

Seven Trends: The Transformation of the Teaching Force¹

by

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Has the elementary and secondary teaching force changed in recent years? And, if so, how? Have the types and kinds of individuals going into teaching changed? Have the demographic characteristics of those working in classrooms altered? To answer these questions we embarked on an exploratory research project to try to discover what trends and changes have, or have not, occurred in the teaching force over the past few decades. We were surprised by what we found. We discovered that the teaching force has been and is greatly changing; yet, even the most dramatic trends appear to have been little noticed by researchers, policy makers, and the public.

To explore these questions, we used the largest and most comprehensive source of data on teachers available—the Schools and Staffing Survey (SASS) and its supplement, the Teacher Follow-Up Survey (TFS). These data are collected by the National Center for Education Statistics (NCES), the statistical arm of the U.S. Department of Education. NCES administers questionnaires to a random sample of about 50,000 teachers, representing all types of teachers, schools, districts, and all 50 states in order to be nationally representative. NCES has administered six cycles of SASS over a 20-year period—1987-88, 1990-91, 1993-94, 1999-2000, 2003-04 and 2007-08 (for information on SASS, see NCES, 2005). Unlike many large-scale surveys, SASS and TFS focus on teachers rather than students. We decided to take advantage of both the depth and duration of these data to explore what changes have taken place in the teaching force and teaching occupation over the two decades from 1987 to 2008. Below, we summarize seven of the most prominent trends and changes we found:

- 1.) Ballooning**
- 2.) Graying**
- 3.) Greening**
- 4.) Becoming More Female**
- 5.) Diversifying**
- 6.) Not Declining in Academic Ability**
- 7.) Destabilizing**

For each of the trends, two large questions arise:

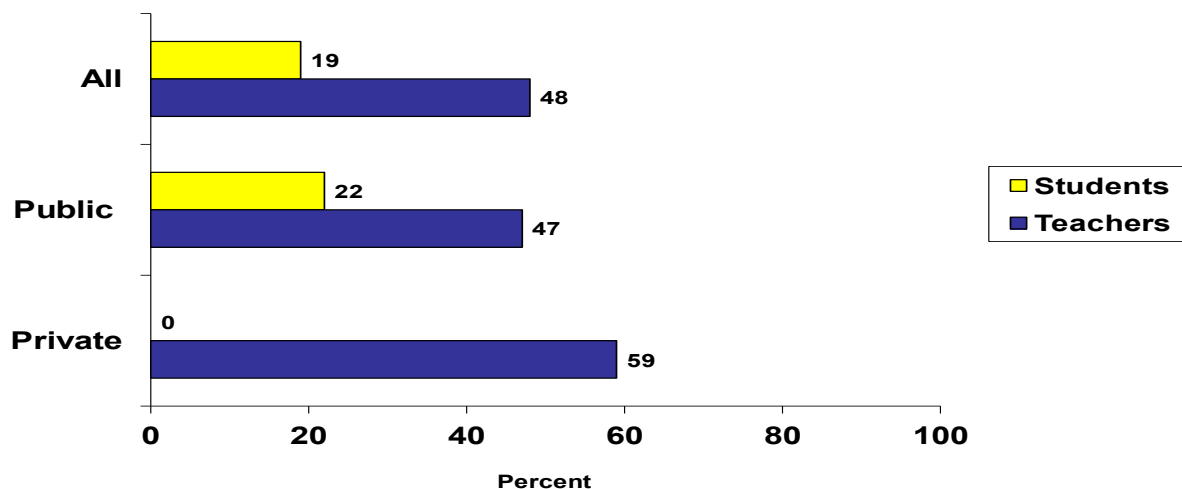
- (1.) Why? What are the reasons for and sources of the trend?
- (2.) So what? What difference does it make? What are the implications and consequences of the trend?

We will offer some possible answers to these questions. But our intent here is not to try to arrive at closure; that would require far more extensive analyses. Our work here is largely exploratory and suggestive, rather than explanatory and evaluative. In short, we ask more questions than we are able to answer. We plan to soon undertake further research to rectify that. There is, moreover, the question of whether the trends we have found will continue. The available SASS data go up to 2008, hence it is unclear what has happened since. We plan to address that question when the next cycle of the SASS/TFS data are released in 2013.

Trend 1: Ballooning

The teaching force has ballooned in size. The Census Bureau indicates that PreK-12 teachers form the largest occupational group in the nation (Bureau of Labor Statistics, 2011), and it is growing even larger. Growth in the numbers of students and teachers is not new. The numbers of both students and teachers grew throughout the 20th century, and the rate of growth for both groups began to soar in the late 1940s with the post-World War II baby boom and the emergence of the comprehensive high school. In 1970, student enrollments peaked and then declined until the mid 1980s. During this period the numbers of teachers also peaked, but then leveled off. By the mid 1980s, elementary and secondary student enrollments again began to grow. Since then, the teaching force has also been increasing in number. The rate of these increases has not matched those of the baby boom years—with one large difference. In recent years, the rate of increase for teachers has far outpaced the rate of increase for students—that is, the number of teachers is going up far faster than is the number of students. As the top of Figure 1 shows, in the two decades from 1987 to 2008, total K-12 student enrollment in the nation (public, private, and charter combined), went up by 19 percent. During the same period the teaching force increased at over two times that rate, by 48 percent.

Figure 1: Percent Increase in Students and Teachers, by School Type, from 1987-88 to 2007-08



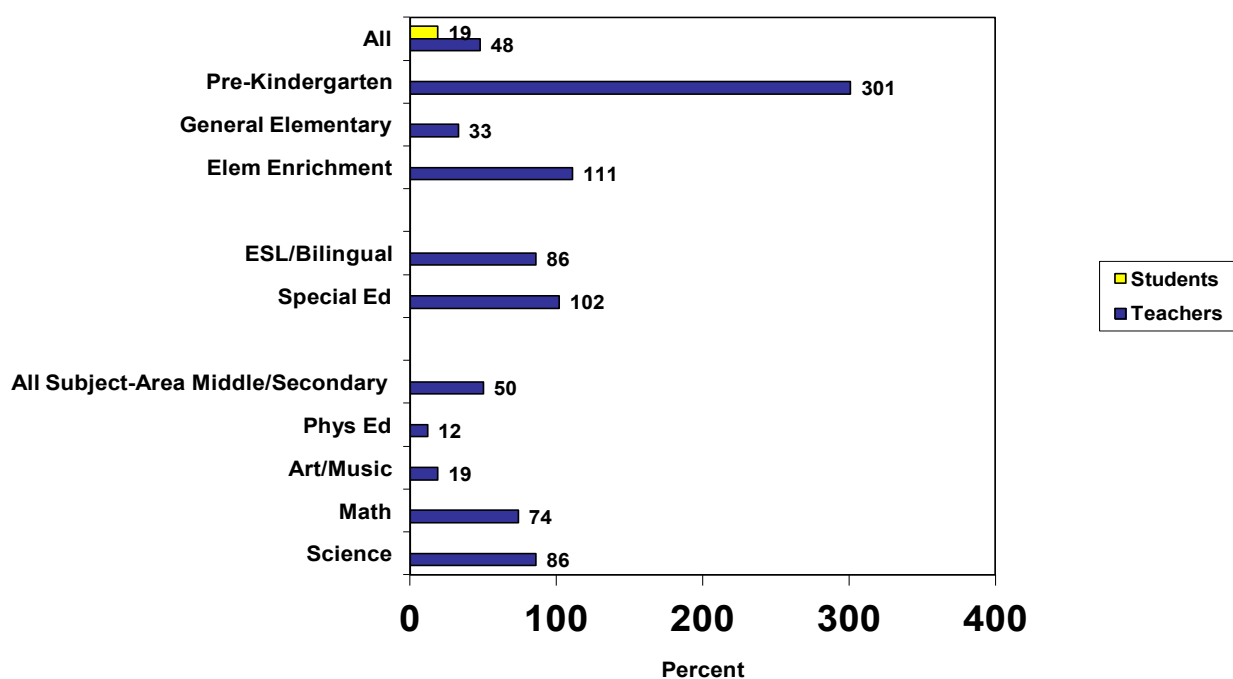
What accounts for this ballooning of the teaching force?

Interestingly, the number of teachers employed in private schools has increased at a faster rate than in public schools (see Figure 1). But, surprisingly, while the total number of teachers in private schools increased, students did not. This also varied by type of private school. The two decades from 1987 to 2008 saw a 21 percent increase in the number of teachers employed in Catholic schools, while there was a 22 percent *decrease* in both the number of Catholic schools and in the total number of students enrolled in them. On the other hand, there were large increases in the total number of schools, students and teachers in the non-Catholic religious

private school sector and in the non-sectarian private school sector. The overall result has been a sharp decrease in the average pupil-teacher ratio and average class sizes in private schools, which were already lower than in public schools. However, this reduction in the student-to-teacher load in private schools does not account for much of the overall ballooning because private schools only account for a small portion (about 12%) of the teaching force.

Charter schools have dramatically grown in number over the past couple of decades, but they account for even less of the ballooning than do private schools because they represent a tiny segment of schools (about 3%) and of the teaching force (about 1%).

Figure 2: Percent Increase in Students and Teachers, by Field from 1987-88 to 2007-08



Another possible explanation for ballooning is that a reduction in public school teachers' workloads—class sizes, hours worked, or classes taught per day—has necessitated an increase in the number of teachers employed. Some states, such as California, implemented class size reduction reforms to great fanfare. On close examination this explanation does accounts for a part of the ballooning of teachers, but not as much as one might expect.

Public school elementary-level class size did decrease by 20 percent during this period, from an average of 26.2 to 21.1 students per general elementary school classroom. Accordingly, the number of general elementary school teachers increased, and because elementary teachers comprise almost a third of the teaching force, their increase explains about a quarter of the ballooning.

In contrast to elementary classrooms, typical subject-area courses at the public middle and secondary school levels experienced little change in class size during this period. Indeed, there was a slight increase in the workload of subject-area teachers at the middle and secondary school levels—the number of class periods that teachers taught per day increased. And, at all grade levels, the average number of instructional hours that teachers work per week slightly increased.

Other, but smaller sources of the ballooning have been dramatic increases in the number of pre-kindergarten teachers, bilingual/English-as-a-second-language teachers, and those teaching elementary enrichment classes (These are instructors who teach only one subject, such as art, music, physical education, computer science, or math, to most of the students in a given elementary school). But, despite these increases, these three types of teachers combined remain a small segment of the teaching force, and hence, their increase accounts for only 5 percent of the ballooning.

The data indicate that a far more significant source of the ballooning has been the growth of special education, no doubt linked to changes in the Individuals with Disabilities Education Act, the main federal special education legislation. As Figure 2 shows, the number of teachers with college degrees in special education increased by 102 percent, compared to 33 percent for general elementary school teachers. Special education classes average about half the size of typical classes in elementary and secondary schools. The increase in special education teachers alone accounts for almost one-fifth of the entire increase in the teaching force.

As the teaching force has grown, it has also experienced large shifts at the middle and secondary levels. Overall, the number of typical subject-area teachers at the middle and secondary school level has increased by 50 percent. But there has also been a large redistribution of these teachers across fields, with winners and losers. Among the losers are art, music and physical education. Among the winners, besides special education, are math and science. The number of teachers with math or math education degrees has gone up by 74 percent. The number of teachers with degrees in one of the sciences or in science education has gone up by 86 percent. Although there are two and half times as many general elementary teachers as math and science teachers, the latter's increase accounts for almost as much of the overall ballooning as does the increase in general elementary teachers. Interestingly, the data also show that the fastest rate of increase among math and science teachers occurred during the 1990s, before the advent of the No Child Left Behind Act.

A major factor in the growth of math and science teachers appears to be changes in high-school graduation requirements across the nation. Graduation requirements for core subjects, especially math and science, increased during this period. This change meant that students took more math and science courses. The data show that the number of students enrolled in math and science classes went up by 69 percent and 60 percent, respectively, in turn driving the large increase in the employment of teachers qualified in those subjects.

Another factor behind the ballooning may be ongoing increases in the number and range of programs and curricula that schools offer, especially at the secondary level. Educational

historians tell us that this programmatic expansion has been going on for a century, as schools have continually been asked to take on more and more goals and tasks that were once the responsibility of parents, families and communities (Kirst, 1984). However, we have not yet uncovered all of the factors behind the ballooning of the teaching force.

Given the large implications, there are, however, good reasons to investigate the sources of the rapid growth in the teaching force. One sobering implication is the cost of this expansion of the teaching force, since teacher salaries are the largest item in school district budgets. How have school systems been able to cope with such an increase in their largest budget item, and who pays for it? How much of the increase in special education staff has been covered by federal, state or local funding to schools?

Given the economic downturn that began in 2008 we might also expect this ballooning and hiring to have leveled off in the past several years. To see if this has been the case, we examined more recent data on the employment of teachers from the Bureau of Labor Statistics (BLS) and from NCES' Common Core of Public School Data (CCD). These databases are not as comprehensive as the SASS data, and they each differ a bit in who they do, or do not, count as teachers (e.g. teacher aides, substitute teachers, part-time teachers, pre-school teachers, etc.), but they are useful and we found fairly consistent in what they reveal about changes in the size of the teaching force.

The CCD data show that during the 3-year period from 2008 to 2011, total students enrolled in public schools continued to slowly increase, and in some fields – pre-kindergarten in particular – the number of teachers also increased. But, these databases also both show that, as expected, the ballooning has slowed and in fact the total number of employed elementary and secondary teachers actually declined slightly (by between 1% and 2%) between 2008 and 2011. It is unclear from the data how much of this decrease was due to hiring freezes or to teacher layoffs.

Some commentators, such as Nobel Laureate economist Paul Krugman (2012), have argued that the current economic recession could be kick-started into recovery if those teachers that were laid off during the past several years were simply rehired. However, the decline in the teaching force over that period of time was small compared to the ballooning the teaching force experienced since the late 1980s. Between the CCD and BLS data, it appears the net decline in the teaching force was between 50,000 and 80,000 teachers from 2008 to 2011. In contrast, in the preceding two-decade period the teaching force increased by about 1.3 million. Of course, a key question is whether the ballooning will pick up again if and when the economy improves.

Another implication of the ballooning is for the much-heralded math and science teacher shortage. We have explored this issue in depth elsewhere (see Ingersoll & Perda 2010; Ingersoll 2011). Among other findings, the data show that, contrary to conventional wisdom, the growth in the new supply and employment of qualified math and science teachers has not only more than kept pace with increases in math and science student enrollments, but also with math and science teacher retirement increases.

Trend 2: Graying

The teaching force has been getting older. We have often heard about this trend because of its link to teacher shortages. Since the mid 1980s, numerous highly publicized reports have warned of a coming educational crisis caused by severe teacher shortages in elementary and secondary schools (e.g., National Commission on Excellence in Education, 1983; National Academy of Sciences, 1987; National Commission on Teaching and America's Future, 1996, 1997). These reports predicted a dramatic increase in the demand for new teachers, primarily as a result of two converging demographic trends—increasing student enrollments and increasing teacher retirements due to a “graying” teaching force. Shortfalls of teachers, the argument went, would force many school systems to resort to lowering standards to fill teaching openings, inevitably resulting in high numbers of underqualified teachers and lower school performance. In recent years, high-profile reports from organizations such as the John Glenn Commission on Mathematics and Science Teaching for the 21st Century (2000), the National Research Council (2002), and the National Academy of Sciences (2007) have directly tied teacher shortages, especially in mathematics and science, to a host of educational and societal problems: from the inability to meet student achievement goals, to low U.S. educational performance compared to other nations, to the minority achievement gap, to national economic competitiveness, and even to the security of the nation.

Our data confirm this demographic trend—the teaching force has gotten older, and teacher retirements have steadily increased. But our analyses also show that this trend is largely over, and the continuing stream of reports that mention the aging teaching force are simply repeating an old story that will soon no longer be true. As Figure 3 shows, in 1987-88 the age distribution of teachers was shaped like a tall peak. The modal or most common age was 41. As the years have gone, by this group has aged, and as Figure 3 also shows, by 2007-08 the modal age of the teaching force was 55. The number of teachers 50 years or older increased, from about 530,000 in 1988 to 1.3 million in 2008. As a result, the number of teacher retirements has also increased, from 35,000 in 1988 to 85,000 in 2008. Our analyses indicate that the modal age of retirement for teachers has been 59, suggesting that the number of teachers retiring should currently be near an all-time high. In fact, we have found that the number of teachers retiring has already begun to decrease, from 87,000 in 2004 to 85,000 in 2008.

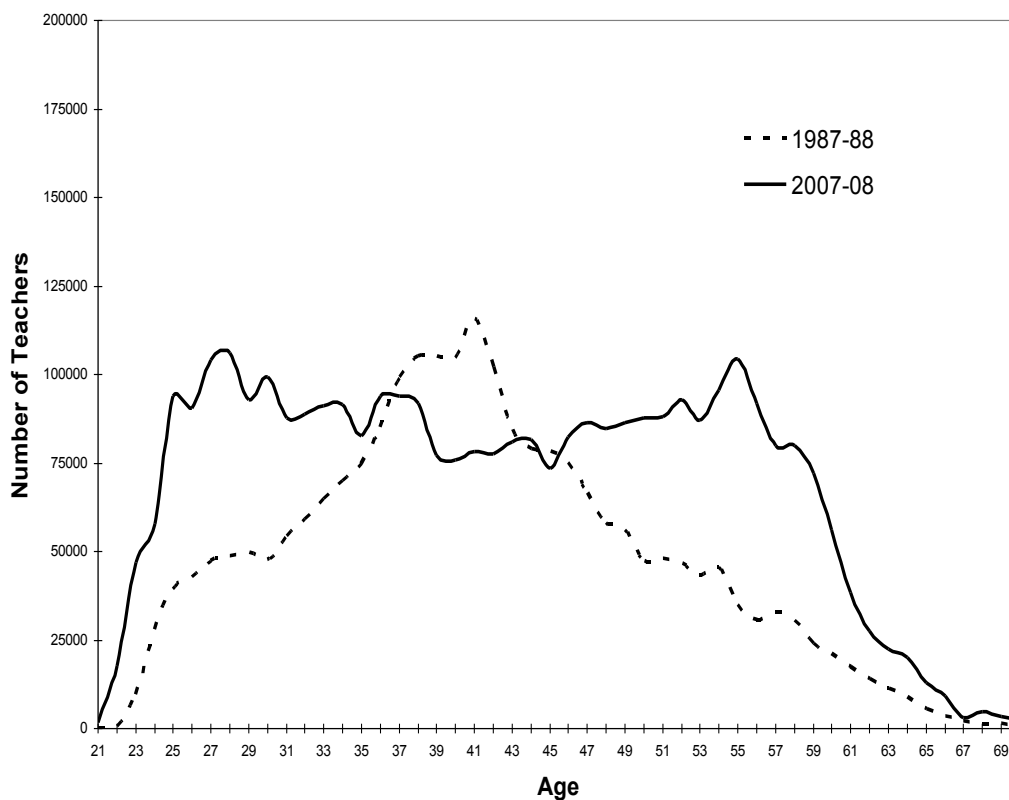
What are the implications of this trend?

The aging of the teaching force has large cost implications for both school budgets and for state pension systems—an issue that has received much media and policy attention in recent years. Veteran teachers earn higher salaries, which, in turn, can strain school and district budgets. Increases in the number of retirees mean larger outlays from state pension plans. But in discussions of the dire future for pension systems, another factor has been overlooked; if schools replace retirees with new teachers, who earn lower salaries, and who pay into state pension plans, these additional costs could be lessened. As we will discuss in Trend 3, not only have retirees been replaced with newcomers, the flow of newcomers has become a flood.

Another implication of aging, as noted earlier, is its impact on the supply of teachers. Conventional wisdom has long held that retirements are a major factor behind teacher shortages.

But teacher retirements have always represented only a small portion of all of those leaving teaching—less than a third in recent years. And, if you look at all departures of teachers from schools (both those moving between schools and those leaving teaching altogether), retirement is only about 14 percent of the total outflow. In our research on the teacher shortage, we have found that not only has the supply of qualified teachers been more than enough to replace retirements in fields such as math and science, but also that pre-retirement voluntary turnover creates far more staffing problems for schools than does retirement (see Ingersoll & Perda, 2010; Ingersoll, 2011), an issue we will return to in Trend 7.

**Figure 3: Age of Public School Teachers,
1987-88 and 2007-08**

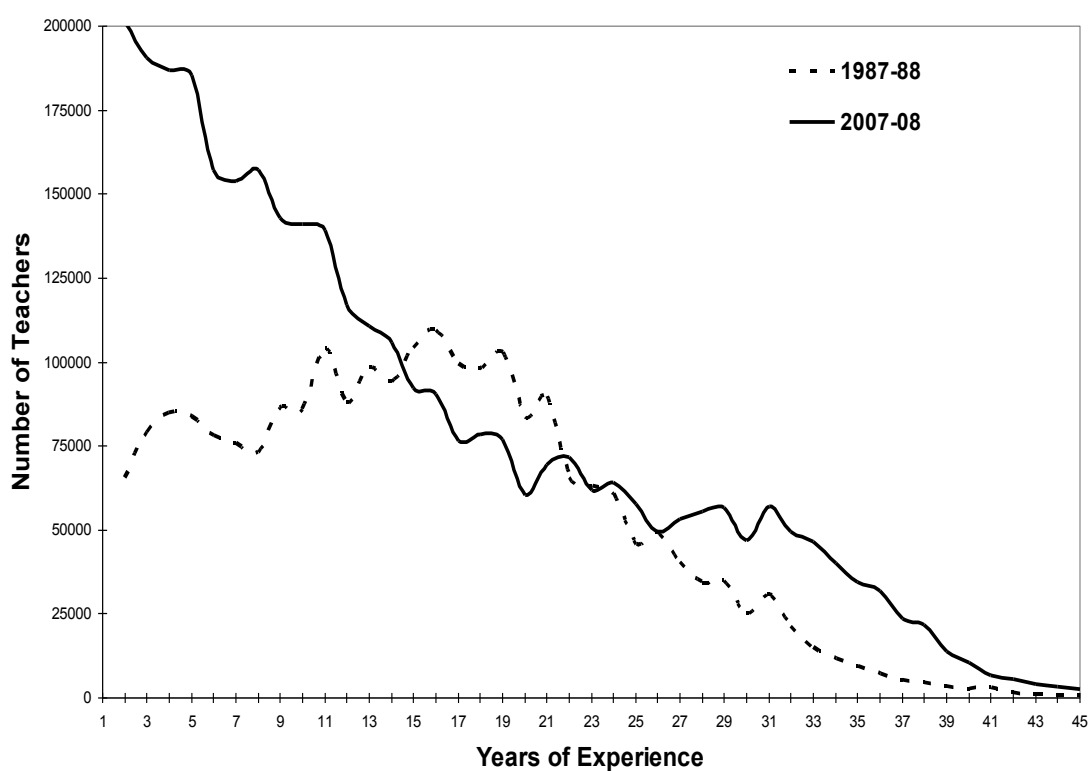


Trend 3: Greening

Graying is not the only change in the age and experience of the teaching force. Another opposite and unrecognized trend has occurred simultaneously. As Figure 3 shows, by 2008, the

teacher age distribution had become bi-modal, with two peaks. As the proportion of older veteran teachers has increased, so has the proportion of beginning teachers. The increase in beginning teachers is largely driven by the ballooning trend, that is, by the huge increase in new hires.

Figure 4: Teaching Experience of Public School Teachers, 1987-88 and 2007-08



Most of these new hires are young, recent college graduates, but a significant number are older but inexperienced beginning teachers. For instance, in 2007-08 over a third of the new hires were age 29 or older, almost a fifth were over 40 – the phenomenon often referred to as mid-career switching. Parallel to the general ballooning, since the late 1980s there has also been an increase in the number of older new hires. But, mid-career switching into teaching is neither new, nor an upward trend. Indeed despite such recruitment programs as Troops to Teachers, the proportion of new hires that were age 29 or older decreased from 43 percent in the late 1980s to 35 percent in 2007-08.

Regardless of their age, these many new hires have resulted in a third trend—a dramatic increase in the portion of teachers who are beginners, or a greening of the teaching force. This trend is illustrated by the distribution of teachers by their years of teaching experience. In 1987-88, the modal teacher had 15 years of teaching experience under her belt, and the shape of the distribution was a single peak, as Figure 4 shows. But by 2007-08, as Figure 4 also shows, the modal teacher was not a gray-haired veteran; she was a beginner in her first year of teaching. In 1987-88, about 17 percent of the teaching force had five or fewer years of teaching experience; in 2007-08, about 28 percent of the teaching force was inexperienced. But these percentages don't take into account the ballooning of the teaching force. Since the teaching force has dramatically grown, *numerically* there are far more beginners than before. In 1987-88, there were about 65,000 first-year teachers; by 2007-08, there were over 200,000.

What are the implications of this trend?

New teachers can be a source of fresh ideas and energy, and it can be beneficial to have new faculty coming into schools. On the other hand, having an increasingly larger number of beginners, along with an increasingly smaller number of veterans in a school could also have a negative impact. Being taught by more experienced teachers, for example, can make a positive difference for students' academic achievement. A growing number of empirical studies document what is common sense among those who have taught—that teachers' effectiveness at improving their students' test scores increases significantly through their first several years on the job (e.g., Kane, Rockoff, & Staiger, 2006; Henry, Fortner & Bastian, 2012). Beyond academic instruction, as they get more experience teachers also have more opportunity to develop many other attributes crucial to the teaching job, such as how to deal with students' behavior problems, how to teach students with diverse backgrounds and abilities, how to best work and communicate with parents, how to best promote good work habits in students, and how to nurture students' self-esteem.

Having sufficient numbers of veteran teachers in a school can also make a positive difference for beginning teachers. A solid body of empirical research documents that support and mentoring by veteran teachers has a positive effect on beginning teachers' quality of instruction, retention, and capacity to improve their students' academic achievement (Ingersoll & Strong, 2011).

Greening also has financial implications. A teaching force with an increasingly larger portion of beginners, at the low end of the pay scale, is less expensive, and this could ameliorate some of the increased payroll costs of the ballooning trend mentioned above. In 2007-08, the average starting salary for public school teachers with a college degree and no teaching experience was about \$35,500; while that same year the average highest possible salary for veteran public school teachers, usually with over 10 years experience and a masters degree, was about \$62,000. In addition, a greener teaching force means that more employees are contributing to pension systems, and this in turn may defray some of the increased pension costs resulting from the graying trend. Economic analysts have been arguing that there has been an alarming decrease in the ratio of new employees who pay into pension systems and Social Security, compared to retired employees who withdraw from pension systems and Social Security. This imbalance does not appear to be the case for teaching, which is the largest occupational group in

the nation. As figures 3 and 4 illustrate, both the proportion and the numbers of younger and less experienced teachers have increased, not decreased. Moreover, as we will show in Trend 7, early attrition has increased among this growing number of beginners, perhaps meaning that a decreasing number will ever be eligible to withdraw funds (especially those funds contributed by their employers or states) from state pension systems.

Trend 4: Becoming More Female

The teaching force has gotten more female. At first, this finding may seem odd. Over the past several decades, many occupations and professions that were traditionally predominantly male have opened up to women. For instance, data from the Bureau of Labor Statistics (2011) show that in 1972, only 10 percent of physicians, 4 percent of lawyers, 4 percent of architects and 13 percent of pharmacists were female; by 2010, these proportions had risen to 32 percent, 32 percent, 13 percent, and 53 percent, respectively.

With career and employment alternatives increasingly available, you might think that fewer women would enter occupations and professions that have been traditionally predominantly female. But this has not happened for teaching. Both the number of women entering teaching and the proportion of teachers who are female have gone up. The SASS data, along with other NCES data, show that since the early 1980s there has been a steady increase in the proportion of teachers who are female, from 66 percent in 1980 to 76 percent in 2007-08. (see Figure 5). It is unclear why this has happened.

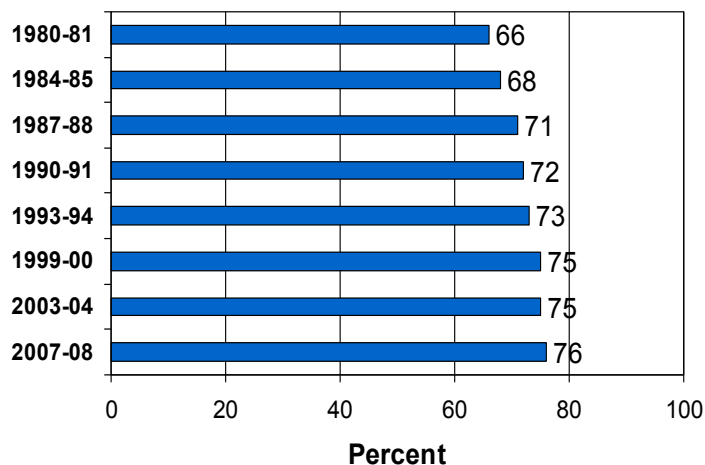
The change in the male-to-female ratio in teaching is not due to a decline in males entering the occupation. The number of males entering teaching has also grown, by 26 percent, which is also faster than the rate of increase of the student population. But the number of females in teaching has increased at over twice that rate.

One reason could be a variant of the above hypothesis—females have other employment opportunities in general, but also growing opportunities in the educational sector. The increase in female teachers is not spread evenly within schools. Increases in the proportion of female teachers have been concentrated at the secondary level, where the majority of teachers were male until the late 1970s. There have been only slight increases at the elementary level, already long predominantly female. There have been even sharper increases in the proportion of female school principals (see Figure 6), over half of whom are now female. The latter sub-trend, especially, could be a factor in not only the recruitment but also the retention of females, including those of high academic ability—an issue we will turn to in Trend 6. Historians (e.g., Tyack, 1974; Strober & Tyack, 1980) have long held that when the public school system was created in the late 1800s, teaching was designed to be a female-dominated occupation, while educational administration was designed to be a male-dominated occupation. Part of the rationale was that the recruitment and retention of capable males required a career ladder with opportunities for advancement and enhancement in status, pay, and authority. Hence the opening up of educational administration to women—demonstrated by the rapid growth in the numbers of female principals shown in Figure 6—could be one possible explanation for the continuing

attraction of teaching and education careers for women, despite the growth of other employment opportunities.

Another contributing factor might be that the proportion of adult women entering the paid workforce as a whole has dramatically increased. Hence, while women have more job choices than in the past, the large increase overall in women seeking employment may be partly responsible for the large increase in females entering teaching.

Figure 5: Percent Female Public School Teachers, 1980-81 to 2007-08



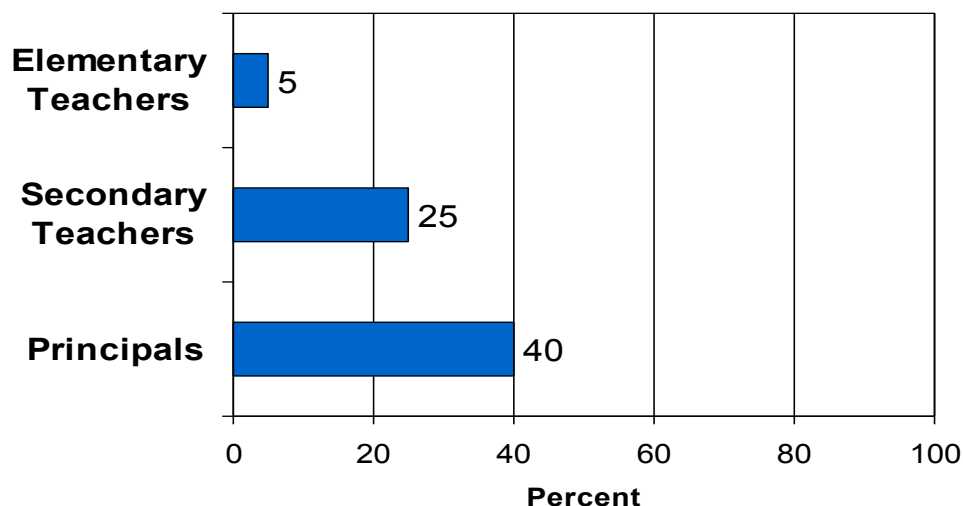
Yet another factor might have to do with negotiating the dual roles of homemaker and breadwinner—the fit between job and family. Historians argue that one factor behind the high proportion of women in teaching over the past century was the relatively workable fit between the job of teaching and the job of child rearing (Strober & Tyack, 1980). From this viewpoint, with shortened days and summers off, caring for a family was more manageable for teachers than for women in many other jobs and careers. This workday structure may still be attracting women to teaching.

What are the implications of this trend?

If the trend continues, very soon eight of 10 teachers in the nation will be female. An increasing percentage of elementary schools will have no male teachers. An increasing number of students may encounter few, if any, male teachers during their time in either elementary or secondary school. Given the importance of teachers as role models, and as surrogate parents, certainly some will see this trend as a problem and a policy concern.

Moreover, feminization may have implications for the stature and status of teaching as an occupation. Traditionally, women's work has been held in lower esteem and has paid less than male-dominated work. If the feminization of teaching continues, what will it mean for the way this line of work is valued and rewarded?

Figure 6: Percent Increase of Female Teachers and Principals, from 1987-88 to 2007-08

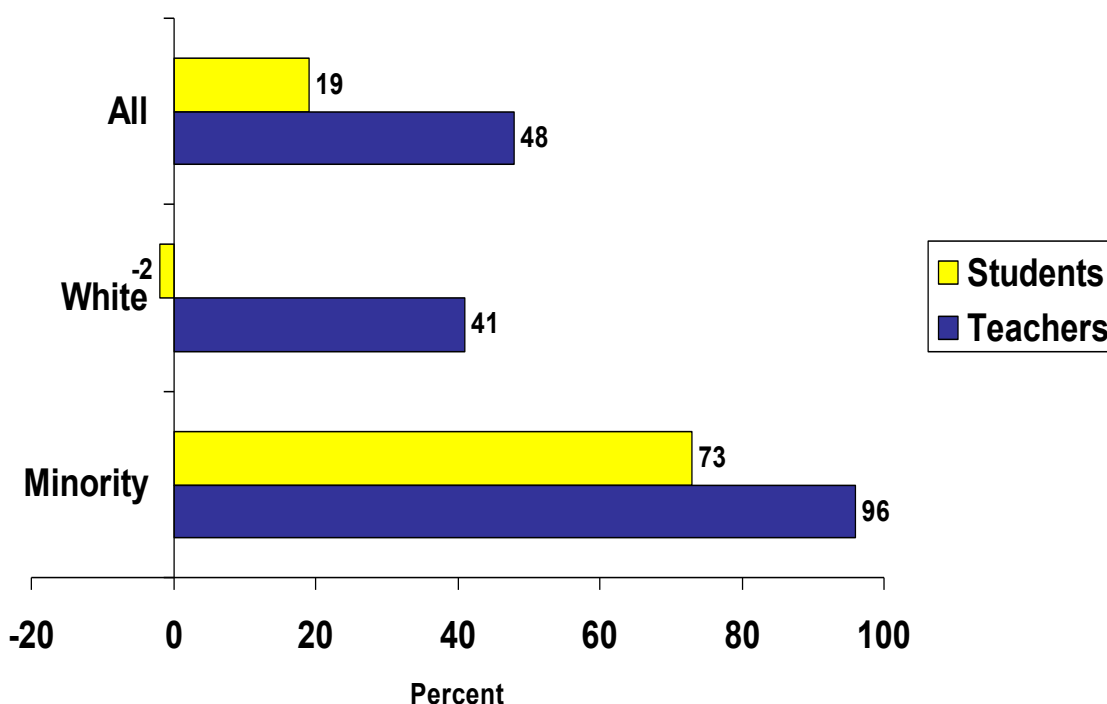


Trend 5: Diversifying

While the teaching force is becoming more homogenous gender-wise, the opposite is true for the race/ethnicity of teachers. At first this finding may also seem odd. For several decades, shortages of minority teachers have been a major issue for the U.S school system. It is widely held that, as the nation's population and students have grown more diverse, the teaching force has not kept pace (for reviews, see Torres et al., 2004; Villegas & Lucas, 2004; Zumwalt & Craig, 2005). The result, in this view, is that minority students in the nation's schools increasingly lack minority adult role models, contact with teachers who understand their racial and cultural background, and often qualified teachers of any background, because white teachers eschew schools with large percentages of minorities (Irvine, 1988; Ladson-Billings, 1995). The minority teacher shortage, in turn, is widely viewed as a key reason for the minority achievement gap and, ultimately, unequal occupational and life outcomes for minority students. In response, in recent decades numerous government and nongovernment organizations have instituted and funded a variety of minority teacher recruitment programs and initiatives.

But this portrait is changing. Our analyses do show that teaching remains a primarily white workforce and that a gap continues to persist between the percentage of minority students and the percentage of minority teachers in the U.S. school system. This gap has persisted in spite of large increases in new minority teachers because the student population also experienced increases in the number of minority children, while the number of white students has decreased. Indeed, over the past two decades, the number of minority teachers has almost doubled, from about 325,000 to 642,000. Growth in the number of minority teachers outpaced growth in minority students and was over twice the growth rate of white teachers (see Figure 7). So, although the proportion of minority students in schools is still greater than the proportion of minority teachers, the teaching force has rapidly grown more diverse (Ingersoll & May, 2011a, 2011b).

Figure 7: Percent Increase in Students and Teachers, by Race/ethnicity, from 1987-88 to 2007-08



Minority teachers are also overwhelmingly employed in public schools serving high-poverty, high-minority and urban communities. Our data show that minority teachers are two to three times more likely than white teachers to work in such hard-to-staff schools. Hence, the data show that in spite of competition from other occupations for minority college graduates, the widespread efforts over recent decades to recruit more minority teachers and place them in schools serving disadvantaged and minority student populations have been very successful.

However, while minorities have entered teaching at higher rates than whites in recent decades, the data also show that the rates at which minority teachers depart from schools is significantly higher than that of white teachers, and has also been increasing. In the two decades from the late 1980s to 2009, the annual rate of minority teacher turnover increased by 28 percent, undermining minority teacher recruitment efforts. Indeed, the diversification of the teaching force is all the more remarkable because it has occurred in spite of the high turnover rate among minority teachers. We will return to the issue of minority teacher turnover in Trend 7.

Trend 6: Not Declining in Academic Ability

It is widely believed that the “best and brightest” college students find elementary and secondary teaching less attractive than other career and job options. Over the years, data from different sources have seemed to bear this out. For instance, based on the assumption that academic ability is accurately captured by standardized tests, a number of analyses have shown SAT or ACT scores of college graduates going into teaching have long been well below the average for college graduates. In our own analyses of national data from NCES’ Baccalaureate and Beyond Survey for the undergraduate college class of 1999-2000, we found that this is especially true for those majoring in Education, who tended to have among the lowest average SAT scores. Moreover, within most fields and majors, we found that those who became teachers had lower SAT scores than those in the same field/major who did not go into teaching.

Not only do teachers tend to have below-average academic test scores, some researchers and commentators have held that the academic ability of teachers has been declining over time—and that gender is at the root of the issue. While the number of women going into teaching has increased, as discussed in Trend 4, proponents of this view have argued that the academic quality of women who choose to go into teaching has gone down. With alternative careers and jobs increasingly available, this view holds that the “best and brightest” women have decreasingly entered traditionally female-dominated occupations and professions, such as teaching. Indeed, some have concluded that women essentially subsidized the education system for most of the previous century because they were relatively high-ability employees working for relatively low wages. But, this argument continues, this subsidy has stopped, and as a result, the academic caliber of the female portion of the teaching force has declined in recent years.

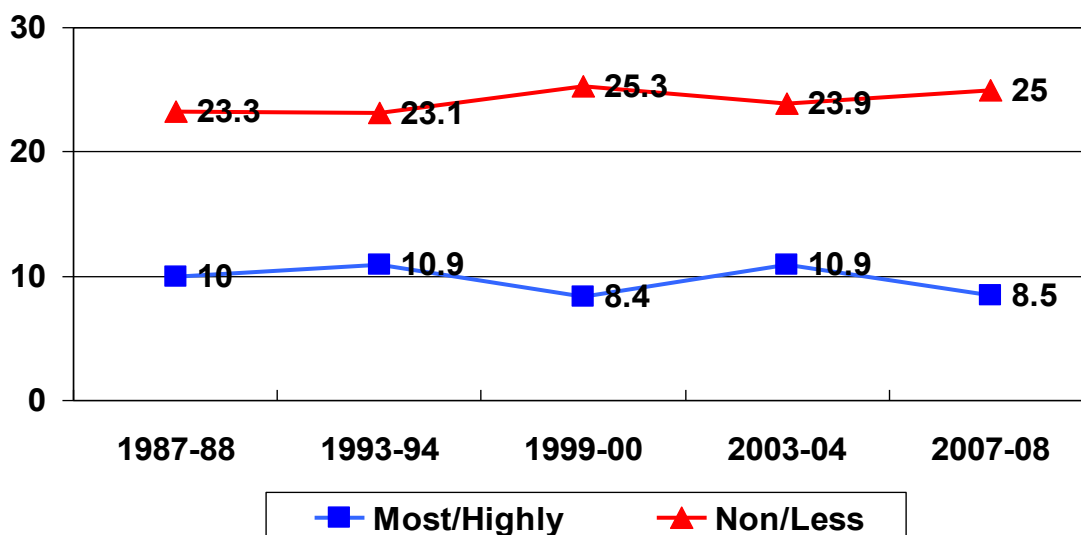
In the data, however, support for this proposition appears to be mixed. One study looking at trends in female standardized test scores from the 1960s to 2000 found a decline in the proportion of female teachers who scored in the high deciles (Corcoran et al., 2004). But another study with data from the Educational Testing Service (ETS) showed no decline in SAT scores of teachers as a whole from the mid 1990s to the mid-2000s (Gitomer, 2007).

Of course, we cannot assume that either the “best and brightest,” or those scoring higher on standardized tests, are the best or the most effective teachers. How to measure either academic ability or teaching quality is a subject of controversy. Moreover, the relationship between teachers’ academic ability and their teaching quality is unclear. But academic ability is often

assumed to be an important indicator of the caliber of employees in any line of work, and of the attractiveness of an occupation or profession.

We examined these trends using another possible measure of academic ability—the selectivity or competitiveness of one’s undergraduate institution, which is no doubt correlated with SAT/ACT and other standardized test scores. The measure we used is *Barrons’* six-category ranking of colleges and universities: most competitive; highly competitive; very competitive; competitive; less competitive; not competitive. In 2007-08 the top two categories accounted for 14 percent of institutions and 21 percent of undergraduates. The bottom two categories accounted for 19 percent of institutions and 13 percent of undergraduates.

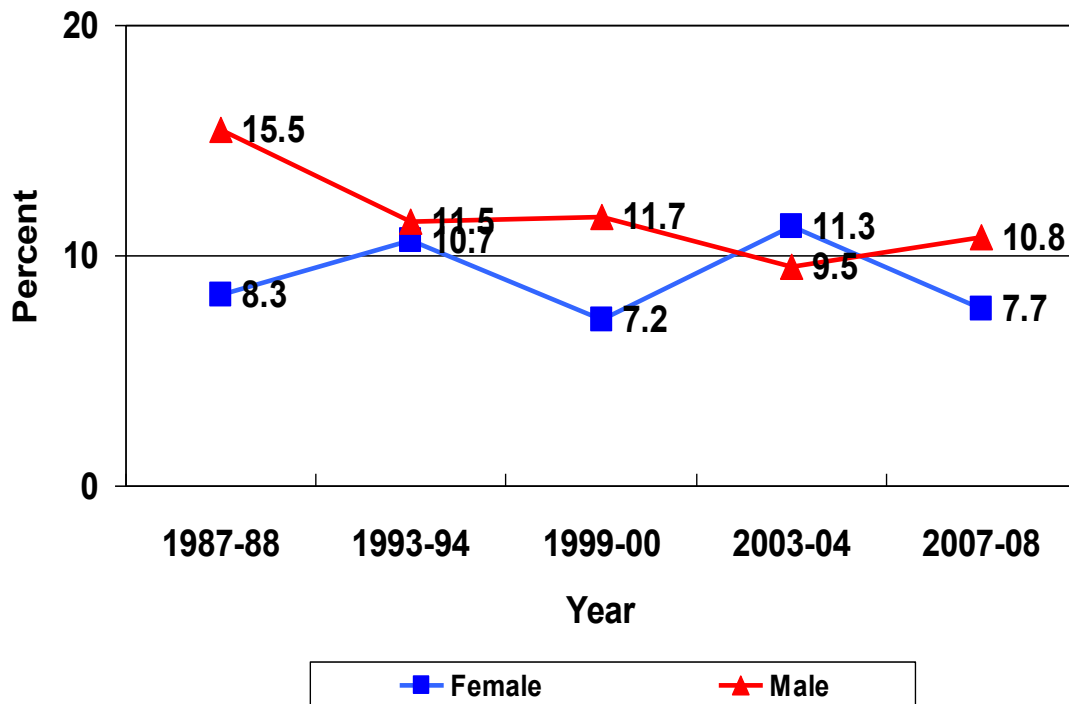
Figure 8: Percent 1st-Year Teachers, by Selectivity of Their Undergraduate College/University, 1987-88 to 2007-08



What did we find?

About a tenth of newly hired first-year teachers come from the top two categories of higher education institutions. About a quarter come from the bottom two categories. Two thirds of first-year teachers came from middle-level institutions. This has changed little in recent decades. From 1988 to 2008, there was a slight decrease in the proportion from the top two categories, a slight increase in those from the bottom two categories, and no change in the proportion from the middle categories (see Figure 8). But over these two decades, these proportions have tended to fluctuate both up and down, and it is not possible to conclude that there is a trend either way.

Figure 9: Percent 1st-Year Teachers, with Undergraduate Degrees from Most and Highly Selective Colleges and Universities, by Gender, 1987-88 to 2007-08



There are, however, important differences by gender.

Interestingly, male teachers have been more likely to come from top-ranked institutions than have female teachers, but decreasingly so in recent years. Between 1987-88 and 2007-08, there was a significant decrease in the proportion of first-year male teachers from the top two ranks of institutions – from 15.5 percent to 10.2 percent. Nevertheless, a larger proportion of male teachers than of female teachers still come from top institutions. The data also show that far more male teachers come from the two bottom categories of institutions than from the two top categories. There was a slight increase in the proportion of newly hired male teachers coming from the two bottom ranks of institutions—from 24.3 to 25.1 percent—between 1987 and 2008 .

For female first-year teachers, the proportion who come from the two top categories of institutions has fluctuated from year to year. But overall, there was little change for the 20-year period from 1987-88 to 2007-08—a drop of less than 1 percent, from 8.3 percent to 7.7 percent. The data also show that two to three times as many female teachers come from the two bottom categories of institutions, and this also has shown little change in over the past 20 years, going from 23 to 24 percent.

However, these percentages do not tell the whole story. Although the *percentage* of female teachers from top institutions has not changed much since the late 1980s, because the teaching force has ballooned (Trend 1) and has also become more female (Trend 4), *numerically* teaching has been employing far more female candidates from all of higher education, including top colleges and universities. For instance, from 1988 to 2008 there has been a 59 percent increase in the number of first-year female teachers from the top two ranks of institutions. Moreover, there was 29 percent increase in the number of first-year male teachers from top schools.

Because it is such a large occupation, a very large portion of college graduates go into teaching. For instance, of the college class of 1999, almost one-fifth became teachers after graduation. But it does not appear that teachings' share of college grads, whether from top, middle, or bottom ranked institutions, has increased during this period, simply because the number of graduates of four-year colleges and universities has also simultaneously gone up, by 57 percent.

Hence, assuming our college selectivity measure of academic ability is valid, our data show that there has been a decrease in the proportion of male teachers from top institutions since the late 1980s. But these data also show this trend has *not* been true of female teachers. Perhaps we should call the latter a non-trend. And, in sheer numbers, teaching is getting far more of both males and females from top institutions than before. So, contrary to the view that there has been a decline in the academic caliber of female teachers, our data suggest this has not been true in recent decades.

Along with the increase in the numbers and proportions of female teachers, we do not know the reasons for the apparent stability, or even improvement, in the academic ability of females entering teaching in recent decades. As we suggested in Trend 4, perhaps the increase in opportunities for women in school leadership and positions in secondary schools (see Figure 6) have been attractive incentives for able and ambitious females to enter education.

Trend 7: Destabilizing

Elementary and secondary teaching has long been marked by relatively high rates of annual turnover—the departures of teachers from schools (Lortie, 1975; Tyack, 1974). These departures include both migration (teachers who move between districts and schools) and attrition (those who leave teaching altogether). Analyzing national data, we found that, as one might expect, teaching does have less turnover than some occupations, such as child care workers, secretaries, and paralegals; teacher turnover is similar to that of police officers; and teaching has higher turnover, perhaps surprisingly, than nursing, and far higher turnover than traditionally highly respected professions, such as law, engineering, architecture and academia (Ingersoll & Perda, 2012).

Moreover, the data show that the teaching force has slowly but steadily become less stable in recent years. This increased instability is especially true for the case of attrition,

meaning those leaving teaching altogether. For instance, from 1988 to 2008, annual attrition from the teaching force rose by 41 percent, from 6.4 percent to 9 percent.

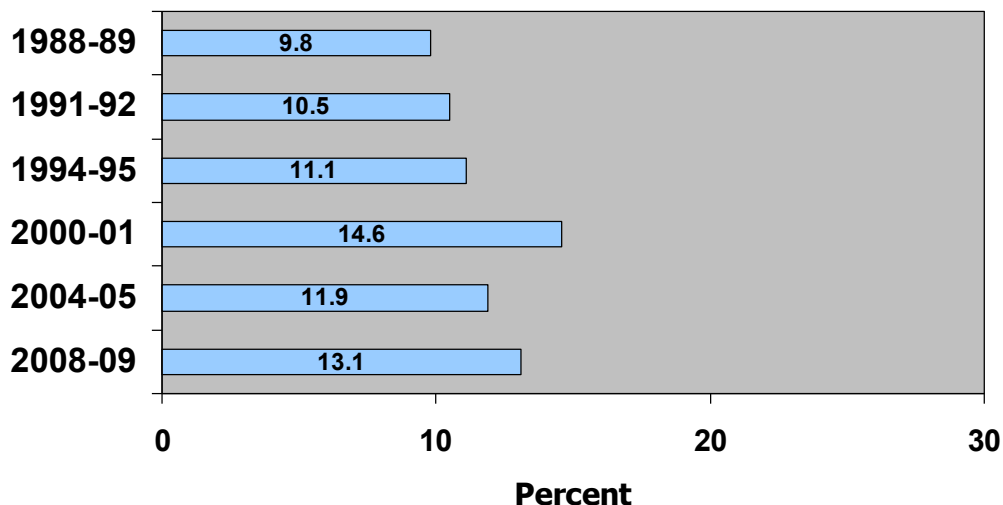
But these overall figures mask large differences in turnover among different types of teachers and different locales, revealing the need to disaggregate our data. The flow of teachers out of schools is not equally distributed across states, regions and school districts. The largest variations in teacher turnover by location, however, are those between different schools, even within the same district. The data show that in 2004-05, 45 percent of all public school teacher turnover took place in just one quarter of the population of public schools. The data show that high-poverty, high-minority, urban, and rural public schools have among the highest rates of turnover. Not only were the rates higher in these kinds of schools, but when teachers left these schools for other schools, they headed to schools that were not in these categories. The data show an annual asymmetric reshuffling of significant numbers of employed teachers from poor to not poor schools, from high-minority to low-minority schools, and from urban to suburban schools.

The data also show that rates of both moving and leaving differ by the race/ethnicity of the teacher. As mentioned earlier in Trend 5, over the past couple of decades, minority teachers have had significantly higher rates of turnover than white teachers. Moreover, the gap has widened in recent years. Why is this? Strikingly, while the demographic characteristics of schools appear to be highly important to minority teachers' initial decisions as to where to teach, this doesn't appear to be the case for their later decisions about whether to stay or depart. What does impact their decisions, our analyses show, are school working conditions, in particular the degree of autonomy and discretion teachers are allowed over issues that arise in their classrooms, and the level of collective faculty influence over school-wide decisions that affect teachers' jobs. The same difficult-to-staff schools that are more likely to employ minority teachers are also more likely to offer less-than-desirable working conditions, according to our data, and these conditions account for the higher rates of minority teacher turnover. These high levels of turnover, of course, undermine efforts to diversify the teaching force (Ingersoll & May, 2011a, 2011b).

However, the group of teachers, regardless of race, with the highest rates of turnover are beginners. Between 40 to 50 percent of those who enter teaching leave teaching within five years (Ingersoll & Perda 2012). And these already high levels have been going up since the late 1980s. Rates of leaving for first-year teachers rose from 9.8 to 13.1 percent from 1988 to 2008—a 34 percent increase (Figure 10). Again, however, an increase in the annual percentage does not tell the whole story. Since the teaching force has grown dramatically larger, *numerically* there are far more beginners than before (Trend 3), and hence the actual numbers of teachers who quit the occupation after their first year on the job has also soared. After the 1987-88 year, about 6,000 first-year teachers left teaching, while after the 2007-08 year, more than four times as many – about 26,000 – left the occupation. Not only are there far more beginners in the teaching force, but these beginners are less likely to stay in teaching.

In short, members of the largest group within the largest occupation in the nation have been leaving at relatively high rates, and these rates have steadily increased in recent decades. Together, ballooning and turnover indicate a growing flux and instability in the teaching occupation, as both the number of those entering teaching and the number of those leaving teaching have been increasing in recent years.

Figure 10: Percent Annual 1st-Year Teacher Attrition, 1988-89 to 2008-09



These changes have large implications. Employee turnover in any occupation, such as teaching, has pros and cons, costs and benefits. On the one hand, some degree of employee turnover, with the accompanying job and career changes, is normal, inevitable, and can be efficacious for individuals, for organizations, and for the economic system as a whole. Too little turnover of employees is tied to stagnancy in organizations; effective organizations usually both promote and benefit from a limited degree of turnover by eliminating low-caliber performers and bringing in “new blood” to promote innovation.

On the other hand, high levels of employee departures are worrisome not only because they can be a symptom of underlying problems in how well organizations function, but also because departures can entail costs and other negative consequences for organizations and for the larger system (Ingersoll & Perda, 2012).

As mentioned earlier, we have found that one negative consequence of teacher turnover is its important but often overlooked role in teacher shortages (Ingersoll & Perda 2010). Increases in turnover only exacerbate the problems that many schools have staffing their classrooms with qualified math and science teachers. Increases in turnover among minority teachers, especially in disadvantaged schools, undermine efforts to recruit new teachers in hard-to-staff schools and to diversify the teaching force.

Another negative consequence of high levels of beginning teacher attrition is the loss of newcomers before they are able to fully develop their skills. As mentioned earlier, a number of studies have documented the reasonable proposition that teachers' effectiveness—as measured by gains in their students' test scores—increases significantly with additional experience for the first several years in teaching (e.g., Kane, Rockoff, & Staiger, 2006; Henry, Fortner & Bastian, 2012).

Conclusion

Has the elementary and secondary teaching force changed in recent years? The answer is most certainly yes—and in a number of ways. It has become far larger. It has simultaneously become both older and younger and far less experienced. It has simultaneously become less diverse, by gender, and more diverse, by race-ethnicity. It does not appear to be suffering from a decline in the academic ability of females entering teaching; indeed, the numbers of new teacher hires coming from the top-ranked colleges and universities has increased. It has become less stable.

For each of these trends, or non-trends, large questions immediately arise. What are the reasons for, and sources of, the trend? Will the trend continue, and what impact will it have? Given the economic downturn of the past few years, we are especially interested to analyze the next cycle of the data (slated to be released in 2013) to learn which of these trends have continued beyond 2008—the most recent year for which data are available. It is also striking that while these trends raise important questions, we have seen little awareness or discussion of them—whether by researchers, by policy makers, by educators, or by the public. But there are good reasons to investigate the sources and continuation of these changes—because if these trends do indeed continue, there will be large consequences, with serious financial, structural, and educational implications for America's educational system.

For instance, has the teaching force continued to outgrow the student population it serves, and, if so, why? If the teaching force does continue to balloon in size, the expense to local school districts could become unsustainable, and without an increase in funds, districts may increasingly turn to cutting teacher salary levels.

Will the hiring and thus greening trend continue? In turn, will an increasing number of new hires decide to not stay in teaching, making teaching increasingly an occupation practiced by the young and inexperienced, and if so, why? If so, the expense to local school districts could become more sustainable, because of lower overall average salary costs per employee. In other words, will there effectively be a financial tradeoff between the numbers of teachers and their experience? On the other hand, as the older portion of the teaching force finishes retiring, will a large portion of the newcomers decide to stay with teaching to become the next generation of veterans?

Has the teaching force continued to become more female, and if so, why? If the teaching force does continue to become even more female dominated, with the presence of male role

models a rarity for an increasing number of students in their K-12 school years, will there be negative implications for students?

Perhaps there is an irony in these changes. Historians tell us that when the public school system as we know it today was invented a century ago, the teaching force was transformed into a large mass occupation that was a relatively low-paying, temporary line of work, predominantly for young, inexperienced women, prior to their “real” career of child rearing. (e.g., Tyack, 1974; Lortie, 1975). Perhaps the changes we have traced represent not an entirely new face but a return to the old face of the American teaching force.

A return to an old face could have serious implications for the future stature, standing and status of elementary and secondary teaching in the US. Professionalization has long been a source of both hope and frustration for teachers. Since early in the 20th century, educators have repeatedly sought to upend the notion that teaching is akin to industrial work where teachers are interchangeable and easily replaced, and they have sought to promote the view that teaching is highly complex work, requiring specialized knowledge and skills and deserving of the same status, stature and standing as traditional professions, like law, medicine, engineering and academia. These efforts to enhance the professional status and stature of teaching have also long met with limited success. And if teaching becomes an even larger, lower-paying line of work, predominantly employing young, inexperienced women, who stay for limited periods, these trends do not suggest optimism for these aspirations.

At the same time, these possible future trajectories, and similarities between the contemporary transformation of the teaching force and its previous incarnation, are strictly speculative on our part. Nothing in our data analyses thus far can be considered conclusive evidence that the teaching force is, or will be, becoming “better” or “worse” in one way or another. As we indicated at the beginning of this paper, thus far our objective has been exploratory and suggestive. At this point we have more questions than answers. What is clear is that large-scale changes are happening to the nation’s largest occupational group. Right after World War II and before the post-war baby boom, there were just over $\frac{3}{4}$ million elementary and secondary teachers in the US. By 2007-08, there were over five times as many—about 4 million elementary and secondary teachers. In the 2007-08 school year alone, over 200,000 newcomers entered teaching. These data suggest a very large opportunity—the largest occupation in the nation is being expanded, replaced, and re-made. Who will they be? We plan to undertake further research to answer this question.

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