

Access to High-Quality Instruction: Assessing the Distribution of Teacher and Principal Quality in Texas

David S. Knight, Mark W. Olofson, & Shenshen Yang

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What We Studied

This policy brief presents evidence that historically underserved students in Texas are less likely to be assigned to the most qualified and effective educators. Teachers and principals are inequitably distributed at all levels of the education system – across school districts, across schools within the same district, and (for teachers) even across classrooms in the same school. The results are consistent for five indicators of educator quality, including experience level, certification status, certification exam score, undergraduate degree selectivity, and (for teachers) a value-added measure of effectiveness. Moreover, educator quality gaps have existed in Texas for over 20 years, but have increased in recent years following the economic recovery from the Great Recession, which led to increased retirements and greater mobility in teacher and principal labor markets.

Prior research and policy efforts have focused on teacher and principal sorting across schools in the same district, and districts' employee transfer provisions. Yet this study demonstrates that educator quality gaps are caused primarily by sorting of teachers and principals across school districts, and in particular, across districts in the same labor market. Differences in educator quality across labor markets, which in Texas include an average of 30 districts, are insignificant by most measures. In other words, educator quality is evenly spread across labor markets in the state, but inequitably distributed across districts in those labor markets. These results suggest districts can attract more qualified and effective educators from neighboring districts within their own labor market, rather than recruiting from outside their region or the state.

Policymakers point to education as a mechanism for reducing inequality. Yet, data show that low-income students and students of color attend schools that receive lower funding levels and offer less educational opportunity compared to their more privileged peers. Despite legislative reforms, most K-12 state school finance systems still allocate funding inequitably across school districts. Inequitable funding systems contribute to unequal educational opportunity in part because lower funding levels make attracting and retaining high-quality educators more difficult. A growing area of research explores how teacher and principal quality – defined and measured in various ways – are distributed across student groups.

In addition to inequitable funding systems, these studies identify an “educator quality gap,” in which historically underserved students are more likely to be assigned to teachers and principals with lower qualifications and, for teachers, lower value-added measures of effectiveness.

The purpose of this policy brief is to provide background on research on educator quality gaps, describe the findings of a study of educator quality gaps in Texas, and provide recommendations for policymakers aiming to improve access to high-quality teachers and principals for historically underserved students.

Studies of teacher and principal quality gaps define educator quality based on years of experience, certification status and certification exam scores, the type of undergraduate institution, and for teachers, value-added measures of effectiveness. Despite the mounting research on the nature of educator quality gaps, several policy-relevant issues persist:

- There is not consensus around the extent to which teacher quality gaps identified in some contexts may exist in other contexts. While several studies identify teacher quality gaps across a range of quality measures and indicators of student disadvantage, studies from other contexts conclude that teacher quality gaps are small and educationally insignificant. Texas provides a useful case to explore teacher quality gaps across a range of contexts.
- Studies are inconclusive about whether educator quality gaps are generally larger within or across school districts. Analyses based on data from North Carolina show that teacher quality gaps are largest within school districts, whereas results from Washington State identify larger gaps across districts (compared to within). Other results combine large urban districts from around the country and are therefore unable to make comparisons of teacher quality across districts in the same state. How teacher quality is sorted across and within districts has implications for the appropriate policy responses. Within-district sorting suggests that school districts may need to reform educator hiring, placement, retention, and transfer provisions. Across-district sorting suggests that policy reforms may need to target district-level recruitment and retention issues including teacher compensation.
- Few studies examine changes in educator quality gaps over time. Goldhaber, Quince and Theobald (2016) is one of the few studies to examine teacher quality gaps over an extended period of time. The authors compare teacher quality gaps in North Carolina and Washington State, but are unable to reconcile divergent findings about the source of teacher quality gaps. Texas provides a unique opportunity to reconcile the divergent findings found in Goldhaber et al. (2016) because Texas includes characteristics of both states, in particular, a large number of both urban and rural districts and a wide variation in district size.
- Previous research explores teacher and principal quality gaps independently. Prior work has not examined whether teacher and principal quality gaps are correlated across time or whether districts with large teacher quality gaps also have large principal quality gaps.

How We Analyzed the Data

This policy brief describes the findings of a two-year research project that explores each of these issues. The study focuses on the following two research questions:

1. To what extent are historically underserved students in Texas disproportionately assigned to lower-quality teachers and principals in the state of Texas and how have these trends changed over time from 1995-96 to the present?
2. What proportion of educator quality gaps are caused by sorting across classrooms in the same school (for teachers), across schools in the same district, across districts within the same labor market, and across labor markets in the state of Texas?

The analyses draw on a statewide longitudinal database made available through the University of Texas at Austin Education Research Center. The data include demographic information for all K-12 students, teachers, and principals in Texas for school years 1995-96 forward. Student data include scores on statewide standardized exams for grades 3-8 in math and English language arts and end-of-course exams for upper grades. Employee data include information about school assignment, years of experience, undergraduate institution, certification status, and scores on certification exams. For school years 2011-12 forward, individual students are linked to teachers, allowing for the calculation of value-added measures of effectiveness.

What We Discovered

1. **Teacher quality gaps in Texas are statistically and educationally significant. The greatest disparities in students' access to high-quality teachers are in the upper grades, in large school districts, and in urban school districts.** As shown in the first row of Table 1, 17.8 percent of low-income grade four students are assigned to a novice teacher, compared to 13.4 percent of non-low-income students, creating a teacher quality

gap (based on experience) of 4.4 percentage points (Columns 1-3). Low-income students are more likely to be assigned to a less effective teacher (as measured by a teacher’s prior year value-added score), and a less qualified teacher, as measured by whether the teacher (a) holds an emergency certification, (b) scored in the bottom decile on the certification exam, and (c) received their undergraduate degree from a non-competitive undergraduate institution, as measured by Barron’s ranking of admissions selectivity. The bottom panel of Table 1 shows these results are consistent for students of color. Results also show that low-income students and students of color are less likely to be assigned to veteran teachers, highly effective teachers, and teachers who score in the highest decile on their certification exam. Other analyses show that teacher quality gaps are larger in upper elementary, middle, and high school grades, especially Algebra I, in urban districts, and among the 10 largest districts in the state, which account for 20% of all students statewide.

- Teacher quality gaps are caused by sorting of teachers across districts within the same labor market.** The right side of Table 1 shows the source of the teacher quality gap. In most cases, the majority of the teacher quality gaps are caused by sorting of teachers across districts in the same labor market. For example, 65% of the 4.4 percentage point teacher experience gap for grade 4 FRL students is due to sorting across districts in the same labor market, whereas sorting across labor markets actually reduces the teacher experience gap. In other words, labor markets with more low-income students have fewer novice teachers. Table 1 also shows that results are similar for less effective teachers: sorting primarily operates across districts in the same labor market (47%), while a slightly smaller proportion of the gap (38%) is due to sorting across schools within the same district. Only 10% of the value-added-based teacher quality gap is due to sorting across labor markets. As before, results are similar for highly qualified or effective teachers. These results imply that the most and least effective teachers are somewhat evenly spread across labor markets, but inequitably distributed across districts in the same labor market.

TABLE 1
Teacher quality gaps and decomposition for grade 4 students, 2015-16

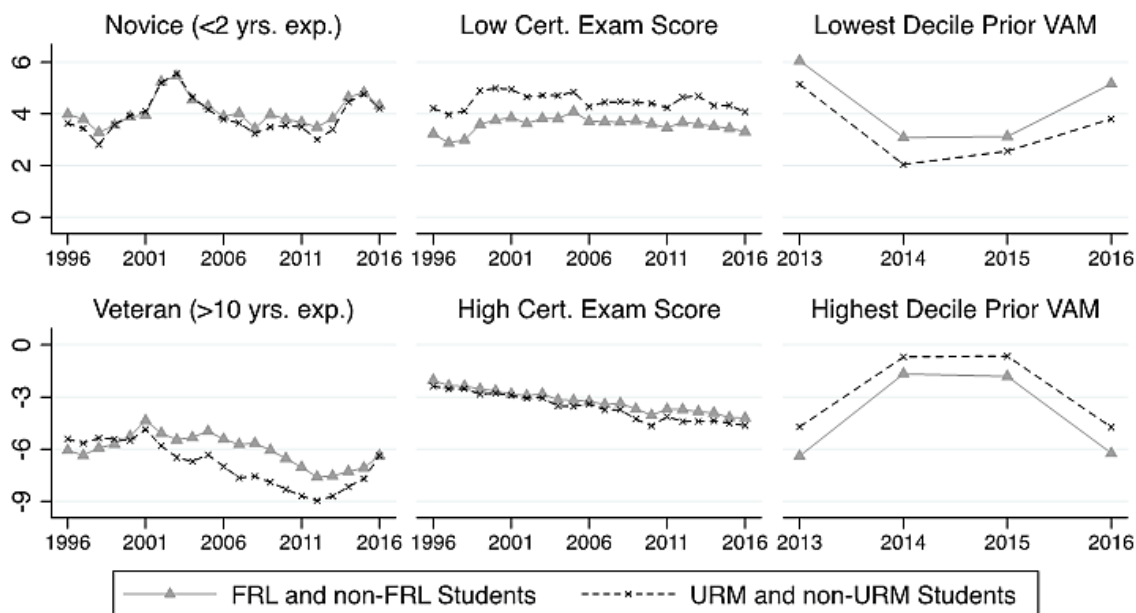
	Statewide Gap			Decomposition of Difference			
	Disadv.	Non-Disadv.	Diff	Labor Market	District	School	Classroom
	Free / Reduced Price Lunch Status						
Novice teacher (< 2 years exp.)	17.80	13.40	4.397*	-0.754 -17%	2.863* 65%	2.010* 46%	0.278* 6%
Lowest decile VAM in prior yr.	12.02	6.87	5.152*	0.530* 10%	2.409* 47%	1.983* 38%	0.230 4%
Emergency certification	1.30	0.75	0.547*	0.080 15%	0.257* 47%	0.231* 42%	-0.021 -4%
Lowest decile teacher certification exam	11.18	7.95	3.238*	0.970* 30%	1.238* 38%	0.876* 27%	0.154 5%
Lowest college competitiveness	6.33	4.05	2.285*	1.212* 53%	0.583* 26%	0.288* 13%	0.202* 9%
	Underrepresented Minority						
Novice teacher (< 2 years exp.)	17.46	13.25	4.208*	-1.250 -30%	3.142* 75%	2.160* 51%	0.156 4%
Lowest decile VAM in prior yr.	11.19	7.44	3.748*	0.243 6%	1.639* 44%	1.906* 51%	-0.040 -1%
Emergency certification	1.28	0.69	0.590*	0.160* 27%	0.297* 50%	0.150* 25%	-0.017 -2%
Lowest decile TExES exam	11.23	7.21	4.023*	1.437* 36%	1.383* 34%	1.130* 28%	0.073 2%
Lowest college competitiveness	6.66	2.91	3.753*	2.759* 74%	0.628* 17%	0.302* 8%	0.064* 2%

Note. College competitiveness is based on Barron’s rankings of admissions competitiveness. VAM in prior year refers to a teacher’s value-added measure of effectiveness from the prior year.

3. **Across-district sorting as the primary cause of teacher quality gaps may result from larger districts facing greater competition from smaller districts in the same labor market.** In the 10 largest districts in Texas, teacher quality gaps are caused primarily by within-district sorting; however, when we include the (much smaller) surrounding districts in the same labor market, the teacher quality gap is evenly split between within- and across-district sorting. Among rural and smaller districts, teacher quality gaps are smaller and result primarily from sorting across districts, rather than across schools in the same district. These findings suggest that the divergent findings in Goldhaber et al. (2016) – larger within-district teacher quality gaps in North Carolina, compared to Washington State – may result not only from larger average districts in North Carolina, but also from the lack of smaller districts in North Carolina, which could serve as competitors in the teacher labor market.ⁱ
4. **Teacher quality gaps are relatively stable over time.** As shown in Figure 1, teacher quality gaps are highly correlated across student subgroups and are stable over time. Teacher quality gaps based on exposure to the highest and lowest value-added measures approached zero during the 2013-14 and 2014-15 school years but returned to the prior level in 2015-16.

FIGURE 1

Changes in the teacher quality gap over time, grade 4 students, 1995-96 to 2015-16



Note. The graphs show teacher quality gaps measured by differences in percentage points in the percent of FRL and URM students assigned to teachers with varying qualifications. Value-added model (VAM) estimates of teacher effectiveness are available only for 2011-12 to 2015-16; prior VAM refers to the teacher's VAM from the prior year.

5. **Principal quality gaps are smaller than teacher quality gaps, but historically underserved students are still more likely to attend schools with less experienced principals and principals with lower observable qualifications.** Across the state, 21% of principals are in their first or second year as a principal and 41% are in their first two years in their current school. As shown in Table 2, low-income students and students of color are significantly more likely to attend a school with a principal in their first or second year as a principal or in their first two years as a principal at that school. Row 1 of Table 2 shows that 23.3% of FRL students attend a school with a novice principal, compared to 20.5% of non-FRL students, a difference of 2.79 percentage points. Results are similar for students of color: 22.9% of underrepresented minority (URM) students have a novice principal, compared to 20.8% of non-URM students, a difference of 2.14 percentage points. Principal experience gaps are larger when considering school specific experience. The gaps for low-income students and students of color are 4.65 and 5.16 percentage points, respectively. The results suggest that low-income

students and students of color are 12% and 14% more likely to attend a school with a principal in their first two years in that school, respectively. As shown in the bottom two rows of Table 2, these students are also more likely to attend a school with a principal who (a) received an undergraduate degree from a non-competitive or least competitive undergraduate institution, and (b) scored in the bottom decile on their principal certification exam, among those who took the principal exam the same year.

TABLE 2

Principal quality gaps based on years of experience, competitiveness of the undergraduate institution, and certification exam score, for low-income students and students of color, 2014-15

	Free/Reduced Price Lunch (FRL)					Underrepresented Minority (URM)				
	Statewide gap			Decomp.		Statewide gap			Decomp.	
	FRL	non-FRL	Diff.	Dist.	Sch.	URM	non-URM	Diff.	Dist.	Sch.
Novice (< 2 years exp.)	23.3	20.5	2.79*	0.77*	2.02*	22.9	20.8	2.14*	0.94*	1.20*
Novice in specific sch.	42.4	37.7	4.65*	3.53*	1.12*	42.1	36.9	5.16*	4.00*	1.16*
Low college compet. (noncom. / least com.)	38.5	33.9	4.58*	3.27*	1.31*	39.6	31.0	8.60*	6.96*	1.64*
Lowest crt. exam score	15.5	10.9	4.63*	3.72*	0.91*	15.4	10.0	5.41*	4.07*	1.34*

Note. Decomp. refers to the decomposition of the total gap into principal quality gaps across districts (dist.) and across schools within the same district (sch.). “Lowest college compet.” refers to principals who attended undergraduate institutions in which admission is rated non-competitive or least competitive; “Lowest crt. exam score” refers to principals who scored in the lowest decile on the principal certification exam, among those who took the same exam the same year.

6. **Principal quality gaps are caused by a mix of within- and across-district sorting.** Table 2 shows that for most measures of the principal quality gap, the across-district gaps are larger than across-school gaps. However, Figure 2 shows that this relationship has changed over time. Most of the fluctuations in the principal quality gap are caused by sorting across, rather than within, school districts. In contrast, within-district principal sorting is relatively stable over time.

Principal quality gaps in Texas have fluctuated over time. Figure 2 shows that beginning in the late 2000s, principal experience gaps decreased, especially for differences in principals’ school-specific experience. This may result from delayed retirements following the Great Recession, which reduces vacancies in low-poverty suburban areas that may be attractive to mid-career principal working in high-poverty schools. Beginning in 2010, principal quality gaps have been generally increasing across a range of quality measures. Teacher quality gaps based on experience follow similar trends (Figure 1).

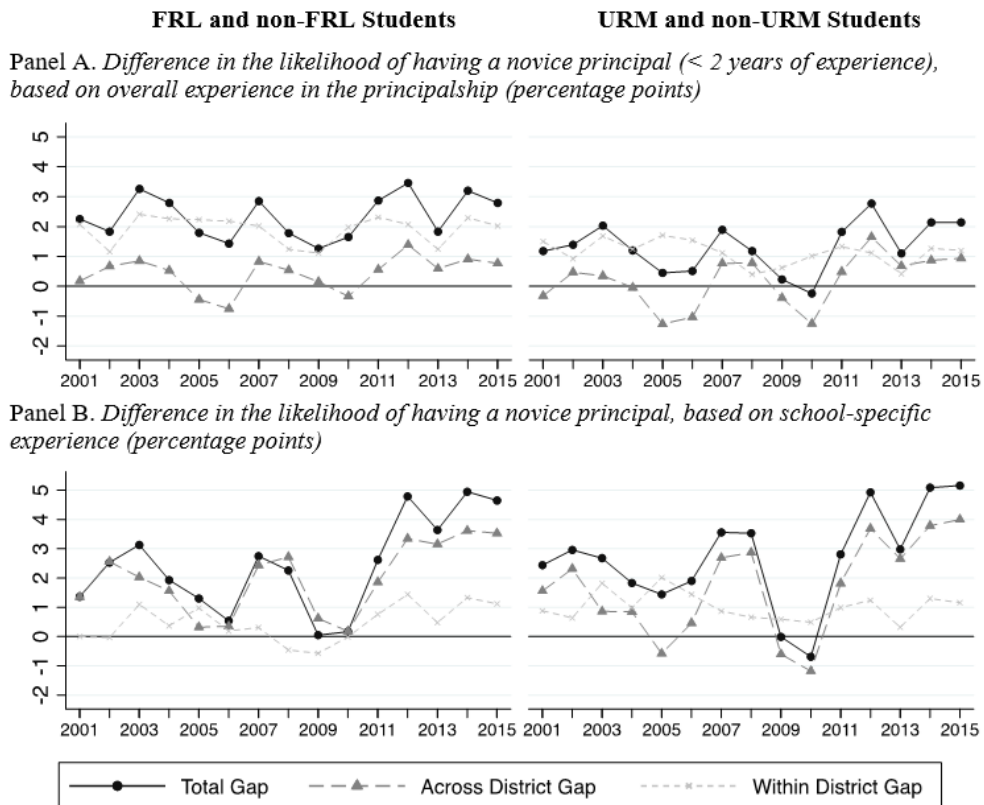
Policy Recommendations

Federal Policy Recommendations

Include regulations in the Every Student Succeeds Act (ESSA) that encourage districts to address educator quality gaps. As part of the Department of Education’s (ED) rulemaking process that followed the passing of ESSA in December 2015, ED initially required districts that were deemed low-performing under state accountability plans to measure and address disparities in both teacher salary spending and teacher experience across high- and low- poverty schools. This policy was removed under Secretary DeVos and ESSA now excludes any requirement for districts to address resource disparities across schools. Districts still face the same obligation to provide equal staffing ratios between Title I (high-poverty) schools and non-Title I schools; however, this policy does not address gaps in school expenditures or in teacher quality or principal. ED should consider requiring lower-performing districts to monitor and address educator quality gaps across schools.

FIGURE 2

Changes in the principal quality gap over time, based on general and school-specific experience and the competitiveness of the principal's undergraduate institution



Note FRL stands for free/reduced price lunch; URM stands for underrepresented minority. Positive gaps imply FRL or URM students have less-qualified principals. The across district gap is portion of the total gap explained by principal sorting across districts, whereas the within-district gap is the portion explained by sorting within districts (the sum of across and within district gaps is the total gap).

Provide additional resources to districts to address educator quality gaps. One of the key takeaways from this study is that teacher and principal quality gaps do not result solely, or even primarily, from sorting of educator quality within school districts. Instead, historically underserved students are assigned to lower quality educators largely because of the district they attend (rather than the school they attend within their district). Thus, federal efforts to reduce educator quality gaps must consider districts' (not just schools') capacity to attract, develop, and retain high-quality educators. Title I funding could be altered to include additional funding for high-poverty districts to address across-district teacher quality gaps.

Expand the State Plans to Ensure Equitable Access to Excellent Educators to include principals. A federal program to reduce district-level teacher quality gaps requires state education agencies to measure teacher quality gaps and identify potential root causes (State Plans to Ensure Equitable Access to Excellent Educators). The policy focuses on teachers; however, as this study demonstrates, historically underserved students also have inequitable access to high-quality principals.

State Policy Recommendations

Increase state school finance equity. This study found that teacher quality gaps are caused by sorting of teachers across school districts within the same labor market. In other words, districts can attract more qualified and effective teachers from neighboring districts *within their own labor market*. Prior research shows that higher teacher salaries and superior working conditions are associated with a higher quality teacher applicant pools and

lower teacher attrition.ⁱⁱ However, the Texas school finance system allocates less funding to high-poverty, low-wealth districts.ⁱⁱⁱ A more equitable school finance system would allow high-poverty districts to offer more competitive salaries and working conditions, relative to neighboring districts.

Measure educator quality gaps both across and within school districts. The State Plans to Ensure Equitable Access to Excellent Educators policy requires states to monitor statewide teacher quality gaps, but few states assess whether these gaps are caused by within- or between-district sorting. Tennessee analyzed teacher quality gaps across and within *schools* and found that teacher quality gaps result primarily from across school gaps. However, state analysts did not consider the role of sorting of teacher quality across *districts*.

Consider mechanisms to desegregate school districts. State education agencies can reduce cross-district disparities in teacher and principal quality through regulations that reduce segregation. The National Coalition on School Diversity recommends that state education agencies include progress toward racial and socioeconomic integration as a factor in statewide accountability systems. The group also recommends that state education agencies allocate a portion of Title I funding toward programs that foster racial and socioeconomic integration.

Local Policy Recommendations

Consider the effect of classroom assignment on teacher quality gaps and equal educational opportunity.

Consistent with prior studies, this study found that on average, principals assigned historically underserved students to less qualified and less effective teachers. Although this form of teacher sorting is not the primary cause of teacher quality gaps, reducing the inequitable distribution of teacher quality within schools would reduce the overall teacher quality gap

Consider mechanisms to desegregate schools. District leaders can also take steps to reduce student segregation within school districts. Some districts have created elementary schools that serve a larger and more diverse geographic area, but fewer grade levels (e.g., reorganizing two K-5 elementary schools into one K-2 school and one grade 3-5 school). In other districts, school board members have re-drawn school boundaries to increase diversity across schools.

End Notes

ⁱ For evidence that policymakers refer to education as the key mechanism for reducing inequality, see Duncan, A. (2011). Remarks of U.S. Secretary of Education Arne Duncan at the Fayetteville State University Winter Commencement. Washington, D.C.: U.S. Department of Education. For scholarly work on this topic, see Carter, P. L. (2005). *Keepin' it real: School success beyond Black and White*. New York: Oxford University Press., 2005; and Reardon, S. F. (2011). The widening socioeconomic status achievement gap: New evidence and possible explanations. In R. J. Murnane & G. J. Duncan (Eds.), *Whither opportunity? Rising inequality and the uncertain life chances of low-income children*. New York: Russell Sage Foundation. Importantly, the United States has one of the only education systems among advanced nations that provides less funding for schools serving higher-need students. Among countries in the Organization for Economic Development and Cooperation (OECD), only the United States, Turkey, and Israel provide more teachers per student in schools serving more advantaged students (see OECD. (2016) *Education at a glance 2016: OECD indicators*. Paris, France: OECD Publishing. Retrieved from <http://dx.doi.org/10.1787/eag-2016-en>).

ⁱⁱ Knight, D. S. (2017). Are high-poverty school districts disproportionately impacted by state funding cuts? *School finance equity following the Great Recession*. *Journal of Education Finance*, 43(2), 169-194; Ushomirsky, N., & Williams, D. (2015). *Funding gaps 2015: Too many states still spend less on educating students who need the most*. Washington, D. C.: Education Trust.

ⁱⁱⁱ Bastian, K. C., Henry, G. T., & Thompson, C. L. (2013). Incorporating access to more effective teachers into assessments of educational resource equity. *Education Finance and Policy*, 8(4), 560-580; Clotfelter, C. T., Ladd, H. F., & Vigdor, J.L. (2005). Who teaches whom? Race and the distribution of novice teachers. *Economics of Education Review*, 24, 377–392; 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; 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.

^{iv} Two studies find that teacher quality gaps are generally small (Chetty, R., Friedman, J. N., & Rockoff, J. E. (2014). Measuring the impacts of teachers I: Evaluating bias in teacher value-added estimates. *American Economic Review*, 104(9), 2593-2632; and Mansfield, R. K. (2015). Teacher quality and student inequality. *Journal of Labor Economics*, 33(3), 751-788.

^v Isenberg, E., Max, J., Gleason, P., Potamites, L., Santillano, R., Hock, H., & Hansen, M. (2013). Access to effective teaching for disadvantaged students. Washington, DC: National Center for Education Evaluation and Regional Assistance, U.S. Department of Education. Retrieved from <https://ies.ed.gov/ncee/pubs/20144001/pdf/20144001.pdf>; Isenberg, E., Max, J., Gleason, P., Johnson, M., Deutsch, J., & Hansen, M. (2016). Do low-income students have equal access to effective teachers? Evidence from 26 districts. NCEE 2017-4008. Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from <https://ies.ed.gov/ncee/pubs/20174008/pdf/20174008.pdf>

^{vi} For example, prior research has highlighted the “comparability loophole” in which districts have equal staffing ratios across schools but allocate more teacher salary funding to non-Title I (low-poverty) schools because teachers in those schools have more experience and therefore earn higher salaries.

^{vii} See Knight, D. S. (2017). Are school districts allocating resources equitably? The Every Student Succeeds Act, teacher experience gaps, and equitable resource allocation. *Educational Policy*. DOI: 10.1177/0895904817719523.

^{viii} Figlio, D. N. (1997). Teacher salaries and teacher quality. *Journal of Economic Letters*, 55(1), 267-271.
Figlio, D. N. (2002). Can public schools buy better-qualified teachers? *Industrial and Labor Relations Review*, 55(4), 686-699.;
Imazeki, J. (2005). Teacher salaries and teacher attrition. *Economics of Education Review*, 24, 431-449; Loeb, S. & Page, M. E. (2000). Examining the link between teacher wages and student outcomes: The importance of alternative labor market opportunities and non-pecuniary variation. *The Review of Economics and Statistics*, 82(3), 393-408.

^{ix} Knight, D. S. (2017). Are high-poverty school districts disproportionately impacted by state funding cuts? School finance equity following the Great Recession. *Journal of Education Finance*, 43(2), 169-194.

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