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Paying Teachers for Results

A Summary of Research to Inform the Design of
Pay-for-Performance Programs for High-Poverty Schools

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Center for American Progress



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Introduction and summary

Recent decisions and statements by the Obama administration and Congress demonstrate that federal education policies are finally recognizing the full potential of so called pay-for-performance programs to improve teaching and learning in public schools where the students live and study amid high rates of poverty. Important additional support for the two-year-old Teacher Incentive Fund, which was included in the American Recovery and Reinvestment Act of 2009, exemplifies the growing consensus among policymakers, researchers, and others that the traditional approach to compensating teachers lacks the subtlety and flexibility needed to help ensure that students in high-poverty schools have access to effective teachers.

Traditional salary schedules, in which salaries are fixed by a district or even statewide schedule, provide teachers with pay raises according to their length of service and post-baccalaureate educational attainment. But this pay system fails to account for differences in working conditions among schools; for higher demand for math, science, and special-education teaching skills; for teachers of English Language Learners; and perhaps most important, for performance in the classroom.

The Teacher Incentive Fund, or TIF, which was created in an appropriations bill in 2006, recognizes the idea that financial incentives, including pay-for-performance programs, can help make high-poverty schools more competitive in the labor market for effective teachers. TIF to date has awarded more than 30 grants, spurring growth at the state and local levels in this policy area, initially providing \$99 million in competitive, five-year grants to states, school districts, and nonprofit organizations that support “efforts to develop and implement performance-based teacher and principal compensation systems in high-need schools.” The American Recovery and Reinvestment Act of 2009 added an additional \$200 million in funding to support these programs.

This increased funding and increasing interest in pay-for-performance programs sparked the Center for American Progress to present this short paper on pay for performance. The paper first defines pay-for-performance and outlines its logic as a strategy to improve teaching and learning in high-poverty schools. We then proceed to summarize what researchers have learned about this compensation strategy, and then offer guidance to states and districts on the design of successful pay-for-performance programs based on this research.

Admittedly, there is an insufficient research base to specify “best practices” in the domain of pay-for-performance, but a number of design principles can be gleaned from existing research.¹ But as we will demonstrate in the pages that follow, the available evidence on pay-for-performance programs does point to the efficacy of awarding teachers and school staff incentives based on a variety of measures of teacher performance, including both student growth on standardized assessments and rigorous evaluations of teacher performance. Moreover, current research indicates that teachers would probably be more supportive of these types of programs when targeted to hard-to-staff schools. Finally, the research highlights the potential of school-level measures of student achievement, both as a means of balancing the volatility of measures of effectiveness for individual teachers, and as a way of folding teachers in non-tested subjects into a pay-for-performance program.

What is pay-for-performance?

Pay-for-performance programs award teachers with differential compensation based on some combination of measurable outputs and observed teacher performance. Measurable outputs typically aim to capture student learning attributable to a teacher or school, and can be derived from scores on standardized tests or other more complex assessments of student work. Value-added measures of teacher performance, which account statistically for students' academic experiences prior to entering a teacher's classroom, represent a concrete and much-studied approach. Observed performance entails the rigorous documentation of the skills, knowledge, and behaviors associated with effective teaching. Such documentation can be labor-intensive, involving repeated observations by trained principals, teacher leaders, or peer evaluators, usually with the aid of detailed rubrics tied to standards describing effective practices.

The experience of incremental change in education shows that where pay-for-performance programs take root, the payments generally appear to teachers as bonuses over and above a base salary tied to a traditional schedule. Securing the necessary political support for new compensation programs probably demands such a hybrid approach to compensation, but it is not the only way to go. There are a few examples, such as the Denver Public Schools' Pro Comp system, in which some of the compensation reforms are designed as part of the salary schedule rather than solely as bonuses on top of the traditional salary schedule.

In addition, there are many ways for pay-for-performance programs to be tailored to local tastes. Payments may reflect individual performance, the collective performance of a group of teachers, or some combination of individual and collective performance. Programs may reward all staff in a school, or only certified teachers.

Moreover, the basis of the reward and the weight given to each measure may vary. Case in point: South Carolina schools participating in the Teacher Advancement Program run by the National Institute for Excellence in Teaching, a 501(c)(3) organization supported by the Milken Family Foundation, a number of other foundations, charitable donations, and federal, state and local government funding. In the program, 40 percent of teachers' performance bonuses are based on teacher evaluations, 30 percent on classroom achievement growth, and 30 percent on school-wide achievement growth. In Denver's Pro Comp schools, measures of teachers' knowledge and skills, professional evaluations, labor market incentives, and student growth each play a role in determining a percentage of the district's salary index.

Although still relatively rare, pay-for-performance programs appear to be growing in number. According to analyses of data from the Schools and Staffing Survey administered by the U.S. Department of Education, 13.6 percent of districts rewarded excellence in teaching in 1999-2000 and 14 percent awarded excellence in teaching in 2003-04.²

Moreover, in 2003-04, 19.6 percent of districts responded that they rewarded some schools with a school-wide bonus or additional resources for a school-wide activity and 15.4 percent of districts responded that they provide a cash bonus or additional resources to individual teachers.³ This question was not asked in the 2000 version of the survey.

According to Education Week's Quality Counts, about 20 states offer financial incentives to teachers to teach in hard-to-staff schools and seven have performance-based pay programs. Several districts, such as Denver and Houston, also have performance-based pay programs.

The logic of pay-for-performance

As a strategy for improving access to effective teachers for students in high-poverty schools, the logic of pay-for-performance systems rests on two ideas. The first is that teachers will respond to financial incentives—bonuses—and will change the way they work in order to earn them. And the second is that pay-for-performance programs may recruit as well as retain more effective teachers in high-poverty schools. Let's consider these incentive effects and selection effects in turn.

Incentive effects

First, there is some evidence that financial incentives matter to teachers. The intrinsic rewards of helping students reach their potential are important, but teachers' career decisions can be tied to financial incentives. This is clearly true upon entry to the profession. Jennifer Steele of the RAND Corporation and co-authors Richard Murnane and John Willett, both of Harvard University, found that a California program offering a \$20,000 incentive for academically talented novice teachers to work in low-performing schools for at least four years increased their probability of them taking such a position by 23 percentage points.⁴

Teachers also express concern about their compensation when they leave the classroom. University of Pennsylvania researcher Richard Ingersoll conducted a 2004 analysis of data from the U.S. Department of Education's Teacher Follow-Up Survey and found that for teachers who left high-poverty schools because of job dissatisfaction, poor salaries were a primary reason for leaving.⁵ Among teachers in rural high-poverty schools, it was the reason cited more frequently than any other (56 percent). Yet among teachers in urban high-poverty schools, other factors were more frequently cited, such as poor administrative support (50.1 percent) and lack of faculty influence (42.5 percent).

In addition, when departing teachers were asked what schools could do to encourage teachers to remain in the profession, 69.9 percent of teachers in high-poverty urban schools and 64.8 percent of teachers in high-poverty rural schools suggested increasing salaries.⁶ So it seems that while difficult working conditions may lead to dissatisfaction, teachers believe that higher salaries can help to compensate for some of these challenges.

Moreover, teachers often say in surveys that working conditions matter more than pay, but Dan Goldhaber and colleagues at the Center for Reinventing Public Education found

that when given a choice between a \$5,000 increase in pay and three potential changes to working conditions, large majorities of teachers in Washington state favored the increase in pay. The changes to working conditions offered were as follows:

- Two fewer students in all of the classes you teach (82.7 percent preferred the \$5,000)
- A new full-time teacher's aide who splits time between your class and four other teachers at your school (88.01 percent preferred the \$5,000)
- Three-and-a-half more hours of prep time each week (69.35 percent preferred the \$5,000).

There also is evidence that teachers respond to the salary-related incentives embedded in the traditional approach to compensation. Since most salary schedules reward teachers for educational credits, many teachers go on to get advanced degrees. About 47 percent of teachers have a master's degree, 90.1 percent of which are in education.⁷ Another example is offered by the substantial stipends and bonuses available to teachers upon certification by the National Board for Professional Teaching Standards. As a result of these stipends, tens of thousands of teachers have re-allocated their time in order to pursue this certification.

Selection effects

A pay-for-performance program is intended to attract more academically able teachers and those with technical skills into the profession. It also may be designed to attract effective teachers to high-poverty schools. One of the disadvantages of the single-salary schedule is that it ignores labor market realities. Teachers with strong academic backgrounds and technical skills can be paid more in other fields than in teaching and therefore have higher opportunity costs when they choose to teach.

In an analysis of data from the Baccalaureate and Beyond data set from the U.S. Department of Education, Dan Goldhaber and colleagues found that “four years out of college, the gap in salary between teachers and non-teachers who have technical training is \$13,469, but only \$6,811 for those who do not have technical training.”⁸ This gap grows to \$27,890 by the time these teachers and non-teachers are out of college for 10 years.⁹ There is a similar gap for teachers who score high on the Scholastic Aptitude Test—for those in the top quintile, the gap between teachers and non-teachers is more than \$28,533.

And those teachers with high academic aptitude indicate that these differences in compensation matter to them because they are less likely to choose teaching as a profession in the first place and more likely to leave teaching than others.¹⁰ Teachers with higher scores on college entrance exams and those who attended selective institutions are more likely to leave the profession early and are less likely to return to it.¹¹ In addition, teachers in technical subjects such as mathematics and science are frequently in short supply, indicating that traditional salaries are not sufficient to attract them to the profession. Thus, a performance-based compensating wage differential can help school districts attract teachers to fill specific disciplinary needs.

How much of an incentive is enough to attract or retain a teacher in a high-poverty school?

There isn't a great deal of evidence about the level of performance bonus needed to attract or retain teachers in high-poverty schools, but there is some recent evidence that is suggestive. Researchers from the National Center on Performance Incentives are studying the impact of the Texas Educator Excellence Awards—a pay-for-performance program targeted to high-poverty, high-performing districts. Their study assessed the extent to which bonus awards influence an individual teacher's turnover decision in a group of 874 schools. They found that on average, awards of \$3,000 reduced the predicted turnover rate to less than a quarter of the rate that was expected before the Texas Educator Excellence Awards program was introduced.¹²

Similarly, an evaluation of a teacher compensation schedule in North Carolina that awarded annual bonuses to science, math, and special education teachers in high-poverty schools found that the program reduced turnover rates.¹³ While this program was not a pay-for-performance program, the findings are suggestive. An annual bonus of \$1,800 was sufficient to reduce average turnover rates by 12 percent. More experienced teachers were most responsive to the program—those with 10 or more years of experience were 37 percent less likely to leave.¹⁴ Moreover, as the researchers found that the state did not do an adequate job of educating all teachers about the eligibility criteria, the positive findings probably understate the potential of these types of programs to reduce turnover rates.

Another estimate comes from SUNY-Albany researcher Donald Boyd and colleagues using data from New York City. They found that it would be necessary “to pay teachers an additional \$2,900 to induce them to teach in a classroom with a 25 percentage point increase in the proportion of minority students but only an additional \$350 to teach in a classroom with a 25 percentage point increase in the proportion of students receiving free or reduced price lunch.”¹⁵

In a study investigating teacher mobility in Texas public schools, Hoover Institution researcher Eric Hanushek and colleagues estimated that an inexperienced female teacher would require a salary differential of about 25 percent to 40 percent to teach in a large urban district compared to a suburban district.¹⁶ This differential is likely higher than the other estimates because it does not take into account teachers who are more inclined to teach in high-poverty schools. Programs that are targeted to teachers who have an interest in teaching in a high-poverty school might require a more modest incentive.

How can programs be designed to elicit teacher support?

Teachers' attitudes toward differential pay are critical to the success of differential pay programs because without their support, programs will not be implemented effectively. Data from recent surveys of teachers can provide some guidance about how programs can be designed to elicit their support. Education Sector, an education think tank, and public opinion research company FDR Group surveyed a national sample of teachers on their attitudes towards a variety of teacher policies, including compensation reforms. They found that teachers' opinions on financial incentives varied, depending on how the incentives were determined:

- 80 percent favored incentives for “teachers who work in tough neighborhoods with low-performing schools”
- 58 percent supported incentives for “teachers who consistently receive outstanding evaluations by their principals”
- 53 percent favored incentives for “teachers who specialize in hard-to-fill subjects such as science or mathematics”
- 42 percent favored “teachers whose students routinely score higher than similar students on standardized tests.”

Dan Goldhaber and colleagues at the Center on Reinventing Public Education surveyed teachers in Washington state in the spring of 2006 on their attitudes toward differential pay. Overall they found that 83 percent opposed merit pay, 72 percent supported the idea of pay for teaching in high-needs schools, and 41 percent supported incentives for subject area expertise.¹⁷ Yet veteran and novice teachers and teachers teaching different grade levels had different views on these topics. Veteran teachers were slightly less supportive of all of these reforms than novice teachers. And high school teachers were more supportive. Interestingly, teachers who expressed a high degree of trust for their principals were almost twice as likely to be supportive of merit pay.

Researchers at the National Center on Performance Incentives surveyed teachers in schools involved in the Texas Educator Excellence Grants program in 2007 about the performance measures that they determined to be important in a performance pay plan. The TEEG program is a state-funded performance-pay program that awards grants to high-poverty, high-performing schools to implement performance-pay programs. (The program is described in further detail on Page 11.) The teachers surveyed ranked improvement in

students' test scores, collaboration with faculty and staff, and teaching in a hard-to-staff school as the top three items.¹⁸ It is instructive that those teachers participating in the Texas pay-for-performance program are more supportive of the use of improvement in students' test scores in a performance-pay program than a general sample of teachers. These teachers rated mentoring other teachers, performance evaluations by supervisors, and high average test scores by students as the least important performance measures.

Finally, researchers Brian Jacob of the University of Michigan and Matthew Springer of Vanderbilt University surveyed teachers in Hillsborough County, Florida, on their attitudes towards performance pay. The County participates in Florida's statewide performance-pay program, the Merit Award Program. Only 50 percent of the surveyed teachers agreed that "incentive pay based on individual performance would be a positive change in teacher compensation policy."¹⁹ About half of teachers were supportive of performance pay based on test results—"46 percent of teachers thought student gains on Florida's Comprehensive Assessment Test were of moderate or high importance, and 54 percent believed student gains on standardized tests other than FCAT should be considered moderately or highly important in determining awards."²⁰

It is possible, however, that these findings are affected by teachers' negative perceptions of the Merit Award Program. In fact, 57 percent of the surveyed teachers "disagreed that MAP would distinguish effective from ineffective teachers in their school, and 50 percent did not think MAP would have beneficial effects on teaching and learning."²¹

Similar to some of the earlier findings, this study found that teachers with one to three years of experience were more supportive of pay-for-performance than teachers with more than 20 years of experience and that teachers in elementary schools were less supportive of incentive pay than teachers working in middle schools or high schools.²² In addition, teachers who had a positive view of their principal's leadership ability and were more confident in their teaching ability were more supportive of performance pay.

Taken together, these findings point toward four key ideas. First, teachers are more likely to support performance-pay programs targeted to high-needs schools than to all schools. Second, novice or younger teachers may be more receptive to performance-pay programs than veteran teachers, which means more outreach may be needed to veteran teachers or perhaps programs should begin by including only novice teachers and allowing veteran teachers to opt in if they choose.

Third, teachers are likely to be more supportive of programs that rely on a variety of measures of teacher performance rather than those that only rely on one measure. Fourth, teachers will be more supportive of performance pay if they trust their principals and therefore strong relationships between teachers and principals are an important prerequisite for successful programs.

What should incentives be based on?

While there isn't sufficient research to determine the optimal incentive design for pay-for-performance programs, a good deal of evidence highlights the importance of using a variety of measures of teacher performance. First, programs that have relied solely on standardized test scores have faced a great deal of political opposition.

Florida's initial E-Comp program, the precursor to the current Merit Award Program, and Houston's Teacher Performance Plan were hugely unpopular and had to be revised in response to political opposition. Both programs awarded bonuses to teachers based solely on their students' performance on standardized assessments and did not include teachers in developing their design.²³

The experience of these two programs shows that value-added estimates of teacher effectiveness can help build support for the inclusion of student achievement data in a program, but that numerous problems with such estimates suggest it would be unwise to design a new pay-for-performance program purely around the value-added measures of teacher effectiveness.²⁴ Additionally, since 69 percent of teachers cannot be tied directly to tests of student achievement,²⁵ it makes sense to pursue other more inclusive approaches to measuring performance.

Moreover, in the context of pay-for-performance, it is imperative to design programs that elicit positive changes in teacher behavior rather than undesirable responses. Tying incentives to one measure of student performance may lead to undesirable teacher responses, such as the devotion of instructional time to inappropriate ways of improving student performance on the outcome tied to the incentive. Programs should be designed to discourage teachers from overly focusing on test-taking strategies, repetitious drill on a narrow band of curricular material believed to be heavily represented on state exams, or coaching during the exams.

More inclusive approaches can be derived from high-quality evaluation systems that incorporate a variety of student outcomes and observations of teacher performance, in addition to value-added estimates. Unfortunately, most evaluation systems today are not sufficiently rigorous. States and districts that want to design performance-based compensation upon professional evaluations must ensure that their evaluation systems are rigorous, valid, and reliable.

Evaluation systems also should be correlated with student achievement data—that is, teachers whom observers rate more highly should achieve better results in terms of student achievement. Few frameworks have been evaluated on this basis to date, and the existing research on this topic has generally found a small positive relationship or very little relationship between the ratings based on these frameworks and student achievement as measured by test scores.²⁶ Further research is needed to evaluate whether existing frameworks are accurately distinguishing between teachers who are more and less effective at improving student learning and to inform improvements to these frameworks.

Putting it all together

Recent evaluations of performance-pay programs

A number of recent evaluations of existing pay-for-performance programs point to the promise of this strategy and highlight some potential program designs. The programs vary along a number of dimensions:

- Individual versus school-wide incentives
- The measures upon which incentives are based
- Whether the reforms include professional development and different roles and responsibilities for teachers

Some of the most rigorous evaluations come from performance-pay programs in India, Kenya, and Israel. While they are not profiled here, they generally find the programs have a positive impact on student achievement and the programs are generally designed to provide individual or school-wide bonuses to teachers based on students' test scores.²⁷ Unfortunately, it is not possible to determine from these separate studies which designs are most effective in terms of improving student achievement, teacher skills, or teacher retention. Thus we turn to a few select evaluations done in the United States.

Achievement Challenge Project²⁸

The Achievement Challenge Pilot Project in Little Rock, Arkansas, rewarded teachers with bonuses for students' gains on standardized assessments. Researchers Gary Ritter and colleagues at the University of Arkansas evaluated the program by analyzing student test data for all students in Little Rock elementary schools between the 2004-05 and 2006-07 school years. They also conducted teacher surveys and interviews to gain an understanding of the program's effects on teacher attitudes and school climate.

They found the program had positive effects on student achievement in mathematics, language, and reading. Teachers also had somewhat positive attitudes toward the program. Because the study included only three schools for its full duration, these results should be interpreted cautiously.

Denver's Pro Comp Program

In Denver's Professional Compensation Program for teachers, incentives are tied to a variety of teacher inputs and outputs. These inputs and outputs can be grouped into four categories: knowledge and skills, professional evaluation, market incentives, and student growth.²⁹ Within each of these categories, there are a number of elements that influence the teacher's salary.

In the category of knowledge and skills, for example, teachers can earn salary adjustments for completing professional development units and completing an advanced degree and license. In the category of student growth, teachers whose students' scores on the Colorado Student Assessment Program exceed district expectations for growth receive a 6.4 percent bonus and teachers in schools designated as a "Top Performing School" based on the Denver Public School Performance Framework receive a 6.4 percent bonus as well.

Researchers at the University of Colorado School of Education conducted a mixed methods evaluation that included an analysis of student achievement trends using value-added methodology and a survey to assess principal and teacher attitudes toward the program.³⁰ With regard to student achievement, the researchers found that teachers who chose to participate in Pro Comp produced slightly higher student achievement in reading and mathematics.³¹ The researchers were not able to attribute this difference directly to Pro Comp, however, because it was possible that more successful teachers opted into the program.

Incentive programs in Texas³²

Texas has made the largest single state investment in performance pay programs in the country. It has developed a group of three performance pay programs—the Governor's Educator Excellence Grants, the Texas Educator Excellence Grants, and the District Awards for Teacher Excellence. Texas has partnered with the National Center for Performance Incentives to evaluate the programs. To date, the Center has evaluated the TEEG and GEEG programs using randomized designs.

The TEEG and GEEG programs are similar in design, although the TEEG program provides \$100 million per year in funding for annual grants that range from \$40,000 to \$295,000 to all eligible schools, while the GEEG program provides \$10 million in non-competitive, three-year grants to 99 schools ranging from \$60,000 to \$220,000 per year. Both programs are targeted to schools that enroll high percentages of economically disadvantaged students (the GEEG targets the top third, while the TEEG targets the top half). Schools also must be high-performing—they must either receive an exemplary or recognized state accountability rating or rank within the top quartile of performance in improvement in mathematics, reading, or both.

Both the GEEG and TEEG programs separate funding into two parts. Part I funding, which comprises at least 75 percent of a school's award, is used to provide incentives to classroom teachers. Part II funding, which comprises 25 percent or less of a school's award, is used for bonuses for other school staff, professional development, and other purposes. Part I funding must be made based on improved student performance using objective, quantifiable measures and collaboration with faculty and staff that contributes to improved overall student performance. Schools also may incorporate other criteria in determining Part I funding, such as initiative, commitment, and professionalism.

The first-year evaluation of the GEEG program found that the performance incentive programs appeared to be having “an encouraging impact on schools’ organizational dynamics, teachers’ perceptions of performance incentives, and teachers’ instructional practice.”³³ Teachers viewed the program favorably. For instance, 66.8 percent of teachers either agreed or strongly agreed that the program was having beneficial effects on their school.³⁴ A majority (53 percent) of teachers also reported making specific changes to their instructional practices in response to GEEG.³⁵ But the authors felt that it was too soon to attribute these outcomes to the programs. It also was too soon to look at the program's impact on student achievement and other outcomes.

The second-year evaluation of the TEEG program found that the relationship between the program and student achievement was inconclusive, but the authors were hopeful that they would be able to determine such a relationship in future years of the evaluation. Another interesting finding was that the receipt of bonuses reduced teacher turnover in TEEG schools. Specifically, “the receipt and size of actual Cycle 1 bonus awards (the first group of bonuses awarded) had a strong impact on teacher turnover, and the probability of turnover fell as the TEEG bonus award grew.”³⁶

Mission Possible program³⁷

The Mission Possible program is a comprehensive teacher-incentive program in the Guilford County School System in Greensboro, North Carolina. It is intended to attract and retain effective teachers in struggling schools. The program began in 20 schools in the 2006-07 school year, and eight schools were added in the 2007-08 school year with a Teacher Incentive Fund grant from the U.S. Department of Education. The program entails ongoing professional development, collaborative support, and smaller class sizes. Teachers are offered recruitment or retention bonuses to work in Mission Possible schools and become eligible for performance bonuses. Recruitment and retention bonus amounts vary by grade and subject level, but range from \$2,500 for teachers in grades K through 5 to \$10,000 for teachers of Algebra I.

Teachers in grade levels and subjects that are part of the state and national accountability systems are eligible to receive performance bonuses based on student performance on

the state's assessments. These include teachers of third through fifth grade; sixth- through eighth-grade teachers of math, language arts, or reading; high school math and English I teachers; and curriculum facilitators and principals. To measure student growth, the district uses the Value Added Data model developed by Bill Sander of the SAS Institute to produce value-added measures of student achievement for individual teachers.

Teachers whose mean student growth is one standard error above the district mean receive a \$2,500 performance bonus, while those whose students' mean growth score is 1.5 standard errors above the district mean receive a \$4,000 incentive. Teachers in untested subjects are not eligible for performance bonuses through the district's grant program, but are eligible to receive school-wide bonuses through the state's ABC accountability program.

Researchers at the SERVE Center at the University of North Carolina at Greensboro are conducting an evaluation of the program. The evaluation consists of comparisons between Mission Possible and non-Mission Possible schools on a number of dimensions of student and teacher outcomes. The data will include student and teacher records, assessment results, interviews, and surveys. After one year of implementation, researchers found the program schools showed reductions in teacher and principal turnover, increases in the percentage of students passing the state assessment, and improvements in Annual Yearly Progress goals obtained.

North Carolina's ABCs school-wide bonus program³⁸

Researcher Jacob Vigdor of Duke University evaluated the impact of a school-wide bonus program that has been in operation in North Carolina since the 1996-97 school year. The ABCs program pays bonuses to all teachers in a school based on their students' growth on the state assessments. Levels of bonuses vary for certified and non-certified staff and vary based on the level of student growth. All certified staff in schools that achieve "high growth" based on performance on the state's assessment receive up to \$1,500, while teacher assistants receive up to \$500.³⁹ All certified staff in schools that achieve "expected growth" receive up to \$750, while teacher assistants receive up to \$375.

Vigdor found some evidence of overall improvements in test scores. Specifically, math proficiency rates in the state increased "both on the high-stakes test used to determine bonus eligibility and on the lower-stakes National Assessment of Educational Progress exam. Reading proficiency rates have improved only on the state's own examination."

He also found that schools did implement changes when they failed to receive a bonus. But he did not find evidence that the program closed achievement gaps. He theorizes that teachers reacted to the program by leaving disadvantaged schools where they perceived less likelihood of earning bonuses. He posits that the program should have included a measure of expected gains in the formula for determining awards, thereby not disadvantaging teachers in schools where gains are harder to achieve.

Teacher Advancement Program⁴⁰

In 2008, under the banner of Vanderbilt University's National Center on Performance Incentives, researchers Matthew Springer, Dale Ballou, and Art Peng released findings from the first independent evaluation of the Teacher Advancement Program in two undisclosed states. TAP is a comprehensive school reform model designed to attract effective teachers, improve the quality of instruction, and improve student achievement. The study used a panel data set to compare students' test score gains in mathematics in schools in two undisclosed states that participated in TAP with student test score gains in non-TAP schools.

The authors found compelling evidence that TAP schools produce larger gains in the mathematics achievement of students in grades 2 through 5. The reported effects are statistically and educationally significant. Evidence about the effects of TAP schools for older students is less clear-cut, and the study surfaces the important question of whether measures of achievement gains for older students are sensitive to the level of stakes attached to the tests involved.

Review of research on performance pay⁴¹

A recent synthesis of research also provides some promising evidence in support of performance-pay programs. Researchers Michael J. Podgursky from the University of Missouri and Matthew Springer from Vanderbilt University summarized evaluations of performance-pay programs that used a treatment-and-control design and found that all of these programs had positive effects on the outcome tied to the incentive. Podgursky and Springer concluded that "while the literature isn't sufficiently robust to prescribe how systems should be designed—optimal size of bonuses, mix of individual versus group incentives—it is sufficiently positive to suggest that further experiments and pilot programs by districts and states are in order."

Additional evidence will be available beginning in 2011 from the National Center on Performance Incentives, which received a five-year, \$10 million grant from the U.S. Department of Education's Institute of Education Sciences to study the effectiveness of performance incentives. One study of central interest employs a randomized experimental design to assess the causal impact of a pilot program in Nashville public schools. The program allows mathematics teachers to earn bonuses of up to \$15,000 per year, conditional on their students' gains on state exams.

How can programs incorporate evaluation?

The state of knowledge about optimal designs of pay-for-performance programs leaves much to be desired. What is needed are careful evaluations of a variety of pay-for-performance designs. Such evaluations, which can be thoughtfully planned into projects supported with new Teacher Incentive Fund grants, can address specific voids in the empirical literature and, if carried out effectively, inform policy.

Programs may vary widely in their design and implementation. Findings about one program are not sufficient to answer the more general question about whether pay-for-performance programs are effective. It's likely that the impact of programs will vary based on their design, the context in which they operate, and the quality of implementation.

Moreover, a convincing causal link between pay-for-performance programs and important outcomes like student achievement, teacher recruitment, and teacher retention is not the only line of inquiry worthy of pursuit. Explanations of how programs actually affect the outcomes also are needed to help inform the design and refinement of such programs. Thus, states and districts contemplating the design and implementation of new pay-for-performance initiatives should be sure to set aside internal research capacity or establish appropriate partnerships with outside organizations well before the first performance-based bonus is paid.

Conclusion

At this point there are more questions than answers in the research on performance pay, but existing research findings suggest that the strategy holds promise for improving student achievement. There is less information about the impact on teacher recruitment and retention. This paper summarizes recent literature to inform the design of performance-pay programs, and also is intended to help grantees and potential grantees of the Teacher Incentive Fund.

Of course, more research is needed to determine optimal designs for programs, but more experimentation is needed as well so researchers have different program models to compare and to study. Without this experimentation, we will be unable to build a body of “best practice” in performance pay to guide future program designs.

Appendix

Component of Index \$36,635	Knowledge and Skills			Professional Evaluation		Market Incentives		Student Growth			
Element	Professional Development Unit	Advanced Degree and License	Tuition and Student Loan Reimbursement	Probationary	Non-Probationary	Hard to Serve School	Hard to Staff Assignment	Student Growth Objectives	Exceeds CSAP Expectations	Top Performing Schools	High Growth School
Description of Element	Base building for 1st PDU earned in 08-09 and any PDUs banked prior to 9/1/08. 2nd PDU earned in 08-09 is paid as non-base building. See footnote for rules for banked PDUs and PDUs earned starting in 09-10 yr1.	Grad. Degree or National Licenses and Certificate	\$4,000 lifetime account; no more than \$1,000 per year	Satisfactory Evaluation: Unsatisfactory teachers ineligible for PE increase	Effective 2009-10 school year element earnable to teachers who have 1-14 years service credit only.	Those in schools designated "Hard-to-Serve".	Those in designated "Hard-to-Staff" positions	Base building when 2 SGOs are met, non base-building when only 1 SGO is met. (See description below*)	Teachers whose student CSAP scores exceed district expectations for CSAP growth	Teachers in schools designated as a "Top Performing School" based on the DPS School Performance Framework	Teachers in schools designated as a "High Growth School" on the DPS School Performance Framework
Affect on Base Salary	Base Building2	Base Building	Non-Base Building	Base Building	Base Building	Non-Base Building	Non-Base Building	Base Building4	Non-Base Building	Non-Base Building	Non-Base Building
Percent of Index	2%	9% per degree or license. Eligible once every 3 yrs	N/A	1% every year	3% every three years	6.4%	6.4%	1%	6.4%	6.4%	6.4%
Dollar Amount	\$733	\$3,297	Actual expense up to \$1000/Yr. \$4000 lifetime	\$366	\$1,099	\$2344.64 \$195.39/ mo	\$2345 x # of assignments held	\$366.00	\$2,344.64	\$2,344.64	\$2,344.64
Builds pension and highest average salary	Yes	Yes	No3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adds to Pension	Yes	Yes	No3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Payment Frequency	Monthly installments	Monthly installments	Up to \$1000 per year	Prorated over 12 months	Prorated over 12 months	Monthly installments	Monthly installments	1 objective: Paid lump sum. 2 objectives: Paid in monthly installments	Paid lump sum	Paid lump sum	Paid lump sum
Payment Type and Frequency	Monthly installments upon submission of proper documents	Monthly installments upon submission of proper documents	Up to \$1000 per year upon submission of proper documents	Prorated over 12 months. If unsatisfactory delayed at least 1 yr	Prorated over 12 months. If unsatisfactory delayed at least 1 yr	Monthly installment upon completion of service each month	Monthly installment upon completion of service each month	1 objective: Paid lump sum. 2 objectives: Paid in monthly installments	Paid lump sum in the year following assessment	Paid lump sum in the year following assessment	Paid lump sum in the year following assessment

Source: Denver Public Schools, ProComp Payment Chart, available at <http://denverprocomp.dpsk12.org/about/>.

Notes: These amounts and terms are based on the agreement approved by DCTA membership. ProComp pay referenced in this document is based on an index amount of \$36,635. Amounts are based on 1 FTE (except for Tuition Reimbursement) and are prorated. School Performance Incentives, Distinguished Schools and High Growth Schools are based on the School Performance Framework, which you can read about on the Denver Public Schools website. The exact targets for determining the Schools receiving these incentives are set by the transition team.

1 2nd and subsequent PDUs earned in the 2008-09 contract year and any earned in 2009-10 and beyond will be paid or banked according to years of service credit in effect during the contract year in which the PDU will be paid.

2 Beginning 2009-2010, will build base salary for teachers with 1 to 14 years of service credit and not build base salary for teachers with 15 or more years of service credit.

3 All incentives except Tuition Reimbursement are pensionable. In other words, all ProComp payments are taken into account in calculating your highest salary upon which your pension is based.

4 Regarding the Student Growth Objectives, teachers will receive the amount as a lump sum non-base building incentive if 1 objective is met, and as a base building payment if 2 objectives are met.

Endnotes

- 1 States and districts also may be interested in principles gleaned from experiences with successful and unsuccessful models. See Joan Baratz-Snowden, "The Future of Teacher Compensation: Déjà Vu or Something New?" (Washington: Center for American Progress, 2007).
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