

Teacher Labor Markets, Teaching Effectiveness and the Implications for Teacher Compensation

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Over two decades of research on teachers and the teacher labor market have made two empirical truths abundantly clear. First, the way school districts pay teachers fails to send key signals to the teacher labor market about schools' hiring needs. Second, teachers have significant and varied impacts on student outcomes. The related disconnect between teacher pay, school hiring needs, and teacher quality creates a host of issues that make it harder for schools to ensure that all students have access to effective teachers. Given this, we recommend states and districts restructure teacher compensation to differentiate by subject/specialty area, school type, and performance. In this memo, we argue that recent evidence underscores the need for differentiated compensation in schools and—crucially—highlights factors that can help it succeed.

Differences in School Hiring Needs

Teacher staffing challenges (often referred to as “teacher shortages”) have dominated the news during the COVID-19 pandemic. But staffing challenges are not new. Schools have long had a harder time staffing STEM and special education teaching positions than elementary education positions (Cowan et al., 2015). Schools also struggle to staff positions if they serve higher proportions of students of color and/or students from low-income households. Schools serving these groups of students tend to have higher rates of teacher attrition (Goldhaber and Theobald, 2022; Hanushek et al., 2004), more job vacancies (Goldhaber et al., 2023), and thinner applicant pools for open positions (James et al., 2023). No matter the measure, there is ample evidence that teacher quality is inequitably distributed across students (Goldhaber et al., 2015; Lankford et al., 2002). Although these problematic patterns have been documented for decades, public education has continually failed to address them systematically.

Teachers' Impacts on Students Vary, But Aren't Well-Captured by Credentials

A second hallmark of two-plus decades of research on teachers is that teachers have varied impacts on student test scores (e.g., Aaronson et al., 2007; Rivkin et al., 2005) as well as non-test outcomes, like attendance (e.g., Backes et al., 2023; Jackson, 2018; Kraft, 2019). These differences in teacher impacts have been found to have important long-run effects on students' college and labor market outcomes (Chetty et al., 2014). The challenge for school districts is that teachers who appear to be similar based on readily observable characteristics (e.g., experience, degree level, licensure status) often still have quite different impacts on students. Although we know teachers tend to become more effective during their early careers, it is difficult to determine who will be an effective teacher prior to seeing how they perform in the classroom (Gordon et al., 2006); indeed, research finds that the best predictor of a future teacher's performance is that teacher's prior impact on students (Atteberry et al., 2015).

The Way We Currently Pay Teachers Ignores These Differences

The prevailing pay structure for public school teachers—the single salary schedule—fails to recognize that some positions are harder to fill than others, and that some teachers are more effective than others. The uniform salary schedule is often justified by appealing to

egalitarianism, in that it treats every teacher “the same”. However, the absence of differentiation in pay cannot erase the very real differentiation in work environments in schools and in pay opportunities outside of teaching. By ignoring these differences, the uniform schedule may be seen as egalitarian from a teacher perspective, but it creates inequities for students and often the *wrong* incentives. For example, if certain schools are more challenging places to work because student and family needs are greater, then paying teachers the same no matter where they work incentivizes teachers to move toward schools where students and families have *less* need. If teachers with a background in science and engineering have higher wage opportunities outside of teaching, then a uniform salary schedule *discourages* teachers with such a background from entering teaching.

Teacher pay is typically not differentiated based on subject, school working conditions, or performance. Ignoring these differences would not matter much if teachers failed to respond to financial incentives. But there is abundant evidence that—like employees in other sectors of the economy—teachers do respond to incentives. Research on incentives to *address staffing challenges*, for example, finds that extra pay for hard-to-staff subjects and schools influences the workforce decisions of teachers and increases the likelihood of recruiting or retaining teachers in high-needs areas (e.g., Clotfelter et al., 2008; Cowan and Goldhaber, 2018; Feng and Sass, 2018; Morgan et al., 2023; Theobald et al., 2023). Indeed, the call for raising pay to deal with COVID teacher shortages presumes that prospective teachers respond to incentives.

Evidence on how teachers respond to incentives for *performance* presents a more complicated picture. Many people conclude that the national push for performance incentives and evaluation reform during the Obama administration was a failure. Indeed, the best evidence suggests these reforms failed to improve teacher workforce quality nationwide (Bleiberg et al., 2021; Kraft et al., 2020). But a national look at these reforms masks striking examples of success at the district level, where pay and evaluation reforms in some cases improved student achievement by changing who was in the workforce and how productive they were (Biasi, 2021).

For example, research suggests the longstanding pay and evaluation reform in Washington, DC schools (known as IMPACT) significantly improved teacher performance in the district for over a decade (Dee and Wyckoff, 2015; Dee et al., 2021). Evidence from a recent pay and evaluation reform in the Dallas Independent School District provides further evidence that well-designed pay reforms can improve teacher performance and student achievement (Hanushek et al., 2023).

The Path Forward

For effective teacher compensation policy, the direction forward is clear: states and districts should increase compensation in subject areas and schools with acute staffing needs and these salary increases should be conditioned on evidence of teacher effectiveness. In a world of constrained resources, such targeted salary increases will be both more feasible and more effective than across-the-board pay increases. By contrast, broad-based pay increases end up being spread too thin and do little to encourage prospective teachers to pursue high-needs areas or address equity concerns about the extent to which effective teachers are fairly distributed across students (Dee and Goldhaber, 2017). To address shortages of high-quality teachers that disproportionately affect some schools and subjects, policy should provide targeted pay increases to effective teachers working in high-poverty schools and shortage subjects.

Reforming pay to recognize different staffing needs is relatively straightforward. But linking pay to teacher performance is more complex, especially regarding what is being

rewarded. For example, it matters whether the source of variation in performance is effort or talent and accumulated skills. If the primary driver of performance is effort, then it only makes sense to reward based on the most recent performance. If the underlying source is talent/skill, then systems could make longer-term commitments based on several years of performance. Systems that reward teachers for only the most recent year gains of students have generally not found positive impacts (e.g., Marsh et al., 2011; Springer et al., 2010, 2012; Yuan et al., 2013)—perhaps because the primary driver of difference in teacher performance is talent/accumulated skill, rather than effort alone.

On the other hand, performance pay programs linked to well-implemented and rigorous teacher evaluation—which make longer-term commitments to teachers based on demonstrated skill and a track record of positive impacts on students—have been shown to be effective. For example, in Washington DC’s IMPACT program, incentives led to more top teachers staying while more low-performing teachers left (both voluntarily and involuntarily). Designing and implementing performance pay tied to differentiated teacher evaluation is challenging and time consuming, but feasible.

Incentivizing performance has implications that go beyond compensation reform. For example, performance-focused reforms, like those in Washington, DC, need to be part of a larger set of human resource management reforms that rethink how schools monitor, support, evaluate, and pay teachers. One reason that the teacher policy reforms of the Obama era did not meaningfully change outcomes in many districts is that school systems failed to align all the components of their human resource management systems (Goldhaber and DeArmond, 2023). In most states, evaluation systems adopted in the 2010s failed to effectively distinguish teachers based on performance—everyone received similar ratings (Kraft and Gilmour, 2017). Without capturing meaningful variation in performance, evaluations cannot inform decisions about development or pay, let alone decisions about teacher training and preparation (Goldhaber, 2019).

Information about a teacher’s skill and performance is most valuable early in his or her career, when teacher turnover is highest and when teachers are most sensitive to differences in salary (e.g., Hendricks, 2014, 2015; Johnston, 2022). If schools know earlier who their highest performing teachers are, they can retain them by offering them greater pay and promotion opportunities. It’s also the time when it would be least painful for teachers and supervisors to make high-stakes separation decisions. But that requires investment—in pulling together a teacher’s track record of impacts on students, and in more frequent classroom observations to meaningfully differentiate performance. Accordingly, school districts should focus their limited resources on teacher evaluation that is tied to appropriate incentives during the first five years of a teacher’s career.

A Role for States

School districts need local discretion when it comes to managing their teacher workforces. What works in a labor market with lots of available, skilled workers may not work where there is less teacher talent available. But states also have an important role to play. States can act in three ways: by providing incentives for district actions, by setting requirements for districts, and by providing guidance and information.

State Incentives. Districts can be incentivized to engage in reform by making bonuses immediately available to teachers in high-poverty schools and shortage subjects, with the condition that districts accepting these bonuses commit to implementing locally designed, state-

approved evaluation systems that differentiate pay by measured teacher effectiveness. Another example comes from the school finance reforms of HB3 in Texas, which incentivized performance pay. Texas provides grants to individual districts if they have an outcome-based teacher evaluation system and if they use it to provide financial incentives for effective teachers to move to schools serving disadvantaged populations. This incentive fund is designed to build on successful strategies implemented in Dallas Independent School District without mandating specific approaches that might not work in other districts.

State Requirements. States can require districts to collect evidence about teachers' impacts on student learning and other outcomes to inform objective measures of teacher effectiveness. Because some individual school systems may not have the capacity or political will to measure teacher quality or benchmark themselves against other districts, states should use this information to provide objective evidence on teacher performance. States can also require districts to consider performance for professional advancement, by redesigning their licensure systems to include performance-based milestones (e.g., through a tiered licensure system). Given that schools learn a lot more about a teacher's effectiveness during the first years on the job, states may have a role to play in delaying full licensure until after the first several years of teaching. For instance, states could provide promotion opportunities and career pathways to teachers with strong early career track records. They could require that teachers with poor early career track records be removed so they do not continue to harm students.

State Guidance and Support. The design and implementation of human resource policies that satisfy state requirements is a district responsibility, but many districts may lack the capacity, experience, or political will to build well-designed and well-implemented systems. States can support the design and implementation of teacher evaluation by sharing best practices and providing support tailored to district needs. Research suggests that, when objective information about teacher performance is available, principals use that information when making decisions (e.g., Loeb et al., 2015; Rockoff et al., 2012). Having high-quality performance information is especially important given how difficult it is to determine who will be an effective teacher before they start teaching. State support for district evaluation systems can help ensure that district reforms function as intended and are not in name only. For example, if the state uses its longitudinal data to measure teachers' student achievement gains and if districts establish their own metrics for assessing classroom performance, a state could verify that the ratings provided during classroom observation are correlated with the achievement gain measures. Such oversight is possible (e.g., Glazerman et al., 2011), but it requires leadership, commitment, and strategic purpose.

Summary

For too long, teacher compensation and related human resources policies have contributed to public school staffing challenges, which, in turn, have contributed to declining student performance in many schools. Effective teachers need to be well-compensated. In many schools, they are not. To be most effective, states should support school districts in creating pay systems that provide teachers with financial incentives so that our lowest-performing schools are staffed with our most effective teachers.

References

- Aaronson, D., Barrow, L., & Sander, W. (2007). Teachers and student achievement in the Chicago public high schools. *Journal of Labor Economics*, 25(1), 95–135. <https://doi.org/10.1086/508733>
- Atteberry, A., Loeb, S., & Wyckoff, J. (2015). Do first impressions matter? Predicting early career teacher effectiveness. *AERA Open*, 1(4), 233285841560783. <https://doi.org/10.1177/2332858415607834>.
- Backes, B., Cowan, J., Goldhaber, D., & Theobald, R. (2023). How to Measure a Teacher: The Influence of Test and Nontest Value-Added on Long-Run Student Outcomes. Working Paper 270-0423-2. *National Center for Analysis of Longitudinal Data in Education Research (CALDER)*.
- Biasi, B. (2021). The labor market for teachers under different pay schemes. *American Economic Journal: Economic Policy*, 13(3), 63-102.
- Bleiberg, J., Brunner, E., Harbatkin, E., Kraft, M. A., & Springer, M. G. (2021). *The effect of teacher evaluation on achievement and attainment: Evidence from statewide reforms* (EdWorkingPaper No. 21-496). Annenberg Institute at Brown University. <https://www.edworkingpapers.com/ai21-496>
- Chetty, R., Friedman, J. N., & Rockoff, J. E. (2014). Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood. *American Economic Review*, 104(9), 2633-79.
- Clotfelter, C. T., Glennie, E. J., Ladd, H. F., & Vigdor, J. L. (2008). Would higher salaries keep teachers in high-poverty schools? Evidence from a policy intervention in North Carolina. *Journal of Public Economics*, 92(5-6), 1352-1370.
- Cowan, J., & Goldhaber, D. (2018). Do bonuses affect teacher staffing and student achievement in high poverty schools? Evidence from an incentive for national board certified teachers in Washington State. *Economics of Education Review*, 65, 138–152.
- Dee, T. S., & Goldhaber, D. (2017). Understanding and addressing teacher shortages in the United States. *The Hamilton Project, Brookings Institution*.
- Dee, T. S., James, J., & Wyckoff, J. (2021). Is effective teacher evaluation sustainable? Evidence from District of Columbia Public Schools. *Education Finance and Policy* 16 (2): 313–346. doi: https://doi.org/10.1162/edfp_a_00303
- Dee, T. S. & Wyckoff, J. (2015). “Incentives, Selection, and Teacher Performance: Evidence from IMPACT.” *Journal of Policy Analysis and Management* 34 (2): 267–97.
- Feng, L., & Sass, T. R. (2018). The impact of incentives to recruit and retain teachers in “hard-to-staff” subjects. *Journal of Policy Analysis and Management*, 37(1), 112– 135.
- Glazerman, S., Goldhaber, D., Loeb, S., Raudenbush, S., Staiger, D.O. & Whitehurst, G.J. 2011. *Passing muster: Evaluating teacher evaluation systems*, Washington, D.C: Brown Center on Education Policy, Brookings Institution.
- Goldhaber, D. (2019). Evidence-Based Teacher Preparation: Policy Context and What We Know. *Journal of Teacher Education*, 70(2), 90–101. <https://doi.org/10.1177/0022487118800712>.

- Goldhaber, D., Lavery, L., & Theobald, R. (2015). Uneven playing field? Assessing the teacher quality gap between advantaged and disadvantaged students. *Educational Researcher*, 44(5), 293–307. <https://doi.org/10.3102/0013189X15592622>
- Goldhaber, D., & Theobald, R. (2022). Teacher Attrition and Mobility in the Pandemic. *Educational Evaluation and Policy Analysis*, 0(0). <https://doi.org/10.3102/01623737221139285>.
- Goldhaber, D., Falken, G., and Theobald, R. (2023). What Do Teacher Job Postings Tell Us about School Hiring Needs and Equity?. CALDER Working Paper No. 282-0323
- Goldhaber, D. & DeArmond, M. (2023). What Does Empirical Research Say About Federal Policy From NCLB to ESSA? https://www.uschamberfoundation.org/sites/default/files/USCCF_FutureOfDataInK12Education_ResearchReport2.pdf
- Gordon, R. J., Kane, T. J., and Staiger, D. (2006). “Identifying Effective Teachers Using Performance on the Job,” (Washington, D.C., The Hamilton Project, 2006).
- Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2004). Why Public Schools Lose Teachers. *The Journal of Human Resources*, 39(2), 326–354. <https://doi.org/10.2307/3559017>
- Hanushek, E. A., Luo, J., Morgan, A., Nguyen, M., Ost, B., Rivkin, S., and Shakeel, A. (2023). The Effects of Comprehensive Educator Evaluation and Pay Reform on Achievement. CALDER Working Paper No. 281-0323.
- Hendricks, M. D. (2014). Does it pay to pay teachers more? Evidence from Texas. *Journal of Public Economics*, 109, 50-63.
- Hendricks, M. D. (2015). Towards an optimal teacher salary schedule: Designing base salary to attract and retain effective teachers. *Economics of Education Review*, 47, 143-167.
- Jackson, C. K. (2018). What do test scores miss? The importance of teacher effects on non-test score outcomes. *Journal of Political Economy*, 126(5), 2072–2107. <https://doi.org/10.1086/699018>
- James, J., Kraft, M. A., & Papay, J. P. (2023). Local supply, temporal dynamics, and unrealized potential in teacher hiring. *Journal of Policy Analysis and Management*, 00, 1–35. <https://doi.org/10.1002/pam.22496>
- Johnston, A (2022). Preferences, Selection, and the Structure of Teacher Pay. IZA Discussion Paper No. 14831. <http://dx.doi.org/10.2139/ssrn.4114370>
- Kraft, M. A. (2019). Teacher effects on complex cognitive skills and social-emotional competencies. *Journal of Human Resources*, 54(1), 1–36. <https://doi.org/10.3368/jhr.54.1.0916.8265R3>
- Kraft, M. A., & Gilmour, A. F. (2017). Revisiting *The Widget Effect*: Teacher evaluation reforms and the distribution of teacher effectiveness. *Educational Researcher*, 46(5), 234–249. <https://doi.org/10.3102/0013189X17718797>
- Kraft, M. A., Brunner, E. J., Dougherty, S. M., & Schwegman, D. J. (2020). Teacher accountability reforms and the supply and quality of new teachers. *Journal of Public Economics*, 188, 104212.

- Lankford, H., Loeb, S., & Wyckoff, J. (2002). Teacher Sorting and the Plight of Urban Schools: A Descriptive Analysis. *Educational Evaluation and Policy Analysis*, 24(1), 37–62. <https://doi.org/10.3102/01623737024001037>
- Loeb, S., Miller, L. C., & Wyckoff, J. (2015). Performance Screens for School Improvement: The Case of Teacher Tenure Reform in New York City. *Educational Researcher*, 44(4), 199–212. <http://www.jstor.org/stable/24571514>
- Marsh, J. A., Springer, M. G., McCaffrey, D. F., Yuan, K., & Epstein, S. (2011). *A big apple for educators: New York City's experiment with the schoolwide performance bonuses*. Rand Corporation.
- Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). Teachers, schools, and academic achievement. *Econometrica*, 73(2), 417–458. <https://doi.org/10.1111/j.1468-0262.2005.00584.x>
- Rockoff, J. E., Staiger, D., Kane T.J., and Taylor, E.S. (2012). "Information and Employee Evaluation: Evidence from a Randomized Intervention in Public Schools." *American Economic Review*, 102 (7): 3184-3213.
- Springer, M. G., Pane, J. F., Le, V.-N., McCaffrey, D. F., Burns, S. F., Hamilton, L. S., & Stecher, B. (2012). Team Pay for Performance: Experimental Evidence From the Round Rock Pilot Project on Team Incentives. *Educational Evaluation and Policy Analysis*, 34(4), 367–390. <https://doi.org/10.3102/0162373712439094>
- Springer, M. G., Hamilton, L., McCaffrey, D. F., Ballou, D., Le, V. N., Pepper, M., ... & Stecher, B. M. (2010). Teacher pay for performance: Experimental evidence from the Project on Incentives in Teaching. *National Center on Performance Incentives*.
- Theobald, R., Xu, Z., Gilmour, A. F., Lachlan-Hache, L., Bettini, E., & Jones, N. (2023). The impact of a \$10,000 bonus on special education teacher shortages in Hawai'i. CALDER Working Paper 290-0823.
- Yuan, K., Le, V.-N., McCaffrey, D. F., Marsh, J. A., Hamilton, L. S., Stecher, B. M., & Springer, M. G. (2013). Incentive Pay Programs Do Not Affect Teacher Motivation or Reported Practices: Results From Three Randomized Studies. *Educational Evaluation and Policy Analysis*, 35(1), 3–22. <https://doi.org/10.3102/0162373712462625>