transfer to jobs outside of the city than those who grew up in New York City. Similarly, those from other areas were more than four times more likely to transfer.

Teachers' preferences to teach close to home or in similar settings pose particular challenges to urban districts, because these districts 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 hometown is in an urban area tends to fall far short of the number of positions that need to be filled in urban school districts. As a result, these districts must attract teachers from other

Historically, the graduates of urban high schools have received less adequate educations, forcing the cities to hire from a less-qualified pool of potential teachers.

regions. Teacher candidates who come from suburban or rural hometowns 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 difficult-to-staff urban schools: salary, school conditions and the composition of the student population. In general, urban schools must offer salaries or working conditions that are more attractive than those of the surrounding suburban districts to induce sufficiently qualified candidates to take jobs further from home and in a different type of region. To the extent that they do not offer these inducements, teachers with suburban hometowns 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 have received less adequate educations, forcing the cities to hire from a less-qualified pool of potential teachers, even when the number of local candidates is adequate. Preferences for proximity thus lead to the perpetuation of disparities in the qualifications of teachers. The local nature of the teacher labor market increases the difficulty of breaking the cycle of inadequate education in schools serving the least advantaged students.

DISTRICT HIRING PRACTICES

Teachers' personal decisions are not the only factors affecting the composition of the teacher workforce and differences across schools. District hiring practices, including what administrators look for and where they place teachers, are likely to contribute to disparities in teacher qualifications across schools. Districts with effective hiring practices (e.g., aggressive recruiting, spring job offers) will end up with higher-quality teaching staffs even though they are initially faced with the same pool of potential teachers. Districts that hire earlier are able to recruit their top choices while other districts are left with teachers who could not find jobs elsewhere.⁴⁴

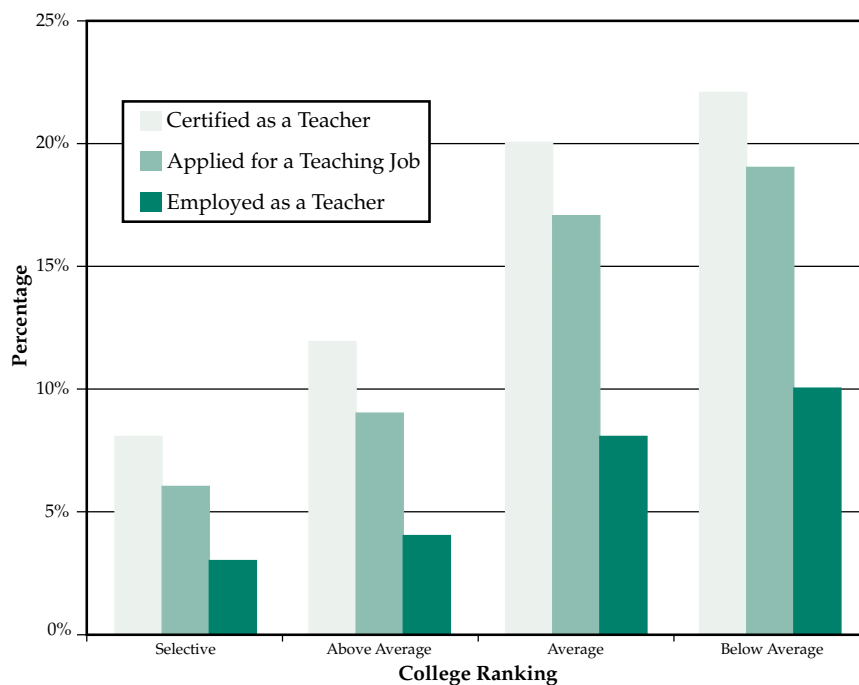
Even within districts, administrators may value certain teacher qualities over others. As a result, one school may strive to hire one type of teacher and another may strive to hire a different type. Even if both schools are choosing from the same pool of potential teachers, they can end up with very different teaching staffs. Schools also vary in the political power they exert, which may lead to differences in teacher qualifications. For example, schools with strong parental involvement may not accept low-quality teachers. When parents and students complain about poor teachers, the teachers may be transferred to schools where parental pressure is not as strong.⁴⁵

There are few studies that give us an in-depth view of the hiring process. One possible indication that schools are not hiring the best available candidates is shown in Figure 15. There are many highly-skilled individuals (defined as those who attended selective undergraduate institutions) who apply for teaching jobs but do not become teachers,

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while many less-qualified individuals do end up teaching. There are three possible explanations for this finding. One is that districts choose not to select the most highly qualified individuals available. A second possibility is that highly qualified individuals are only applying to the schools in which it is most difficult to get a job, including high-achieving suburban schools. Those who do not receive offers from these schools then seek jobs in other occupations rather than in other schools. Finally, schools may hire the best available teachers on the basis of characteristics that are not measured in current datasets.

FIGURE 15
Teachers at Stages of Teacher Recruitment,
by College Ranking, 1976–1991



Source: Ballou, D. (1996). Do Public Schools Hire the Best Applicants? *The Quarterly Journal of Economics*, 111(1), 97–133. (Surveys of Recent College Grads. The measure of college quality is from Barron's *Profiles of American Colleges* (1991).)

A recent study on New York schools and teachers suggests that when given a choice of teachers, administrators tend to choose teachers with higher test scores.⁴⁶ In addition, the fact that some high-ability college graduates are not offered teaching jobs does not imply that high-ability graduates are less likely to be offered jobs. In fact, nationally, of those who applied for jobs, 81 percent of college graduates who scored in the top quartile on their college entrance exams were offered jobs, compared with 70 percent of those in the bottom quartile.⁴⁷ This provides some support for the second explanation proposed above.







VI

PUBLIC POLICY AND TEACHER LABOR MARKETS— A FOCUS ON NEW TEACHERS

Reducing disparities in the distribution of teachers across schools and improving the skills of teachers more generally will require informed public action on several fronts. This report has argued that new policies will have the greatest impact if they target those schools that face the greatest difficulties in attracting and retaining teachers. Broader policy initiatives are likely to be too diffuse to affect the schools and students with the greatest need. Given what we do not yet know about teacher labor markets, developing effective policies to address the needs of these schools will require policy experimentation to learn what kinds of policy changes have the greatest impact.

INCREASING THE APPEAL OF TRADITIONALLY DIFFICULT-TO-FILL TEACHING JOBS

- ◆ Across the board increases in wages or benefits are unlikely to improve the relative quality of teachers in difficult-to-staff schools. *Targeted* policies designed to improve wages and working conditions in these schools will undoubtedly have greater effect in attracting and retaining excellent teachers; however, such targeting requires flexibility in resource allocation that may be politically difficult to achieve.

A number of policy approaches can increase both the quantity and quality of teachers interested in teaching. Salary increases are the most familiar strategy for increasing supply, but schools can also act to improve working conditions by lowering class sizes, making work environments more attractive, or providing more material resources. They may also hire strong leaders who help to create a positive school climate.

As described above, substantial evidence supports the claim that teachers care about wages. An increase in wages increases the number of individuals interested in teaching and the value that teachers place on a given job. Similarly, a downturn in the job stability or wages of other occupations makes teaching relatively more attractive. Improving pay for all teachers may be desirable for a number of reasons, but it is not the most effective means for increasing the supply of teachers, particularly in difficult-to-staff schools.

There are two reasons for this. First, since most teachers have been teaching for many years and expect to continue teaching, an across the



Targeted wage increases for difficult-to-staff schools are likely to have greater impact than across-the-board increases.



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 level of effort and performance of these teachers, but it is not the most effective way to influence the choices of individuals who are currently choosing between teaching and another occupation. Second, many schools do not find recruiting teachers difficult, and those that do may only have trouble finding teachers for particular fields. Increasing wages for teachers who are prepared to accept employment on present terms will result in a misallocation of scarce resources that could be better used for other purposes.

Schools may be difficult-to-staff because of their student body characteristics, facilities, history, or because they are located in regions that produce few college graduates. Targeted wage increases for difficult-to-staff schools, such as Florida's bonus program, are likely to have greater impact than across-the-board increases, as long as they are large enough to get prospective teachers' attention. Similarly, policies targeting potential teachers in difficult-to-staff fields including science and special education, are also likely to be more effective at reducing shortages than generalized salary increases.

Such targeting requires flexibility in resource allocation across and within districts, and administrators rarely have such flexibility. Political pressures make it difficult to reallocate revenues from one set of districts to another. Within districts it is no easier to shift resources, as schools that can easily recruit enough highly-skilled teachers do not want their districts to reallocate funds or expert staff to other schools. Teacher contracts reduce flexibility further by establishing fixed salary schedules and strict hiring procedures within districts.

Many states and a number of large school districts are pursuing salary-based efforts to recruit and retain highly qualified teachers. Perhaps as a result of the difficulty in reallocating resources, however, most of these policies are not targeted at increasing the quality of the teaching force in shortage fields or in high-poverty, high-minority or low-performing schools. Table 18 shows that 35 states currently provide retention bonuses for teachers. Only five of these states target these bonuses to teachers in high-need schools. Six states have instituted housing incentives and another five have offered signing bonuses to new teachers. Similarly, some individual districts use differentiated wage and benefit structures to attract teachers (Table 19). Out of 30 large school districts, ten give signing bonuses to new teachers and nine give housing incentives. Only three of the ten districts that give signing bonuses target high-need schools, as do two of the nine districts that offer housing incentives.

Wage-based approaches, while popular, may not provide sufficient incentives to equalize the distribution of teachers across schools. Improvements in working conditions may offer a lower cost approach, particularly when targeted wage incentives are not politically feasible. An approach that combines targeted wage increases with improved

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	Number of States
Education Assistance	24
Targeted for High-Need Schools	7
Housing Incentives	6
Targeted for High-Need Schools	3
Retention Bonuses	35
Targeted for High-Need Schools	5
Signing Bonuses for New Teachers	5
Targeted for High-Need Schools	2

Source: *Education Week*. (2003). "If I can't learn from you...,' Ensuring a Highly Qualified Teacher for Every Classroom." (Quality Counts 2003 survey of the 50 states and D.C.)

working conditions is likely to be more effective than either policy would be alone.

Capital improvements and better provision of supplies in high-need schools might help attract and retain teachers at a substantially lower cost than increased salaries. Attracting effective school leaders may also entice teachers to work in difficult-to-staff schools. Effective leaders are able to improve school environments by strengthening support systems for teachers, creating lively learning environments and allocating resources effectively, all of which can help to make teachers' work less burdensome and more appealing. The same factors that influence teachers' decisions about where to teach are likely to affect candidates for administrative positions, which suggests that improving the wage and non-wage characteristics of administrative jobs in high-poverty and low-performing schools might also contribute to efforts to attract and retain high quality classroom teachers for these schools.

IMPROVING RECRUITMENT AND HIRING PRACTICES

- ◆ Many high-needs districts do a poor job recruiting teachers. This failure is likely to explain some, though not all, of the differences in the characteristics of teachers across schools.

Capital improvements and better provision of supplies in high-need schools might help attract and retain teachers at a substantially lower cost than increased salaries.

TABLE 19
District Policies to Attract and Retain Qualified Teachers

	Number of Districts Out of 30 Large School Districts
Education Assistance	10
Targeted to high-need schools	2
Housing incentives	9
Targeted to high-need schools	2
Signing bonuses for new teachers	10
Targeted to high-need schools	3
Retention bonuses for veteran teachers	20
Targeted to high-need schools	7
Salary-based incentives	9
Targeted to high-need schools	3
Sponsor alternative-route programs	20
Targeted to high-need schools	6

Source: *Education Week*. (2003). "If I can't learn from you...,' Ensuring a Highly Qualified Teacher for Every Classroom." (Quality Counts, Education Week 2003 district survey of 30 large school districts.)



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 disparities in teacher qualifications across schools and districts. For reasons discussed above, some administrators fail to hire highly qualified individuals who are available to teach in their schools. In large urban districts, for example, administrators may not be permitted to make hiring decisions until late in the year. At this point, top candidates may already have accepted positions elsewhere. Accelerating budget decisions at state and local levels could help to reduce this problem, since administrators are rightly reluctant to hire teachers when funding is uncertain. Streamlining interview and hiring processes within the district could also help to ensure that prospective teachers do not become discouraged and seek positions in other schools.⁴⁸

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It also appears that, given a choice, some administrators exhibit a preference for less-qualified applicants. It is unlikely that these administrators are consciously trying to reduce the quality of their teachers, but they may lack the background and training necessary to make good choices. Specific training could help administrators improve their hiring skills. Another goal of policy should be to encourage highly qualified teachers to apply to more or different schools. This will once again require policies that support targeted incentives and improved working conditions in difficult-to-staff schools.

Another goal of policy should be to encourage highly qualified teachers to apply to more or different schools.

REDUCING BARRIERS FACED BY PROSPECTIVE TEACHERS

- ◆ Certification requirements should balance the benefits of training with the costs. Requirements should not unduly discourage more, and more qualified, individuals from becoming teachers.

Raising education and certification requirements for entering teachers has three potential effects on the teaching workforce. First, increased education may improve skills and better prepare potential teachers for the challenge of classroom teaching, thus creating a more stable workforce. High teacher turnover, exacerbated by poor preparation, is costly to districts for two reasons. First and second year teachers often are not as effective with students as more experienced teachers. In addition, there are direct recruitment and hiring costs when teachers must be replaced.

A second effect of raising entry requirements could be to bar potential teachers from classrooms if they do not meet a minimum standard of competency. At the most rudimentary level, we want to ensure that teachers have a basic knowledge of mathematics and are literate before we allow them to teach others. Higher competencies are generally expected. Most states require teachers to pass certification exams covering general and pedagogical knowledge. In 2002, for example, 44 states required potential teachers to pass written tests in order to receive a beginning-teacher license.⁴⁹

Raising entry requirements may have the potentially positive effects discussed above, but these additional requirements also raise barriers to entry that may discourage highly skilled individuals from considering teaching. The higher the barriers, the greater the wage needed to entice entry into the profession, particularly for candidates with attractive employment alternatives. Pre-service education and testing requirements may discourage potential teachers from entering the profession because of costs in time and money.

High barriers to entering teaching may be a particular problem for schools that have traditionally had the most difficulty attracting teachers, as well as for the most able individuals interested in teaching. In the first case, schools with high proportions of poor and low-performing students attract a small pool of interested applicants. Increased entry requirements may reduce the size of the pool even further. We clearly do not want to recruit unqualified applicants for positions in these challenging schools, but increased requirements may discourage highly qualified prospective teachers along with unqualified ones. To the extent that the new requirements are imprecise in their ability to identify good teachers, or discouraging to highly qualified applicants, they may eliminate some of the better candidates from an already insufficient pool and so disadvantage students in these schools even further.

Barriers may be a particular problem for high-ability teaching candidates, who enjoy ample alternative opportunities. These individuals are more likely to be on the fence between entering teaching and choosing an alternative career which is likely to offer higher wages. These potential teachers may not see a test as a huge barrier, but they may see additional education requirements that demand significant investments of time very differently. If these teachers are unsure of their career choice, they may be unwilling to try teaching if they need to invest too much time before entering the classroom. This is especially so if investment in professional preparation for teaching has little payoff in terms of preparation for other kinds of employment.

Individuals coming to teaching from other careers may be especially sensitive to increased barriers to entry. Many teachers enter the classroom directly from college, but more and more are now entering later in their careers. As noted above, one seventh of first year teachers are 40 years of age or older. These later entrants may be discouraged by testing requirements, particularly if they have been out of school and away from testing for an extended period. They may also be sensitive to coursework requirements if they need to continue to support families as they switch careers.

A third group that may be discouraged by higher entry requirements includes individuals who themselves are graduates of difficult-to-staff schools. Many of these schools are located in poor areas. We know that teachers often return home to teach, so local candidates are more likely to accept positions in these schools than prospective teachers from other areas. Lengthy, expensive preparation programs may discourage local candidates from considering a career in teaching. Persons who grew up in impoverished areas often seek to support themselves and assist their families as quickly as possible. Onerous education requirements may discourage these individuals from teaching and reduce the pool of locally grown teachers available to difficult-to-staff schools.

Sensible training requirements will seek to minimize the costs of entry for teachers while providing them with the skills essential for classroom success. Current training programs may not be as effective as they could

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be, especially for difficult-to-staff schools. They rarely provide training on specific issues involved in teaching in these schools, and they neglect to include mentoring programs that follow new teachers into the classroom and support their development.

At present we have virtually no useful information on what aspects of teacher preparation make a difference in student performance. This information is essential for the design of programs that are both the most effective for improving teacher performance and the least burdensome for individuals considering whether to pursue teaching. Better data are critically important for the design of alternative certification programs, which aim to reduce the barriers to entry for college graduates interested in teaching.

Like the research on other important policies regarding teacher supply, evidence regarding the success of alternative routes in helping to attract and retain high-quality teachers is scarce. Alternative routes vary widely. Some offer course work and experiences very similar to those provided by traditional routes, while others require very little coursework or exposure to students and schools before candidates are given their own classrooms. We know very little about the consequences of alternative programs, in large part because we know very little about the effectiveness of traditional certification programs.

FACILITATING TEACHER CAREERS IN REGIONS WITH FEW TEACHER CANDIDATES

- ◆ Incentives and education programs should encourage individuals to enter the teaching profession in regions that produce relatively few highly-skilled college graduates.

Schools with the most challenging work environments often have the most difficulty recruiting teachers, and geographic areas that are net importers of teachers or those whose schools have not produced enough highly skilled college graduates face particular disadvantages in attracting and retaining teachers. These problems often occur together, compounding the difficulties faced by these schools.

There are few quick cures for this geographic disadvantage. In the long run, policies that encourage strong high school students to pursue further education and teaching careers may expand the pool of potential teachers in these districts. More immediately, we need to ensure that whatever incentives and resources are devoted to increasing the supply of teachers are targeted to the schools and students that need them the most. For example, programs that provide low cost, streamlined, high-quality teacher training to paraprofessionals in difficult-to-staff schools may increase the pool of prospective teachers available to these schools. Paraprofessionals often live in or near the neighborhoods where they work and are enthusiastic about remaining in their current schools. Targeted programs to help them gain the knowledge and skills they need

to enter teaching could help to increase the supply of dedicated, high quality teachers in these schools.

DISCUSSION

This report has provided an overview of the labor market for elementary and secondary school teachers, including descriptions of the size, demographics and qualifications of the current teaching force. It has also summarized current research on how teacher attributes affect student outcomes, and has demonstrated that substantial differences in teacher quality exist between schools serving different student populations. Low-income, minority and low-achieving students are far more likely to be taught by inexperienced teachers with weak academic training. These differences are largely the result of the choices made by teachers, schools and districts when potential teachers enter the job market. They are not just the result of differences in quit and transfer decisions. We must change the initial matching of teachers and schools if we are to reduce disparities in the characteristics of teachers across schools.

We now are left with the question of how to design policies to alleviate these differences and improve the overall quality of teaching. It is clear that policies need to focus where the problem is greatest. Without a concerted effort to target resources of all sorts—from wage increases to highly skilled administrators—to the schools that are most in need, reforms will fail to reduce current disparities in teacher qualifications across schools. Additional policy changes—including improved hiring practices and streamlined teacher education requirements that meet the needs of teachers entering difficult-to-staff schools without creating excessive barriers—are also likely to reduce disparities and improve teaching. There are a number of alternatives, and a willingness to engage in policy experimentation can only improve our knowledge and our ability to design effective policy for improving teaching and the education of students currently in the most difficult-to-staff schools.

