
COMPONENTS OF TEACHER SUPPLY

The total teaching force in Texas at the beginning of any given year is composed of three groups of teachers: (1) continuing teachers who were present and teaching in the previous year, (2) new entrants into the system, and (3) returning teachers (those who were previously teaching in the Texas public school system who are now returning to teaching after a break in service) and migrating teachers (teachers who are transferring from other teaching posts in private schools or from other states). Any assessment of future supply requires information not only on current teachers but also on the teacher training pipeline (students currently in teacher education programs) and on the “reserve pool” of individuals who are qualified to teach but are not currently teaching.¹ Data on these pools of prospective teachers and their likelihood of transitioning into the teacher workforce are hard to come by and even more difficult to forecast. Haggstrom et al. (1988) suggest that we should view supply projections as “conditional estimates that depend on the numbers of prospective teachers in the populations of interest as well as factors, such as certification rules and salary levels, that affect entry rates into the teaching force” (p. 25).

¹The proliferation of alternative certification programs makes the size of this pool potentially very large and increases the difficulty of assessing future supply by several orders of magnitude.

ALL TEACHERS

In 1995–96, the total number of full-time public school teachers in Texas was about 240,000, compared with 152,000 15 years earlier—an increase of 58 percent (Figure 3.1). Table 3.1 presents a profile of the teaching force for selected years by various demographic characteristics. The Texas teaching force, like those of other states, consists predominantly of women; fewer than a quarter are men, which is somewhat lower than the proportion in other states (for example, Indiana). The proportion of minority teachers has increased slightly over time but the racial/ethnic composition has undergone a dramatic change. In 1995–96, Hispanics accounted for 15 percent of the teaching force, 8 percent were black, and fewer than 1 percent were other minority. This represented a sharp change from 1980–81 when Hispanics and blacks were equally represented in the teacher workforce, accounting for about 11 percent each (see also Figure 3.2). The average age of teachers in 1995–96 was 42 years, a marked increase

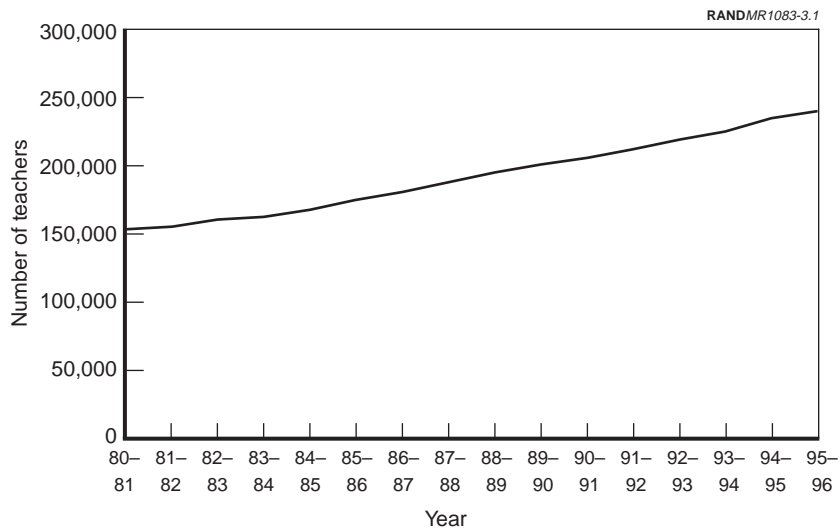


Figure 3.1—Number of Full-Time Teachers in Texas, 1980–81 to 1995–96

Table 3.1
Profile of Texas Teachers, by Selected Characteristics and Years
(in percent)

Characteristic	1980-81	1985-86	1990-91	1995-96
Sex				
Female	75.9	77.4	78.2	77.4
Male	24.1	22.6	21.8	22.6
Race/ethnicity				
Non-Hispanic white	78.2	77.5	77.7	76.1
Hispanic	10.6	12.4	13.2	15.0
Black	10.9	9.8	8.8	8.1
Age				
20-24	4.6	2.9	2.0	1.7
25-29	21.5	15.3	12.1	13.6
30-34	23.1	18.2	14.4	12.2
35-39	17.9	20.8	17.3	13.9
40-44	12.9	16.3	20.1	16.7
45-49	10.4	11.0	14.9	18.5
50-54	6.5	8.4	9.6	12.9
55+	3.1	7.2	9.6	10.5
Years of teaching experience				
0	5.2	5.7	6.1	6.1
1-4	25.3	19.9	19.0	22.3
5-8	22.1	20.5	17.8	15.2
9-12	16.5	18.1	16.3	13.9
13-16	11.0	13.9	14.4	12.3
17-20	7.5	9.1	11.5	11.3
21-24	5.3	5.7	7.3	9.1
25+	7.1	7.1	7.7	9.8
Primary teaching assignment				
Nondepartmental (elementary)	40.5	45.5	52.9	50.3
Special education	9.9	9.7	7.3	7.1
English	8.3	9.1	8.7	8.4
Mathematics	5.8	6.2	6.4	6.2
Physics/chemistry	0.4	0.5	0.6	0.7
Biology	1.2	1.5	2.4	1.8
Other science	2.2	3.0	2.0	2.3
Other departmental	31.7	24.5	21.5	23.2
Continuing/returning/new				
Continuing teachers	85.4	85.2	88.0	89.4
Returning teachers	9.7	9.4	6.7	5.1
New teachers	5.0	5.6	5.5	5.5
Number	152,091	174,696	205,530	239,331

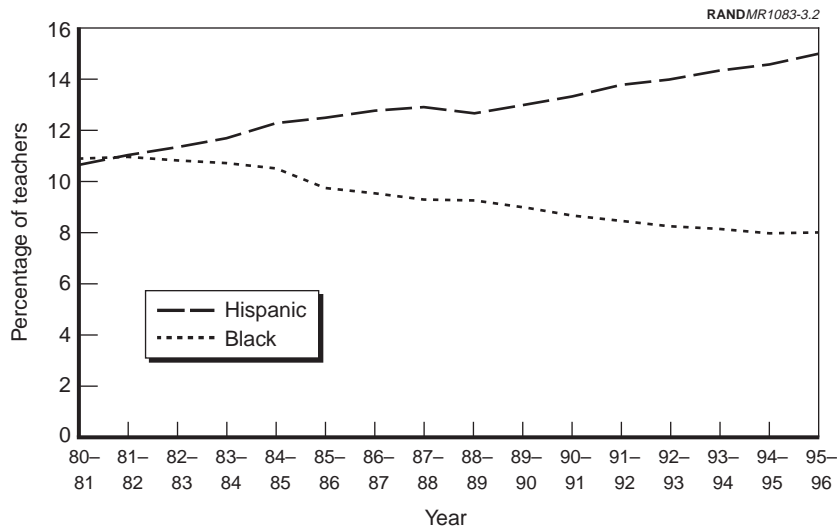


Figure 3.2—Black/Hispanic Teachers as a Proportion of All Teachers, 1980–81 to 1995–96

from 16 years earlier when the average age was 36 years. The gradual aging of the teacher force is evident in the table: In 1980–81, only one in five teachers was 45 years or older; by 1995–96, over two in every five teachers were 45 years or older.² This aging of the teacher workforce implies that the demand for new teachers is likely to increase dramatically in 10–15 years as a spate of retirements hits the public school system.

This aging is matched by an increase in experience. By 1995–96, almost 20 percent of teachers had over 20 years of experience compared with 16 years earlier, when this group accounted for only 12 percent of the force.

About half the teachers teach at the elementary (nondepartmental) level. The proportion of elementary teachers increased by 13

²The aging of the workforce is even more pronounced among black teachers, who are likely to be retiring at disproportionate rates over the next 5 to 15 years. Twenty-nine percent of black teachers are now over the age of 50.

percentage points over the 1980 decade³ but seems to have declined modestly since then as the baby boomlet makes its way through the school system. Unlike what we see in other states, the proportion of special education teachers has actually declined from a high of 10 percent in 1980–81 to a little over 7 percent in 1995–96. The increase in other departmental teachers seen since 1990–91 is primarily due to the increase in bilingual teachers. A recent report on educator demand and supply in Texas reported that the number of bilingual/English as a second language teachers increased by 52 percent between 1989–90 and 1993–94, teachers of gifted programs by 32 percent, followed by foreign language (21 percent), total science (19 percent), and special education (18 percent) (Southern Regional Education Board, 1996).

SOURCES OF SUPPLY

Continuing Teachers

The composition of the teaching force—continuing teachers (defined as returning/migrating teachers, or new, beginning teachers—has important implications for teacher supply and demand.

We find that the proportion of continuing teachers has increased sharply over time, from 85 percent in 1980–81 to 89 percent in 1995–96. In the absence of increasing enrollments or change in educational policies, this would decrease teacher demand. Returning teachers are an important source of supply but over time have declined in importance as a source of new hires. The fact that teachers (both in Texas and the nation as a whole) are tending to continue in teaching in higher proportions suggests that the traditional reserve pool of teachers (the pool of trained, experienced teachers who take a break from teaching and then return) may be much smaller in the future; this is supported by the fact that new, beginning teachers are accounting for a much larger share of new teacher supply. This is true across the nation as well. Data from the Schools and Staffing

³This may be partially due to the state-mandated law passed in 1985 regarding class size. State law required a student/teacher ratio of 25:1. The actual average in K–2 in 1985 was 27:1. By 1988, the K–2 number was reduced to 20–21 students per teacher. The large increase in the proportion of elementary teachers is due partly to this mandate and partly to increased enrollments.

Surveys (SASS) show that both public and private schools are hiring proportionately more first-time teachers than reentrants and transfers. In 1991, new teachers accounted for 42 percent of all hires, compared with only 31 percent in 1988.

New Teachers

The importance of new teachers as a source of supply is underscored by the fact that they currently account for over half of all hires compared with only a third in 1980–81.⁴ The size of this cohort has increased dramatically over time, from about 7,600 in 1980–81 to over 13,000 in 1995–96, an increase of over 70 percent.

Table 3.2 presents a profile of beginning teachers for selected entry cohorts. The proportion of men varies over time but has substantially increased in recent years; in 1995–96, they accounted for about 30 percent of the new teacher cohort.

The racial/ethnic composition of new teacher cohorts shows that Texas has been able to attract increasing numbers of minorities in recent years (Figure 3.3). In 1995–96, minorities represented 26 percent of the new teacher cohort compared with 23 percent of all teachers. Although the Texas report on Teacher Diversity and Recruitment (Texas Education Agency, 1994) points to the low number of black teachers in the state and writes that this is “of particular concern because African Americans are joining the teaching force in smaller and smaller numbers” (p. 25), the last two years have seen an increase in the proportion of new teachers who are black. In addition, the trends with regard to Hispanic recruitment and retention appear to be even more positive. Hispanics currently account for 18 percent of new teachers, compared with 12 percent in 1988–89, whereas blacks constitute 9 percent. Texas has undertaken a serious effort to recruit and retain minority teachers (Texas Education Agency, 1994), and it deserves credit for a great deal of success in these areas.

New teachers are entering teaching at older ages. Over time, the average age of new teachers has increased from 27.7 to 31 years.

⁴This is true across the nation as well.

Table 3.2
Profile of New Teachers, by Selected Characteristics and Years
(in percent)

Characteristic	1980-81	1985-86	1990-91	1995-96
Sex				
Female	76.3	81.2	77.5	70.2
Male	23.7	18.8	22.5	29.8
Race				
Non-Hispanic white	79.8	81.1	77.8	72.4
Hispanic	13.3	11.1	15.2	17.2
Black	6.5	7.5	6.3	8.9
Age				
20-24	45.0	33.0	25.0	20.9
25-29	32.2	35.9	35.5	40.3
30-34	11.1	12.5	13.1	11.7
35-39	5.6	9.8	11.3	9.3
40-44	3.2	4.9	8.7	8.4
45-49	1.7	2.4	3.6	5.5
50-54	0.8	1.1	1.5	2.3
55+	0.5	0.5	1.3	1.5
Primary teaching assignment				
Nondepartmental (elementary)	37.4	51.2	57.1	46.8
Special education	13.5	8.1	8.0	8.5
English	6.8	7.8	9.2	9.1
Mathematics	5.0	6.2	6.1	7.1
Physics/chemistry	0.2	0.3	0.4	0.5
Biology	1.0	1.8	2.5	2.3
Other science	2.9	4.6	2.5	3.0
Other departmental	33.2	20.0	14.2	22.7
Number	7,661	9,735	11,303	13,264

Whereas in 1980-81 young teachers, who were 20-24 years of age and presumably new college graduates, formed the majority of entering teachers, by 1995-96, teachers aged 25-29 years accounted for two-fifths of all beginning teachers entering teaching; well over a quarter—27 percent—were 35 years or older. This suggests either that new graduates are postponing teaching, perhaps to stay in school longer or to try other occupations, or that alternative certification programs are successfully attracting graduates from other occupations. The trend in the age distribution has important

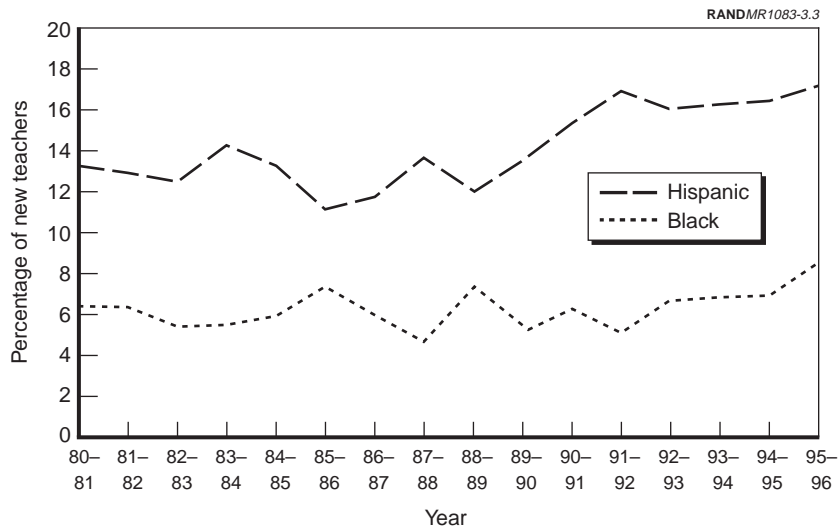


Figure 3.3—Black/Hispanic Teachers as a Proportion of New Teachers, 1980–81 to 1995–96

implications both for future supply—older teachers tend to stay in teaching thus reducing the reserve pool—and for future demand—there is a greater need to replace such teachers after comparatively short careers.

As we reported above when discussing the total teaching force, the proportion of elementary teachers increased sharply over a 10-year period to match enrollment increases and to comply with the mandate of lower class sizes. By 1990–91, about 57 percent of all beginning teachers hired were for the elementary level; this declined quite sharply by 10 percentage points to 47 percent in 1995–96 as the baby boomlet moved from elementary to secondary schools.

Who Is in the Teacher Pipeline?

However, the pipeline of new Texas teacher graduates does not look very promising. There are two major hurdles to becoming a teacher: (a) the Texas Academic Skills Program (TASP) test (instituted in 1989), which must be passed before enrolling in teacher education

coursework beyond six hours; and (b) the Examination for Certification of Educators in Texas (ExCET), which must be taken even by out-of-state teachers wishing to teach in Texas. The ExCET consists of a series of subject and program-specific competency tests. The Texas study (Texas Education Agency, 1994) followed a cohort of students enrolled in the seventh grade in 1982–83 through college and students' attempts to obtain a teaching certificate. Of the original pool of over 250,000 students, fewer than 10,000 passed all the requirements to become a teacher. The major hurdles for minorities were graduation from high school and enrollment in college. For example, only about 37 percent of the original cohort of minorities enrolled in college compared with 60 percent of whites. Of these freshmen, a small percentage (12 percent of whites and Hispanics and 6 percent of blacks) applied to become teacher education majors. The TASP and the ExCET proved to be a harder barrier for minorities than for non-Hispanic whites. For example, in 1988–89, only 76 percent of Hispanic students and 66 percent of black students passed the TASP compared with over 90 percent of non-Hispanic white students. In 1991–92, 85 percent of Hispanic examinees and 72 percent of black examinees passed the ExCET compared with 95 percent of non-Hispanic white examinees. Of those newly eligible to teach, 14 percent were Hispanic and 3.2 percent were black.

In addition, a Southern Regional Education Board report (1996) offers an important snapshot of new teacher graduates as of 1990–91. Of those receiving a bachelor's degree in education that year, 77 percent were non-Hispanic white, 18 percent were Hispanic, and 4 percent were black. Only 5 percent of these were minority men (4 percent Hispanic and 1 percent black). However, not all of these individuals entered teaching. Among 1989–1991 graduates, on average, approximately 45–55 percent of all those receiving bachelor's degrees in education entered teaching within one year of graduation and about 60 percent within three years of receiving the degree; but the yield rate differs by race/ethnicity. Hispanic teachers—both male and female—tend to have the highest first-year yield rates (about 54 percent for 1991). Blacks, especially black males, have the lowest yield rates (45 percent for black females, 28 percent for black males). White females had a first-year yield rate of 52 percent in 1991 and white males had a yield rate of 39 percent.

Other Sources of Supply

Clearly, however, new teacher graduates are only one component of teacher supply in the state. In 1993–94, 51 percent of all new teachers were graduates of university-based teacher preparation programs. In addition, Alternative Certification Programs (ACPs) prepared 17 percent of new hires. The term “alternative certification” (AC) encompasses all avenues whereby an individual, not traditionally prepared in schools of education, can become licensed to teach. These avenues range from programs that place teachers with little or no training in schools to well-designed, rigorous programs aimed at individuals with subject matter knowledge. There is considerable controversy over AC programs and the quality of the teachers they prepare.⁵ AC programs are diverse and widespread, but there is little empirical evidence on the effect of these programs on students, on teachers and the teacher labor

⁵For example, proponents of AC programs argue that they can help reduce teacher shortage problems in urban areas and in specific subject areas such as mathematics and science (Stoddart and Floden, 1995; Shen 1997); ACPs can provide greater opportunities for those with deep subject matter knowledge and enthusiasm for teaching (Kearns, 1990; Kerr, 1983; Kramer, 1991); there is little difference between these teachers and more traditionally prepared teachers in terms of knowledge or instructional practice (Ball and Wilson, 1990), or in terms of student outcomes (Goldhaber and Brewer, forthcoming); AC attracts both teachers who have “real world” labor market experiences that would serve them well in the classroom and minorities and males who may serve as role models (Cornett, 1990; Haberman, 1990; Kirby et al., 1989; Ludwig and Stapleton, 1995; Stoddard, 1992); AC can be a good source of teachers willing to teach in urban schools (Natriello and Zumwalt, 1993; Feistritzer and Chester, 1998); AC programs reduce the costs of teacher training and so lower barriers to entry which may entice high-quality individuals to enter the profession (Kirby et al., 1989; Ballou and Podgursky, 1998); AC programs help break up the virtual monopoly that university-based schools of education have had on teacher preparation and introduce competition that can force such schools to rethink and redesign their programs (Bliss, 1990; Cornett, 1990; Fenstermacher, 1990).

However, opponents of AC programs point out that some programs may result in lower professional standards allowing poorly prepared teachers into schools (Darling-Hammond, 1990, 1994; Kirby et al., 1989); AC programs start with an assumption that knowledge of subject matter is the basis of good teaching, an assumption that has been sharply criticized (Feiman-Nemser and Buchanan, 1987; Kennedy, 1991; Zeichner, 1986); several researchers have argued that pedagogical content knowledge is very important in knowing how to teach (Darling-Hammond, 1990; Gomez and Stoddart, 1991; Grossman, 1989a, 1989b; McDiarmid and Wilson, 1991; Stoddart, 1991); AC has not fulfilled its promise to bring into teaching those with higher academic qualifications (Natriello et al., 1990; Shen, 1997); and AC teachers do not have the same commitment to teaching as a career as more traditionally prepared teachers (Shen, 1997).

market, and on schools. However, given the large numbers of new teachers that will be needed over the next decade, a better understanding of the effectiveness of alternative certification programs is of central importance to improving educational outcomes, particularly in large, urban, high-poverty, high-minority school districts.

Among ACP graduates who passed the ExCET, 46 percent were minority so these programs are an important and fruitful source of supply of minority teachers.⁶

Some new teachers came from other routes (from other states, for example). These are a poor source of minority teachers in Texas (in 1991-92, only 9 percent of out-of-state teachers who passed the ExCET were minority).

Another source of supply is teachers with emergency certifications⁷; these usually form a very small proportion of new teachers but in times of perceived shortages of certified teachers, their numbers are likely to rise. We discuss this further below.

TEACHERS IN AT-RISK DISTRICTS

There are indications that high- and medium-risk districts have been facing a shortage of qualified teachers. When a teaching position cannot be filled by a candidate certified in the required field, or possibly in any field, districts must fall back on a variety of short-term measures, including issuing temporary teaching permits that allow individuals to teach without full certification.⁸ Overall, these num-

⁶The Texas Education Agency report (1996b) on teacher preparation reports that several campus administrators expressed a preference for hiring university-trained teachers rather than ACP graduates and also suggested that ACP interns required far more support than other teachers in terms of classroom management and student discipline. However, ACP graduates were less likely to leave within the first five years than other new teachers.

⁷Sometimes these teachers are included among alternatively certified teachers.

⁸Five types of permits currently allow teaching without appropriate certification. Four are used for persons seeking the necessary certification and are issued for varying lengths of time. The fifth is issued by a district and approved by the commissioner of education. It is for degreed individuals who do not have any type of teaching credential. These permits can be used indefinitely in the issuing district.

bers are small but our data indicate that high-risk districts have been forced to rely on these noncertified teachers to a greater degree than low-risk districts as a short-term solution to a potential shortage of qualified teachers.

Figure 3.4 shows the average proportion of teachers holding permits in low-, medium-, and high-risk districts. In 1995–96, 5.6 percent of teachers had permits in the average high-risk district, compared with 3.4 percent in the average low-risk district.⁹ These figures represent an improvement over 1989–90, when over 9 percent of teachers had permits in the average high-risk district. It is very likely that these percentages are higher today than in 1995–96, given the overall shortage of teachers being reported nationwide.

There are also differences among districts in the educational attainment of teachers, although there is some controversy over whether advanced degrees translate into higher quality. High-risk districts have fewer teachers with advanced degrees: 25.3 percent, compared with 29.2 percent for low-risk districts.¹⁰ What is more troubling, however, is that high-risk districts also hire more teachers with no degree. These teachers may be career and technology teachers who are certified based on other professional qualifications, full-time substitute teachers, aides reported as teachers of record, or alternative certification interns on probationary certificates while working on full certification (Texas Education Agency, 1995). Although career and technology teachers and alternative certification interns may be good-quality, career-track hires, full-time substitutes and aides working as teachers of record are more temporary and are used only when districts are unable to fill positions with qualified, permanent teachers.

⁹These figures are calculated at the district level and are biased upward because of the higher percentages of teachers with permits in small districts. In 1995–96, 3.5 percent of all Texas teachers had one or more permits, compared with 4.2 percent in 1990–91.

¹⁰It should be noted that a relatively low proportion of teachers in Texas have advanced degrees compared with other states. Over the past decade this proportion has been steadily falling in Texas, probably reflecting the lack of an effective incentive program. In 1984–85, 36.2 percent had advanced degrees and by 1996–97 this had fallen to only 27.2 percent. The 1993–94 SASS reports that nationally 47.3 percent of teachers have advanced degrees (U.S. Department of Education, 1997).

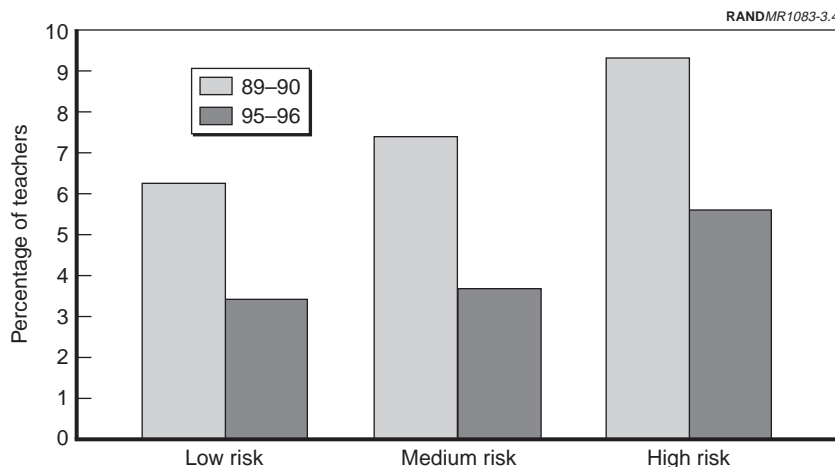


Figure 3.4—Teachers with Permits in Low-, Medium-, and High-Risk Districts, 1989-90 and 1995-96

Figure 3.5 shows the proportion of new teachers with no degree in the three risk districts since 1987-88. The percentage of nondegreed teachers has generally declined in medium- and low-risk districts over this period, but the upward trend in high-risk districts since 1991-92 is disturbing. New teachers with no degree also tend to be disproportionately minority. For example, 14 percent of black and 10 percent of Hispanic teachers hired from 1987-88 to 1995-96 had no degree, compared with only 3 percent of non-Hispanic white teachers. The evidence suggests that urban and at-risk districts that rely on the minority labor force are facing a shortage of qualified applicants who are willing to work in these districts. We find that many of the teachers without degrees do appear to be hired on a temporary basis in response to supply shortages. Evidence of this can be found in the attrition behavior of teachers without degrees. Nearly 40 percent of these teachers leave after one year, compared

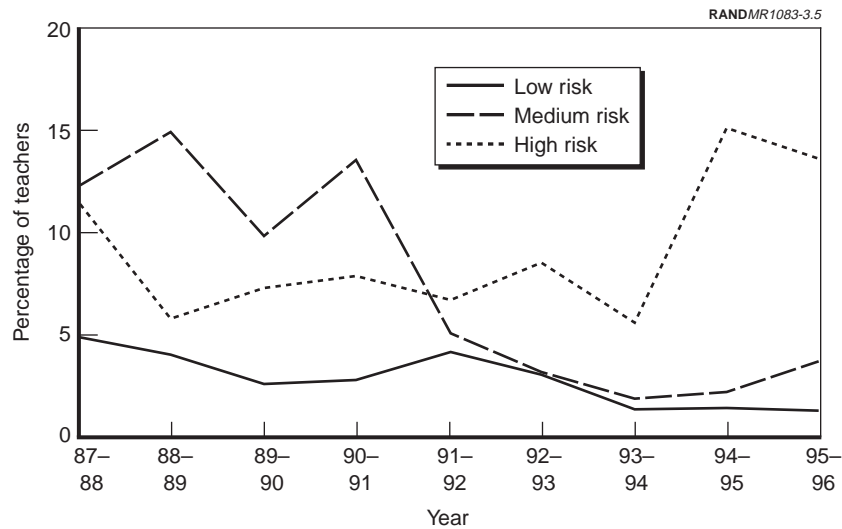


Figure 3.5—New Teachers Without a Degree in Low-, Medium-, and High-Risk Districts, 1987–88 to 1995–96

with 14 percent of new teachers who hold bachelor's degrees.¹¹ The use of teachers with no degree is most prevalent in major urban areas, where about half of all these teachers are hired.

High turnover among teachers or sharply increasing demand lead to a less experienced workforce. Experience is an important concern in teaching because performance tends to improve with experience, particularly during the first several years of a career (Murnane and Phillips, 1981a, 1981b; Hanushek et al., 1998). Compared with low- and medium-risk districts, high-risk districts on average have a higher proportion of novice teachers (Figure 3.6). Not surprisingly, teachers in high-risk districts also have a lower average level of experience—10.6 years compared with 11.7 and 11.4 in medium- and low-risk districts.

¹¹First-year attrition rates are particularly high among new, black teachers with no degree; these teachers have a first-year attrition rate of 55 percent. Our multivariate analysis confirms that teachers with no degree have dramatically higher attrition rates, particularly black and Hispanic teachers.

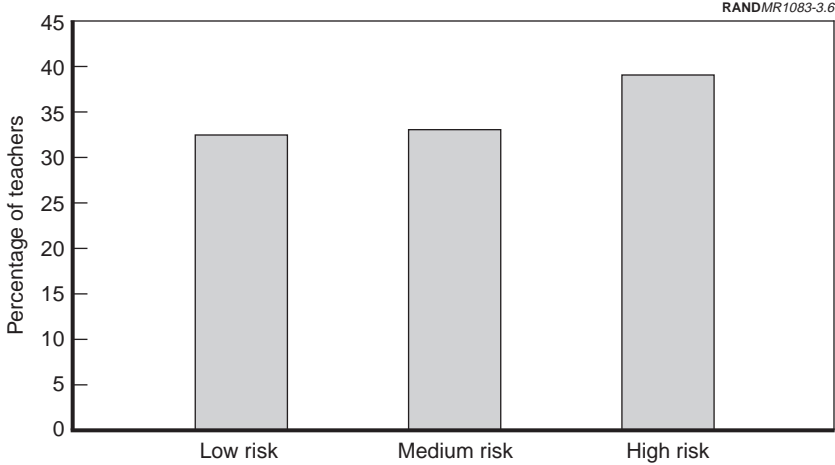


Figure 3.6—Teachers with Fewer Than Five Years of Experience in Low-, Medium-, and High-Risk Districts, 1995-96

All in all, the evidence provided here paints a somewhat pessimistic picture of teacher supply and teacher quality (as measured by certification, educational attainment, and experience) in high-risk districts. Other studies (Ferguson, 1998) also find that teacher quality is generally lower in high-risk districts, as do national data from the Schools and Staffing Surveys (Choy et al., 1992).