Why Districts Should have the Say: Comparing Teacher Merit Pay and Student Outcomes at the State Level

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Abstract

The literature surrounding education connects merit pay systems that compensate teachers for their performance to improvements in student outcomes. Teacher payment systems are important to the economics of education policy, not only because teachers are paid using these systems, but also because they are a tool to improve student outcomes. There are criticisms concerning the implementation of a merit pay system including inequality, subjectivity, and unintended consequences. Data on student achievement based on the National Report Card of 2022 and performance-based pay systems seem to have inconsistent implications for the merit of a performance pay system. Considering this, letting the districts decide their pay system is the best policy option.

Keywords: Education, merit pay system, teacher payment system, education policy, inequality, National Report Card, performance pay system, school districts

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at the State Level

Paying teachers a flat base salary has become steadily scrutinized, especially with

growing support for pay based on performance. Historically, teacher payments have gone

through three movements: "an initial rural tradition of paying teachers room and board, a move

to a grade-based salary schedule, and finally the shift to today's single salary schedule" (Protsik,

1995, 1). The first payment movement was during the time of agriculturally based, one-room

schoolhouses when classes were scheduled based on the seasons and teachers were expected to

only teach reading, writing, and arithmetic (Protsik, 1995, 2). This payment movement was

characterized by teachers being paid low money wages from local taxes, but having their housing

and meals provided for by rotating around their pupils' houses which also served as a community

check on teacher morality and quality (Protsik, 1995, 3).

The second movement occurred when America transitioned away from agriculture to

urbanization, causing a shift towards centralizing education into larger districts with

superintendents who "supervised" teachers who were required to have more certifications

(Protsik, 1995, 5). Teacher pay became a divisive factor in the on-going hierarchical, gender

divide in teaching, as teachers were offered scheduled salaries from districts either at the

minimum state requirements or on a differentiated salary schedule, where teachers were paid

differently based on innate factors as well as the grade level being taught (Protsik, 1995, 6). The

third payment movement was spurred by backlash against the unequal distribution of wages

(Protsik, 1995, 9).

This led to the current payment structure of a single salary schedule where teachers are

paid based on an "equity and objectivity" focused matrix structure with columns based on

educational attainment and rows based on years of experience (Protsik, 1995, 9). This allowed

for pay increases based on teacher achievements. The teacher payment system has not had an

overhaul since the third movement. One widely discussed alternative to the flat-based matrix

payment schedule is the merit pay system.

The terms performance pay, pay-for-performance, and merit pay have been used

interchangeably to discuss this alternative payment system. Merit pay is a system under which

teachers are paid incentives based on whether they can meet certain desired outcomes, typically

including student outcomes. There are several types of performance-based incentive programs

that school systems choose to implement, including individualized and group-based systems.

This discussion focuses primarily on three systems: individual-based, group-based, and targeted

merit payment systems. A fourth system, collective bargaining, based on paying all teachers the

same, provides important context, but is not the focus of this paper.

Merit pay is determined by outcomes. This focus and how outcomes are measured is,

therefore, important to the discussion on the effects of merit pay. The literature has investigated

the how teacher merit pay effects student outcomes (depending on the type of payment system),

how these outcomes are measured, and which systems and measurements are effective at

achieving increased student outcomes. This paper will compare student test scores and payment

systems used within a selection of high, middle, and low-achieving states to determine if there is

a potential correlation and who should determine whether merit pay should be implemented.

Literature Review

There are many teacher payment systems that United States school districts could use to

pay their teachers. Gilpin and Kaganovich (2012) studied the quality versus quantity crisis of

American K-12 teachers under collective bargaining (419). Collective bargaining, or

unionization, requires many teachers to be paid the same, regardless of quality. This leads to some teachers being paid more than their inputs and returns of labor would dictate in a more competitive market (Gilpin & Kaganovich, 2012, 427). A proposed solution for collective bargaining inefficiencies is merit pay (Gilpin & Kaganovich, 2012, 427). Workplace composition and specific types of incentive plans, leading to teacher behavior changes, might be the cause of mixed effects on student outcomes (Jones, 2013, 163).

Merit pay systems in public education can lead to better student outcomes by financially rewarding teachers for their performance when three conditions are met: individual teacher quantifiable output, motivation from pay, and clear expectations with only one supervisor (Cailler, 2010, 59). This is an individual-based, not group-based, merit pay perspective. It is difficult to fully meet these requirements of an individual-based system. Because of the difficulty of providing individual feedback on performance to change teacher effort at the individual level, group-based performance awards should be explored instead (Brehm, et al., 2017, 149). In a study on ASIRE incentives, a rank-order tournament where teachers compete for financial awards based on student test scores in Houston, teachers close to the performance cut-off did not have any effect on student performance in any subject except a small effect in science (Brehm et al., 2017, 145). These findings go against the assumption that individual teachers close to being rewarded will try to increase performance for their bonus. The tournament-style individual system also raises the question of the effect of competition between teachers in an individualized system.

In a study on the failures of a group-based New York City Bonus Program, student outcomes in math rose when there were fewer teachers while no increase in student outcomes occurred when there were a larger number of teachers, a condition of many New York City

schools (Goodman & Turner, 2013, 418). Larger groups of teachers in group-based incentives are less effective at changing student outcomes because of a lack of monitoring ability and the diffusion of responsibility (Goodman & Turner, 2013, 418). Merit pay programs that have successfully increased positive student outcomes in the first year of implementation can show weakening progress or no change in progress in subsequent years (Goldhaber & Walch, 2012; Balch & Springer, 2014). This indicates that teachers as a group may be motivated to maintain the incentive but have difficulties increasing student outcome success after some point, or simply an increase in free riding when the groups are already meeting goals. Because free riding is a problem in group-based incentive programs, a targeting-based system could be beneficial.

There are potential benefits to student outcomes under a targeted group approach rather than a collective bargaining flat pay, an individualized competitive system, or a group system inclusive of everyone. The targeted group approach is "structured as a team incentive program, with group performance determining the total incentive payment, which is then divided among team members regardless of individual performance" (Lavy, 2007, 89). Targeted systems foundationally believe most teachers should have the chance to be rewarded, but in practice not all teachers should get the reward (Lavy, 2007). Targeted salary incentives led to better student outcomes at all amounts of incentive levels while non-financial incentives were unrelated to any growth (Figlio & Kenny, 2007). There is also evidence that targeted incentives for teachers to match the pay base of surrounding school districts can increase student science scores when compared to schools that lagged (Tran, 2017).

Test scores are a common way to measure student outcomes to determine teacher merit pay. Teacher pay and quality were linked to improved test scores in Los Angeles County high schools (Cebula et al., 2013). Other studies have shown positive connections between student

test scores and complex merit payment systems which include rewarding teachers for additional

performance beyond student outcomes (Balch & Springer, 2014; Goldhaber & Walch, 2012; Dee

& Keys, 2004). Tennessee's former merit pay system, the Career Ladder Evaluation System,

combined salary and increasing professional duties as a reward (Dee & Keys, 2004.) Teachers at

the top of the Career Ladder incentive scale were not the best at improving test scores, even

though the program increased student math test scores (Dee & Keys, 2004). This may display

trouble rewarding teachers who are the most effective at improving test scores within certain

performance systems. Other studies have found the opposite. The most effective teachers, for a

school in rural Tennessee, are in the higher levels of bonuses of their programs (Boudreaux &

Faulkner, 2020, 33). This showcases the difficulty of comparing programs with different

structures and at different times within each system's requirements.

There have been complaints about test scores not being the best way to assess student

achievement (Kim, 2021). Excluding test scores would impact the ability to measure teachers'

merit for student outcomes. However, there are other ways to measure student outcomes. Merit

pay based on excellence in teaching increased graduation rates but have no effect on dropout

rates in schools across the United States (Gius, 2013).

Dangers in how to measure teacher quality and merit for performance-based systems

exist especially regarding unintended consequences. The process for determining teacher merit

and student success in a study of two Michigan high schools' data from 1996 was based on

student attendance on a randomized day and enrollment rates at the end of the semester as well

as a separate incentive based on achieving the desired student evaluation score (Ebert, et al.,

2002). Teachers were thought to be changing content to be more entertaining in order to receive

better scores and course retention (Ebert, et al., 2002). Some measurements do not increase

student learning.

Merit pay systems have positive effects on student outcomes, but there are contradictions

and confusion about which elements of performance to reward without encouraging unintended

consequences. A system that pays every teacher the same does not encourage or reward

increased performance. Individual performance systems might encourage harmful competition.

Group performance systems allow individuals to benefit without contributing. Combining

individual and group approaches into a targeted performance incentive program may be the best

merit pay system. How outcomes, especially student outcomes, are measured is an important part

of the merit pay process. Based on the literature, targeted merit pay improves student outcomes

with the least negative effects and with test scores as the best measurement of merit for student

outcomes.

Economics of Education Policy

Diverse types of teacher payment systems are important within education policy.

Teachers receive compensation for their work through payment within the field of education, but

this notion blends with the debate on how to use the compensation system to improve the quality,

and sometimes quantity, of the education system. In part, this stems from a desire to efficiently

allocate a limited number of resources. Incentives, like payment, are important motivating

factors - but deciding on and implementing the most effective incentives can be challenging. As

discussed in the literature review, there are many ways teachers can be compensated for their

work. Teachers could be paid through a base salary, merit pay, bonuses, or incentives. This

payment system could be under either union, individual, group, or combination merit. There are

advantages and drawbacks within each payment system and different ways to measure the

success of teachers and students using these diverse systems depending on the goals of the system.

Issues Surrounding Merit Pay Systems

While the literature is overall positive when discussing merit pay, there are many criticisms of these systems for teachers. Most forms of teacher performance evaluations are subjective with middle-performing teachers as the most difficult to distinguish (Jacob & Lefgren, 2008). Other evaluation types, on the contrary, have increased teacher performance (Taylor & Tylor, 2011). There is potential for merit pay to lead to inequality through a pay gap, as seen in other fields (Woodhams, et al., 2015) or lack of pay gap that teachers feel is deserved when lower performing teachers are given the same pay as higher performing teachers (Terpstra & Honoree, 2005). Additionally, there is also an issue as to whether merit pay will decrease the cooperation of teachers and lead to more competition amongst educators as well as the unknown potential costs associated with maintaining a merit pay system.

In a similar fashion, merit pay based on student outcomes also cause unintended consequences like teachers focusing only on topics that are testable or focusing on only "teaching to the test" rather than encouraging learning. Nevertheless, there are ways to counter a narrow testing focus through exam design (Yeh, 2005). Additionally, high-stakes testing can also narrow the curriculum to the tests, increase testing anxiety for both students and teachers, and disproportionately affect minorities or disadvantaged students (Blazer, 2011). The use of student test scores also exclude other relevant factors that play into student testing (Baker, et al., 2010). Comparing these criticisms to the positives, it is important to evaluate whether student outcomes are related to certain payment models by state.

Data Analysis of State Level Student Achievement and Payment Systems

It is important to first recognize which states are performing well in student achievement. The National Center for Education Statistics (NCES), within the U.S. Department of Education and the Institute of Education Sciences (IES), conducts a National Assessment of Educational Progress (NAEP) (National Report Card, 2022), testing 4th, 8th, and 12th Grade students on mathematics and reading every year (National Report Card, 2022). It also tests science, writing, and other topics which vary by grade and whether the results are available for the year (National Report Card, 2022). Figure 1, Figure 2, Figure 3, and Figure 4 were compared to identify which states performed above, around, or below the national public (NP) average for mathematics and reading scores of 4th and 8th Graders in 2022. 12th Grade figures for mathematics and reading were excluded because they were unavailable for 2022 (National Report Card, 2022). For brevity, the other topics studied by the NAEP were not included in this paper.
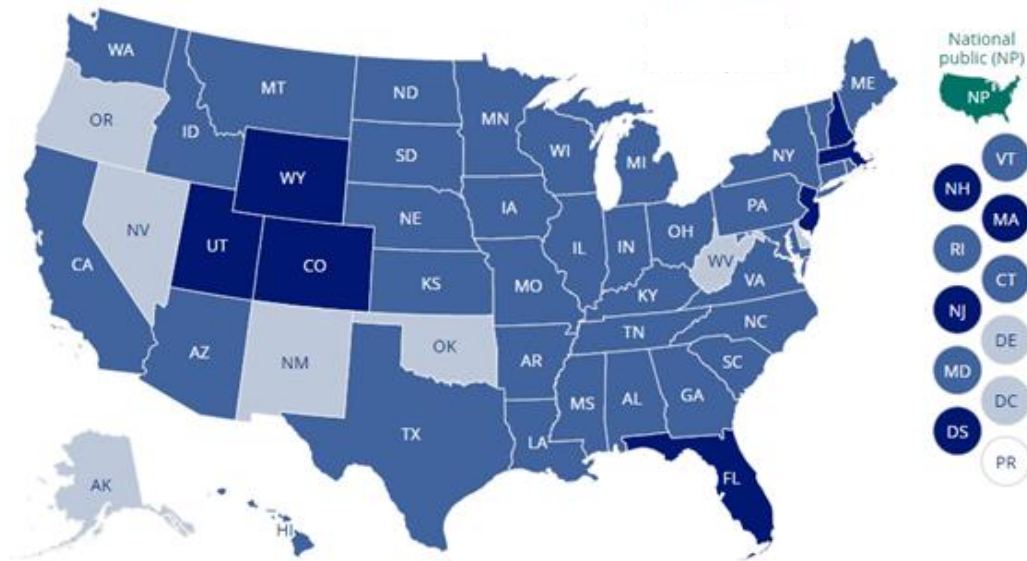
Figure 1

Mathematics, grade 4, Difference in State average score and the National Public average score

(235 out of a 0-500 scale) between jurisdictions, for all students [TOTAL]=All Students, 2022.

(The Nation's Report Card, 2022)
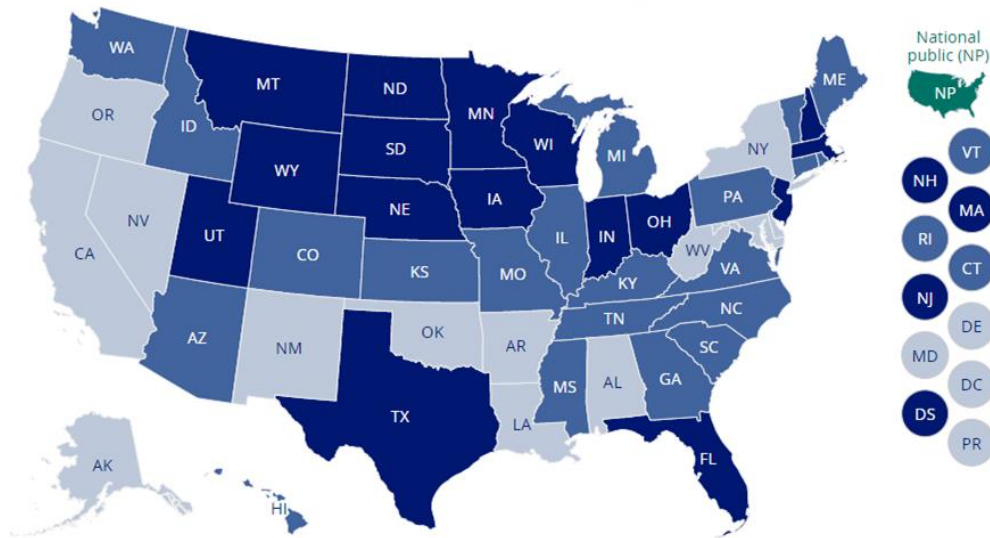
☐ Scores significantly below average

◻ Scores not significantly different than the average

◼ Scores significantly higher than average

Figure 2

Reading, grade 4, Difference in State average score and the National Public average score (216 out of a 0-500 scale) between jurisdictions, for all students [TOTAL]=All Students, 2022. (The Nation's Report Card, 2022)

☐ Scores significantly higher than average

☐ Scores significantly below average

■ Scores not significantly different than the average

■ Scores significantly higher than average

Figure 3

Mathematics, grade 8, Difference in State average score and the National Public average score

(273 out of a 0-500 scale) between jurisdictions, for all students [TOTAL]=All Students, 2022.

(The Nation's Report Card, 2022)

☐   Scores significantly higher than average

☐   Scores significantly below average

☐   Scores not significantly different than the average

■   Scores significantly higher than average

Figure 4

Reading, grade 8, Difference in State average score and the National Public average score (259 out of a 0-500 scale) between jurisdictions, for all students [TOTAL]=All Students, 2022. (The Nation's Report Card, 2022)

☐   Scores significantly higher than
☐   Scores significantly below
☐   Scores not significantly different than
■   Scores significantly higher than
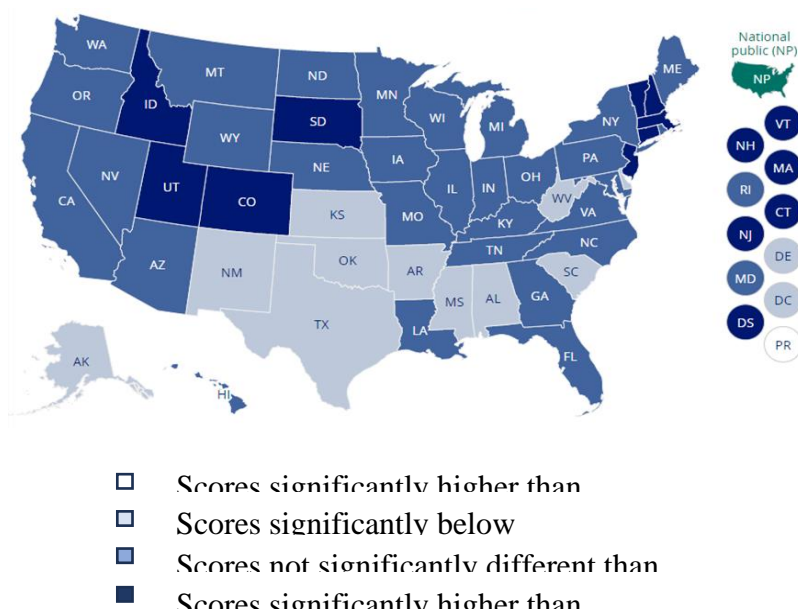
Based on Figures 1-4, four states that performed above the national public average in 2022 for all four measurements were New Jersey, Massachusetts, Utah, and New Hampshire (National Report Card, 2022). States that performed lower than the national public average in 2022 for all four measurements were New Mexico, Delaware, West Virginia, Alaska, and Oklahoma (National Report Card, 2022). States that performed around the national average for all four measurements included but are not limited to Missouri, Tennessee, North Carolina, and Arizona (National Report Card, 2022).

With an understanding of state rankings in student achievement based on test scores, the types of payment systems in the states should be evaluated. As seen in Figure 5, not all states play a role in deciding teacher pay rates because some payment systems are decided at the

district level rather than at the state level. As seen in Figure 5, some states allow districts to set

their salary schedules, some set the minimum salary a teacher must earn but leave other decisions

to the districts, and some states set a minimum salary schedule.

Figure 5

What role do states play in deciding teacher pay rates? (National Council on Teacher Quality,

2022)

☐ States set a minimum salary schedule.
☐ States set minimum salary, but Districts decide
■ States allow Districts to set salary schedules.
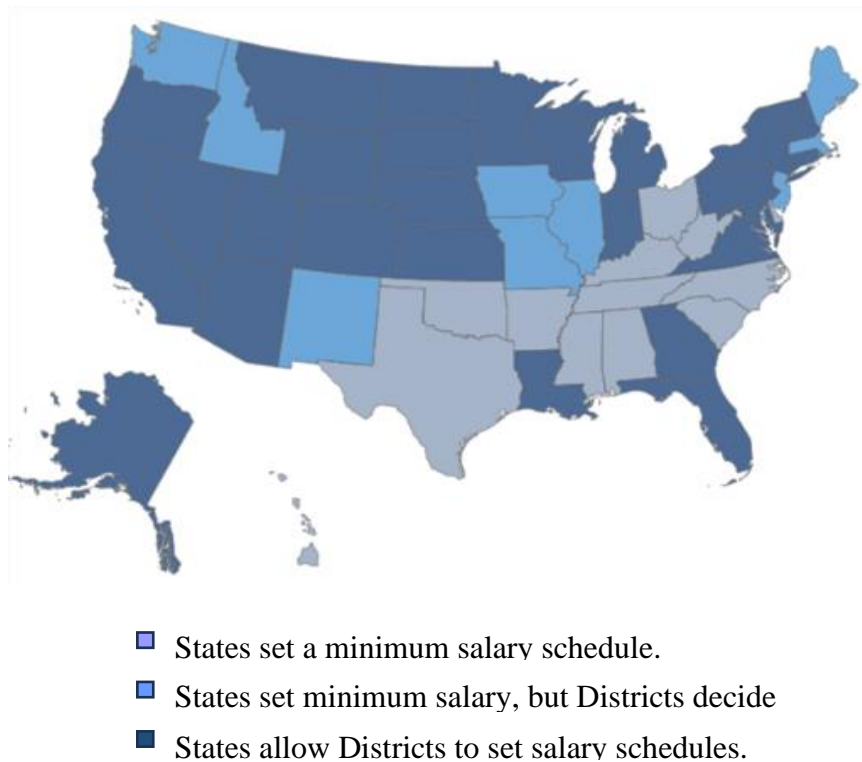
Of the higher performing states in student achievement, New Jersey and Massachusetts

set a state minimum salary but otherwise give autonomy to the districts while Utah and New

Hampshire both allow the districts to set their salary schedule completely as seen in Figure 5.

Figure 5 also shows that the average performing states in student achievement are more mixed

with two states, Tennessee and North Carolina, having the states set the salary schedule, while

Missouri only sets a state minimum salary and Arizona lets the districts decide their salary

schedules. The lower performing states, when referencing Figure 5, also had mixed approaches. Delaware and Oklahoma have state minimum salary schedules, Alaska gives the choice to the district, and New Mexico and Washington set a state minimum salary only. Whether states or districts decide the teacher salary schedule is significant. The average student achievement scores on a state level are more likely to be close to the national average. In individual districts, the distance is often greater. In some states, districts may choose different approaches that require more than the state minimum.

The requirements for using performance in determining pay are mixed among high, average, and low-performing states in student achievement. States that did not address whether merit pay was required, according to Figure 6, were New Jersey (performance: high), New Hampshire (high), North Carolina (average), New Mexico (low), Washington (low), and Alaska (low). Of the states chosen to review, only one state according to Figure 6, Utah (high), required performance to be used to determine teacher pay. The other six states, Massachusetts (high), Missouri (average), Tennessee (average), Arizona (average), Delaware (low), and Oklahoma (low), either encourage or allow merit pay to be used to determine teacher pay but do not require it. As seen in Figure 6, some states require the use of performance in determining pay, while others either encourage or allow performance to be used in determining pay, and the rest do not address whether performance is used or not.

Figure 6

What are states' requirements for use of teacher performance in determining pay? (National

Council on Teacher Quality, 2022)

   ☐ Does not address whether performance is

   ■ Encourages or allows performance to be used to

   ■ Requires performance to be used to
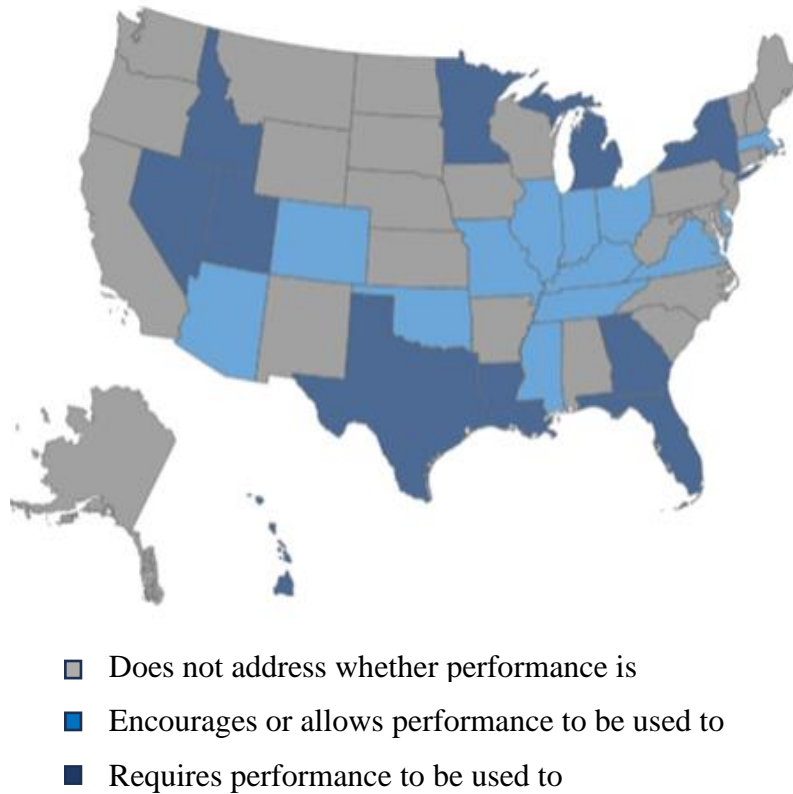
Policy Options

  Policy options include states requiring districts to use teacher performance to determine

pay, encouraging but not require it, continuing the status quo option of letting districts decide,

tying merit pay to other factors than student achievement, or even changing the definition of

student achievement. As one of the primary stakeholders, teachers should be part of the process

of developing their payment system.

  One policy option concerning these issues is for more states to require districts to use

teacher performance in determining pay. This would require clear criteria for evaluating teacher

performance. It is expected that these requirements will motivate teachers to do more and combat teacher shortages by rewarding quality teachers. There is an expectation that increased teacher motivation will improve the quality of educating teachers provide, produce higher test scores, and create more knowledgeable students.

Another policy option is for states to continue to encourage the use of performance in determining pay for teachers without requiring it. This option incentivizes districts to implement the merit pay system rather than force districts to implement a payment system that they may not desire. This gives flexibility within the state for districts who do not want a teacher merit pay system, while providing a foundation for districts who do want to explore a performance-based system. This could lead to innovation and creativity within how the education system operates.

A third policy option is for states to continue to not require merit pay and allow districts to decide individually if they want to implement merit pay. This is a status quo option, or a lack of doing anything, for many states. This policy option allows for flexibility at the district level to unique interests, opinions, and needs within each district and what would work best for them. This option's drawback is the potential lack of consistency among the state which will make it harder to determine areas of weakness in student achievement and other topics.

A less ambitious policy option is to tie merit pay to factors other than student achievement. One option for merit pay is to tie it to professional development. This could include taking courses, receiving certificates, and other activities that improve a teacher's quality and thus, outcomes. If a teacher is more professionally developed, the same results can be achieved by incentivizing them to improve rather than relying on their students to determine their pay.

Another less demanding policy option is to use student achievement to determine merit pay but change the definition of student achievement. This would mean incorporating more than just test scores in defining student success rates. Some definitions that could be included are graduation rates or attendance rates. This approach would help mitigate factors that may negatively affect student test scores that are unrelated to teacher performance. It, however, also has the potential to have unintended consequences like teachers implementing methods to incentivize students to attend class by making it less educational and more entertaining or increasing graduation rates by making classes easier.

It is important to note the impact of teachers on the creation of their payment system. Throughout all policy options it is important to involve more teachers in the creation of their payment system. If the goal is to incentivize teachers, then getting feedback from teachers is an important aspect of determining if a policy or a payment system will be effective.

Policy Recommendation

Merit pay systems can be a positive for teachers who are paid more for quality of work and for students who are achieving higher test scores and performing better. There are many valid concerns surrounding the decision of whether to implement a performance-based system, including discriminatory bias for different pay. Based on the combination of student achievement mapping and merit pay mapping, it is unclear whether, at a state level, merit pay benefits student test scores.

One mitigating factor to explain the lack of clarity could be too few states requiring merit pay to be used as a factor in determining pay. Even though the differences held no quantitative differences, rapid changes of payment systems may remit unintended consequences, not captured

within the paper's scope. Furthermore, only numerical educational outcomes were compared. The emotional outcomes were not measured.

By letting the districts have greater control over the payment system than the state, there is hope that this will have a better chance of teachers being able to express what will motivate them, at the cost, potentially, to student achievement. Because of a lack of clarity, states should continue to let the districts determine for themselves if they want to implement performance as a factor in determining teacher pay. Furthermore, they should provide support for both the districts opting into and abstaining from implementing a merit pay system. While arguments for a fourth payment movement are persuasive, merit pay bears resemblance to the second payment movement and lacks enough evidence of student success enhancement to be established as a new nation-wide movement.

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