

## The Single Salary Schedule and Other Issues of Teacher Pay

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*Eric A. Hanushek*

*Hoover Institution, Stanford University*

The importance of teacher quality for determining student outcomes is now well established. At the same time, the translation of what is known about teacher quality into effective policy is far from being institutionalized. The simplest summary of research into teacher quality is that some teachers are dramatically more effective than others but that common measures of quality are largely uncorrelated with true quality. Thus, for example, we continue to face problems of insufficient numbers of high-quality teachers, or shortages of math and science teachers, and of "out of field" teachers. Many argue that we should tightened up on entry requirements along with increasing overall pay, but these policies are unlikely to deal with the current problems. Instead, we are likely to be much better off by loosening up entry requirements, by paying more attention to retention decisions, and by rewarding the people we want—those who are effective and who meet current areas of need.

The economic well-being of the nation is directly related to the skills of the population.<sup>1</sup> It is becoming broadly recognized that quality teachers are the key ingredient to a successful school and to improved student achievement. Yet standard policies do not ensure that quality teachers are recruited and retained in the profession. Finding solutions to this problem is particularly important given the rate of expected retirements and, commensurately, the huge numbers of new teachers who must be hired over

Correspondence should be sent to Eric A. Hanushek, Hoover Institution, Stanford University, Serra and Galvez 318, Stanford, CA 94305-6010. E-mail: hanushek@stanford.edu

<sup>1</sup>For calculations of the benefits of improved student achievement, see Hanushek (2005).

the next decade. Although there are some signs of change, the majority of the country is stuck with a compensation system that works against improvements in the teaching force. Without some significant changes, the hope of systematically improving student outcomes is small.

Of course, the teacher compensation system works within the entire set of policies that govern teachers including recruitment, certification, tenure, and retirement. Things done in those areas interact with the compensation system and determine the outcome of who is in the classroom and how much students learn.

Any coherent set of policy prescriptions aimed at improving the quality of the teachers in our classrooms must have multiple dimensions. An induction policy is obviously crucial. But an induction policy must be coordinated with policies that manage teachers and reward them according to their performance once they have been inducted.

### The Evidence on Teacher Quality

A natural starting point of the discussion is a description of what makes a good teacher. Much of the discussion of teacher quality is populated by widely held views on the characteristics that are needed—deep subject-matter knowledge, love of children, knowledge of child psychology, pedagogical training, and the like. This list shares two common elements. The items intuitively make sense and seem reasonable, and there is virtually no evidence that links these strongly to student achievement and performance in the classroom.

The evidence actually goes deeper than that. Although some of the prior characteristics enter into school policy through requirements for teacher certification, other characteristics directly determine teacher compensation—namely, teacher experience and teacher education levels. Indeed, these characteristics have been subjected to extensive research that delves into the determinants of student achievement.

The evidence on the “pay parameters” comes largely from extensive statistical analyses of how characteristics of teachers affect student outcomes. This evidence quite clearly suggests that the common measures of quality—overall experience and graduate education—bear little consistent relationship to student performance (Hanushek, 2003).<sup>2</sup>

<sup>2</sup>As discussed next, however, the first year or two of experience does seem to have important impacts on student achievement; see, for example, Boyd, Grossman, Lankford, Loeb & Wyckoff (2006); Hanushek, Kain, O'Brien, & Rivkin (2005); Kane, Rockoff, & Staiger (2006); Rivkin, Hanushek, & Kain (2005); and Rockoff (2004).

Other studies have investigated more specific characteristics of teachers, and one commonly discussed measure is teacher test scores, which are generally viewed as indicating the cognitive ability of the teacher. Yet even though this measure comes closer to being a consistent determinant, less than half of the actual statistical investigations have pointed to it with any degree of confidence (i.e., less than half have been statistically significant); see Hanushek (2003).

These general findings are nonetheless frequently misunderstood. They do not imply that teachers are unimportant. They simply indicate that the measured attributes of teachers and their training are not good predictors of classroom performance.

Teachers prove to be very important. An alternative approach to the examination of teacher quality goes beyond trying to characterize individual teacher attributes that are important. Instead, it concentrates on pure outcome-based measures of teacher effectiveness. The general idea is to investigate "total teacher effects" by looking at differences in growth rates of student achievement across teachers. A good teacher would be one who consistently obtained high learning growth from students, whereas a poor teacher would be one who consistently produced low learning growth.<sup>3</sup>

The magnitude of estimated differences in teacher quality is impressive. Hanushek (1992) showed that teachers near the top of the quality distribution can get an entire year's worth of additional learning out of their students compared to those near the bottom.<sup>4</sup> That is, a good teacher will get a gain of 1.5 grade level equivalents whereas a bad teacher will get 0.5 year for a single academic year.

A second set of estimates comes from recent work on students in Texas (Rivkin, Hanushek, & Kain, 2005). The analysis follows several entire cohorts of students and permits multiple observations of different classes with a given teacher. We look at just the variations in performance from differences in teacher quality within a typical school because of the difficulties involved in separating differences in teacher quality from other factors that differ among schools. The variation in teacher quality is large: Moving from an average teacher to one at the 85th percentile of teacher quality (i.e., moving up 1 standard deviation in teacher quality) implies that the

<sup>3</sup>A variety of studies have pursued this general approach over the past 3 decades; see Armor et al. (1976); Boyd et al. (2005); Boyd, Grossman, Lankford, Loeb, & Wyckoff (2006); Hanushek (1971, 1992); Hanushek et al. (2005); Kane et al. (2006); Murnane (1975); Murnane & Phillips (1981b); Rivkin et al. (2005); Rockoff (2004).

<sup>4</sup>These estimates consider value-added models with family and parental models. The sample includes only low-income minority students, whose average achievement in primary school is below the national average. The comparisons given compare teachers at the 5th percentile with those at the 95th percentile.

teacher's students would move up more than four percentile rankings in the given year. This is roughly equivalent to the effects of a 10-student (roughly 50%) decrease in class size. For a variety of reasons, these are lower bounds estimates of variations in teacher quality. Any variations in quality across schools would add to this. Moreover, the estimates rely on a series of conservative assumptions which all tend to lead to understatement of the systematic teacher differences.

### Traditional Approaches to Teacher Recruitment and Retention

Teachers provide the frontline delivery of education to the student, and the previous section demonstrates their importance. Nonetheless, virtually all of the traditional actions taken in the policy arena fail to work in the direction of improving teacher quality. Indeed, many operate to restrict entry of potentially good teachers and to retain the wrong group of teachers.

*Recruitment.* As many have noted, existing restrictions to entrance into the teaching profession do not necessarily improve the quality of teachers. A large number of studies have found that the certification status of a teacher is seldom related to the academic gains made by his or her students.<sup>5</sup> Also, the common national practice of requiring that teachers be certified is particularly damaging for states that must hire an especially large number of teachers, because it reduces the pool of potential teachers.

Two distinctly different types of policies aimed at improving the quality of the teachers recruited have been proposed as solutions.<sup>6</sup> The first type, and perhaps the dominant in the national debate, proposes to tighten up on who can become a teacher by requesting specific formal schooling requirements. These requirements frequently include an undergraduate major in a disciplinary field, a master's degree that provides pedagogy, psychology, and maybe field experience, and possibly higher entry test scores to enter teacher training programs, elevated minimum grade point averages, and the like.

<sup>5</sup>For a clear discussion of the overall issues, see Ballou and Podgursky (1997). Some of the evidence on certification is actually quite controversial. Elements of the debate and controversy over the effectiveness of teacher credentialing can be traced through Abell Foundation (2001); Darling-Hammond, Berry, and Thoreson (2001); Goldhaber and Brewer (2000, 2001); National Commission on Teaching and America's Future (1996); and Walsh (2002).

<sup>6</sup>For a more detailed discussion of the various positions plus the relevant bibliography, see Hanushek and Rivkin (2004). See also Gordon, Kane, and Staiger (2006).

People advocating this position frequently understand that such a program would be more difficult and more costly to prospective teachers than the current certification requirement. As a result of the increased teacher preparation standards, overall salaries would be raised, in part in recognition of the additional credentials and in part to offset any reductions in the supply of potential teachers. An increase of the teachers' salary across the board is also frequently viewed as a benefit in itself. Paying teachers a salary more in line with, say, that of accountants, lawyers, and other professionals would increase the level of status and respectability of the teaching profession and ultimately would make recruitment easier.

The other type of policies proposed to improve quality of the teachers recruited involves loosening up rather than tightening up the requirements. These policies move in the direction of more entry paths into the profession. In other words, they would allow people to come into teaching by routes other than the traditional education school preparation.

This second position is generally silent about the level of salaries. Because this approach would remove some of the current entry-level restrictions into teaching, the supply of applicants would increase. It is difficult to know, however, how responsive the supply of new applicants would be and how the quality of the new entrants might compare to today.

Within the debate about teacher recruitment policies, special attention has been directed toward solving the shortages of quality teachers in specific fields—generally including math and science, special education, and languages. Some see evidence of this shortage in the fact that a large number of courses are taught by “out of field” teachers.<sup>7</sup>

The particular policy prescriptions for dealing with this problem vary widely. Some ask for regulatory solutions—simply not permitting teachers to teach in fields for which they are not certified. It is unclear, however, what would happen when insufficient numbers of appropriate teachers were available. Others argue for a combination of altered teacher preparation and salary adjustments. This is discussed further below.

*Retention.* Perhaps the most frequently considered issue when discussing teacher policy is the overall level of turnover in teaching. Nationally, every year over 7% of the teachers with less than 3 years of experience quit the profession altogether, whereas another 13% change schools.<sup>8</sup> Even among the teachers with 4 to 9 years of experience, the annual exit rate is 5%, and the transfer rate is 10%. In sum, over one third of all new teachers

<sup>7</sup>See Ingersoll (2003).

<sup>8</sup>National data on teacher mobility can be found in Luekens, Lyter, Fox, and Chandler (2004).

leave the classrooms by the end of their 5th year. These statistics are frequently interpreted as a reflection that the best teachers—those with the best opportunities elsewhere—are leaving. As a policy prescription, this argument points to the necessity to raise salaries to limit this exodus from teaching and to maintain the quality of teachers.

Within the debate about teacher retention policies, special attention has been directed toward ensuring that low-income, minority children have access to a high-quality teaching. These concerns are frequently linked to the achievement gap between groups of different races and ethnicities. The gap remains large and impervious to recent policy efforts.<sup>9</sup> From evidence about the determinants of achievement, it seems clear that policies that aim to close the gap must find ways to upgrade the quality of the teachers available to disadvantaged and minority students and to create incentives for these teachers to stay in these more challenging schools.

Studies of teacher mobility, however, show that teacher exit rates tend to be significantly higher in the schools serving disadvantaged students.<sup>10</sup> Two problems are evident from this statistic. First, there is less continuity in the instructional program in the schools serving those most in need. Second, a high proportion of the teachers assigned to schools serving disadvantaged students are novice. Given that teachers tend to do a worse job in their first year or two in the classroom, this means that these students, who already need extra help, tend to get less prepared teachers.<sup>11</sup>

The most frequent suggestion made to improve the quality of the teachers available to disadvantaged students is to raise the salary levels for teachers in urban districts, so that schools can compete with alternative jobs and with more suburban schools. An alternative or addition to the proposed increase in overall salaries is increases that are largest in the most difficult schools, that is, "combat pay" to those teaching in the most disadvantaged schools. Variants on this also include various housing subsidy programs, student loan forgiveness, and so on.

### Teacher Compensation Policies

The traditional approaches to improving teacher quality have not focused directly on the outcomes of the teacher's students but instead relied

<sup>9</sup>For a discussion of the pattern of the Black-White achievement gap, see Neal (2006).

<sup>10</sup>See Hanushek, Kain, and Rivkin (2004a, 2004b) and Lankford, Loeb, and Wyckoff (2002).

<sup>11</sup>Two early investigations of experience effects and their interpretation are Murnane and Phillips (1981a) and Murnane and Phillips (1981b). More recent analyses that find any experience effects concentrated in the early years include Boyd et al. (2005); Hanushek et al. (2005); Kane et al. (2006); Rivkin, Hanushek, and Kain (2005); and Rockoff (2004).

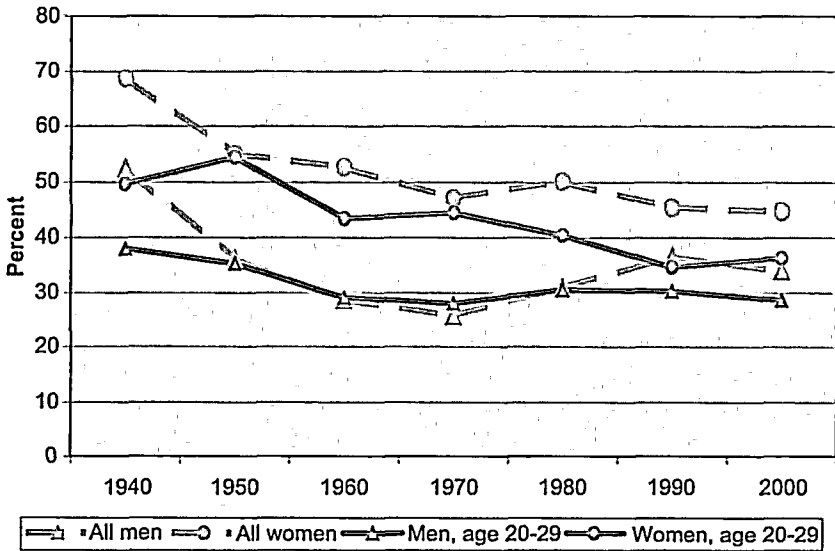


Figure 1 Percentage college educated earning less than average teacher, by gender and age, 1940-2000.

on a series of proxies for teacher quality. The most common measure used as a proxy of teacher's quality is the average salary paid to the teachers. As Figure 1 shows, ever since World War II, salaries of young female and male teachers have fallen relative to those of other occupations nationwide. Some have argued that the decline in the relative earnings of teachers has led to an obvious fall in the average teacher quality. However, the extent of the teaching decline is unclear because it depends in large part on the correlation between the teaching skills and those rewarded in the nonteacher labor market. For example, if teaching places greater emphasis on a set of communication and interpersonal skills than the general labor market, the salaries relative to all college graduates may not provide a particularly good index of teacher quality. In addition, the link between relative salaries and quality may be different today than in the 1960s and 1970s, a period of rapidly expanding opportunities and dramatic social changes for women.

Using the average teacher salary paid by different states to make assertions about the relative quality of their teachers would also be misleading. First, there are no reliable data on teacher salaries, because the federal government has failed to collect this information and only the teacher unions, with no external validation, have supplied such information. Second, states use different definitions and policies that do not permit direct

comparisons.<sup>12</sup> Third, average teacher salaries in a state are heavily influenced by experience and degree status of teachers.

From a policy perspective, there is no analysis that suggests that student achievement would improve from simply raising the salaries of all teachers across the board. Although it is plausible that increasing the average teacher salary would expand the pool of applicants, its impact on student achievement would depend on two factors. First, it depends on the ability of the school districts to identify the best teachers out of the pool of applicants without observing them in the classroom. Past evidence suggests that this is difficult and very imprecisely done. Second, it depends on the number of new, higher quality teachers that would be hired as a result. Increasing compensation of all teachers would provide incentives for both high- and low-quality teachers to enter and remain in the profession and would cut down teacher turnover—but this also lessens the possibilities to bring in newer, and better, teachers.

More important, the traditional teacher salary scheme only rewards experience and the possession of advanced education degrees, but, as previously discussed, neither of these, with the exception of initial experience levels, has been shown to be consistently related to student performance. As a result, salaries tend to be unrelated either to shortages of teachers or to quality dimensions.

The impact of the rigidities of the salary system could be ameliorated if the pay system were complemented by a policy of retention and replacement of teachers based on performance in the classroom or the demand for specialized teachers. Unfortunately, it is well documented that few dismissals are sought on the basis of teaching performance.

*The key to an effective teacher salary program must be funding that follows those who improve student performance. If the objective is improving student academic achievement, there is no substitute for policies that directly relate to student outcomes.*

The central argument behind this is that none of the generally used current policies reflect or promote teacher quality. Today's compensation policies reward characteristics that are not closely related to student performance, so it is not surprising that these policies do not promote better student performance.

At the same time, it is not entirely clear that performance based policies will do better. In particular, research on past experiences has asserted that "merit pay" has not and cannot work.<sup>13</sup> There are two things, however,

<sup>12</sup>See the analysis in Florida Department of Education (2006).

<sup>13</sup>The standard reference on merit pay is Cohen and Murnane (1986). The range of available evidence on teacher merit pay can be seen in Ballou and Podgursky (1993, 1997), Brickley and



worth noting about these studies. First, the merit pay plans analyzed involved quite small amounts of money. Second, most evaluations have judged the effectiveness of merit pay based on its ability to get more effort out of the existing teachers, as opposed to its ability to enhance the selection of good teachers. By only rewarding those who do well in the classroom, the hope is that most of those who do poorly will choose to exit, i.e., that the selection effects will be strong.

Thus, the effectiveness of any performance-based compensation program will depend on the answers to two questions. Are the rewards large enough to lead to a strong response on the part of teachers? Does this bonus lead to the right retentions and exits?

The reality is that we do not currently have much experience with the design of performance-based programs. Until recently, most efforts at large-scale performance-based schemes have been stymied, and little experience has accumulated. That situation may now be changing.

Florida has introduced a broad-based compensation policy. Backed by an appropriations of over \$150 million, Florida is moving to paying teachers directly on value-added to student achievement.<sup>14</sup> Other locales have also received considerable national publicity including the Denver and Houston negotiated contracts and the broader state policies in Minnesota. It remains to be seen how the details of any of these play out in terms of student achievement.

### Some Details

The particulars of the teacher compensation plan will undoubtedly take some effort and experimentation to work out. Moreover, the issues are directly relevant.

First, it seems clear that there should be strong rewards for individual classroom performance. Yet at the same time, it is appropriate also to consider some group rewards. Some aspects of teachers' jobs clearly involve joint activities with other teachers and staff. These activities should be acknowledged and rewarded. Some would argue, however, that only group rewards should be considered, because otherwise teachers will enter into competition with other teachers and will lead to lessening any of the cooperation that is necessary in schools. This latter argument almost certainly goes too far, because good teachers would not be encouraged to

Zimmerman (2001), Cohen and Murnane (1985, 1986), Cohn (1996), and Karnes and Black (1986).

<sup>14</sup>For details of the Florida plan, see Hanushek (2006).

go to schools in need if there were only group rewards. The correct split between group and individual rewards needs further work, although the data on the variations of performance within schools suggest that individual rewards should be very strongly encouraged.

Second, there are great advantages to including a teacher evaluation component based on observed test scores of students. (This component should, of course, reflect the value-added of teachers, or what each contributes to student achievement, and not just the overall level of student scores). At the same time, because of the broader impacts of teachers outside of just the tested subjects, other elements of supervisory or peer evaluations should probably enter. Again, the exact form and weight to these evaluations will require experimentation.

Third, evaluation systems will be needed in subjects that are not routinely tested under state accountability. Although reading, mathematics, and science are well covered by objective assessments, the same cannot be said for a wide variety of other subjects. The concepts of judging value-added are also less developed in subjects not involved in regular annual testing.

Fourth, another important aspect of a plan to have performance awards for teachers is to reward explicitly principals and administrators based on student performance. If principals are not also rewarded on student outcomes, they may not make decisions with student outcomes in mind. This pervades the area of performance rewards for teachers, because the leaders must have incentives to select, retain, and pay the teachers who are most productive in the classroom.

Fifth, to improve the quality of the teachers available to disadvantaged students, extra financial support for teachers in schools with concentrations of disadvantaged schools is likely to be necessary. It is unclear, however, exactly what financial incentives would be sufficient to retain teachers in these schools. Detailed studies on teacher mobility suggests that teachers are not very sensitive to salary changes when making their move decisions.<sup>15</sup> Moreover, it is important not just to think about across-the-board reward for teachers in heavily disadvantaged schools. It is important that these policies be monitored to ensure that they promote the retention of *high-quality teachers* in these schools, not just lower turnout rates alone. Recent work on teacher mobility in other places has shown that the teachers leaving the disadvantaged schools are not always the best.<sup>16</sup> In fact, they are on average similar or worse than those staying in terms of student achievement gains.

<sup>15</sup>See Boyd, Lankford, Loeb, and Wyckoff (2005) and Hanushek and Rivkin (2004).

<sup>16</sup>See Hanushek et al. (2005).

Sixth, rewarding the top performers does not ensure that all subjects are covered with high-quality teachers. The shortage of teachers with knowledge in math, science, and languages, for example, remains a concern. Maintaining a single salary structure based just on teacher experience and graduate education in the face of very different market conditions across fields does not seem reasonable.

Finally, the appropriate investment in both preservice and in-service training is a perennial issue. The standard approach has been heavily regulatory, mandating requirements for both preservice in in-service training and development. An integrated approach with performance incentives would, however, provide large rewards to teachers for their performance in the classroom and would let them decide on the appropriate training. Thus, teachers would gravitate toward only those training and professional development programs known to provide high value. Again, by concentrating on outcomes, it is possible to get behavior that reinforces student achievement. But by focusing on program inputs and attempting regulatory solutions, there is no assurance that the investments are well made.

## Conclusions

There is missing information on how best to structure incentives to affect the teacher labor market. Yet there is much less disagreement on the need to do so. At the heart of the issue is a series of rigid policies that inhibit movement toward high-quality teachers. It is extraordinarily important to move away from these policies and toward a system that emphasizes performance.

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