

CHAPTER

Addressing Inequities in the US K-12 Education System

by Nora Gordon and Sarah Reber

DECEMBER 2021

Suggested Citation:

Gordon, Nora and Sarah Reber, "Addressing Inequities in the US K-12 Education System," in *Rebuilding the Post-Pandemic Economy*, ed. Melissa S. Kearney and Amy Ganz (Washington D.C.: Aspen Institute Press, 2021). Available at <https://www.economicstrategygroup.org/publication/gordon-reber/>

Addressing Inequities in the US K-12 Education System

AUTHORS

Nora Gordon* and Sarah Reber**

ABSTRACT

American public schools do not successfully prepare all students for careers or college. Significant disparities in educational outcomes by race, ethnicity, economic disadvantage, and disability are persistent. At the same time, outcomes for schools serving similar student populations vary considerably. Making equitable progress will require shoring up fundamentals throughout the K-12 system: how staff are trained, recruited and retained, and supported in their work; curriculum; safe and healthy school buildings; and how these components are organized and used in schools. This would mark a shift away from an emphasis on “silver bullet” interventions to improve schools. Some schools and districts will require additional resources and supports. These efforts are complicated due to the federalist landscape of elementary and secondary education, where states, local school districts, and the federal government all play important roles. Quick fixes are few and far between, but improvements to school infrastructure stand out as low-hanging fruit. We should learn from past efforts to improve the impact of educational policy and philanthropy going forward, with careful attention to strengthening the research base.

* McCourt School of Public Policy, Georgetown University and National Bureau of Economic Research.

Email: nora.gordon@georgetown.edu

** UCLA Luskin School of Public Affairs, National Bureau of Economic Research, and Brookings Institution.

Email: sreber@ucla.edu

Acknowledgements: We are grateful to Eric Brunner, Carrie Conaway, Thomas Dee, Amy Ganz, Dan Goldhaber, Douglas Harris, Melissa Kearney, and Susanna Loeb for helpful comments, and to Emily Pelles for excellent research assistance. Any errors are our own.

1. Introduction

Despite decades of efforts by federal and state policymakers and major philanthropic and research investments, America's schools have so far fallen short of meeting the ideal of preparing all students to succeed in college or in a career. Racial disparities in outcomes are large and persistent. The ongoing public discussion about how to address these gaps, and how to improve schools overall, can feel like a rotating mash-up of buzzwords. Many of the buzzwords stand in for good ideas, but they are too often presented in isolation as silver bullets. The 2021 list would include things like socio-emotional learning, science-based reading, high-dosage tutoring, restorative justice, formative assessment, quality curriculum, and universal pre-K. Yet time and again silver bullets *du jour* come up short, with proponents blaming "implementation problems" for the failure to deliver. There are no easy explanations for why this pattern persists. To be sure, there are many under-used policies and programs that we should work harder to implement well. But we will also need to acknowledge the limitations of one-off, top-down prescriptions. American public schools operate within complex systems, and we will not be able to "fix" schools without ensuring that the fundamentals are sound. Further, a well-functioning system will necessarily leave some discretion in the hands of district, school, and classroom leaders, highlighting the importance of staffing and leadership at every level.

In this chapter, we argue that to reduce inequities in American education, we must improve systems in ways that benefit all students and schools. While schools involve many moving parts that could each be improved, reforms to these individual parts are too often evaluated and advocated for in isolation despite functioning in inherently interdependent ways. At the same time, attending to the fundamentals is a necessary, but not sufficient, condition to improve schools for students who have been poorly served—or discriminated against—both in and out of school, including students of color, students living in poverty, and students with special instructional needs. With improved fundamentals, seemingly logical but poorly implemented silver bullets from the past could prove more effective. Limited resources and political capital pit program against program in federal, state, and local budget cycles. But because each individual program will work better in the context of stronger systems with high-quality staff, these choices should not be viewed as zero-sum trade-offs. Ideally, we could improve outcomes for all students and reduce disparities at the same time. At times, however, changes that will help disadvantaged and lower-achieving groups the most may help other groups even more, increasing gaps while maximizing the absolute level of improvements for disadvantaged students.

We provide an overview of research on the fundamental inputs to schooling—staff, peer groups, curriculum, and physical infrastructure—as well as how these inputs

are organized and combined in schools and classrooms. We also draw on research on attempts to “intervene” through add-on programs, which sometimes succeed according to rigorous evaluations but are less frequently successfully scaled, as well as “school turnaround” efforts targeting entire school buildings. Finally, we discuss reforms, such as test-based accountability, designed to improve student learning by changing governance and incentives at a higher level.

Even significantly improved schools will not, on their own, overcome the powerful influences of structural inequality and racism across American society, which contribute to persistent differences in educational outcomes across groups. A history of discrimination in housing, labor markets, policing, and other aspects of society means that low-income children and children of color often grow up in neighborhoods separate from their more-advantaged peers and are more likely to be exposed to a wide range of stressors that make succeeding in school difficult. Lead, air pollution, and other environmental hazards, violence in the community, police violence, economic despair and rising inequality, and adverse childhood events create obstacles to learning (Aizer et al. 2018; Currie and Schmieder 2008; Hardy, Logan, and Parman 2018; Nelson et al. 2020; Ang 2020; Kearney and Levine 2016; Sharkey et al. 2014). Policies that reduce child poverty and improve children’s out-of-school environments may in some cases do more to improve learning and reduce inequality than school-based policies. While schools alone cannot solve these problems, they are a key policy lever for promoting economic mobility, equality, and well-being.

We first document patterns and trends in educational achievement and attainment, overall and by race and ethnicity. We then present a short primer on American public schools, which operate in complex institutional systems that vary considerably from state to state. We then turn to the policy levers available for improving educational equity; we see improvements to fundamental aspects of schooling, such as staffing and curriculum, as key. We conclude with a discussion of important lessons from research and suggestions for where policymakers and advocates should focus attention going forward.

2. Patterns and trends in educational achievement and attainment

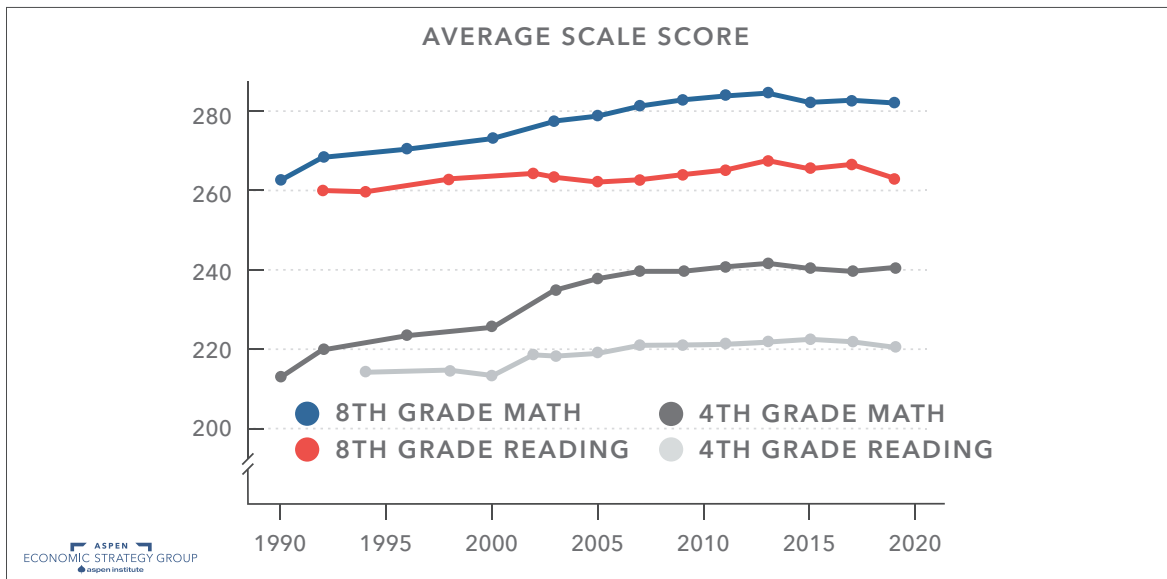
One thing is certain: America’s schools do not consistently prepare all students for college and for careers. We present data on key outputs of the education system—academic achievement, as measured by test scores, and educational attainment—which we discuss with important caveats in mind. First, schools do many things, and these are not the only outcomes that matter. Second, although we focus here on differences by race, understanding how schools are working—and how outcomes

vary—depending on other characteristics, such as English learner or disability status, is critically important. These categories are not consistently defined over time or across places, so data for these groups are often difficult to interpret or unavailable.

The No Child Left Behind Act required schools to report test scores by student “subgroups” including by race and ethnicity,¹ to shine a light on inequality and prevent systems from masking unacceptable outcomes for some groups behind school-level averages. It is in this spirit that we present data disaggregated by race and ethnicity in this section. We acknowledge that a focus on persistent disparities can foster a “deficit mentality,” undermining the view that all students can succeed (Bertrand and Marsh 2021). To be clear, these patterns should not let schools off the hook. Rather, they point to the need for both better schools and robust social policies to support historically marginalized families and those struggling economically.

Figure 1 shows trends in math and reading scores on the National Assessment of Educational Progress (NAEP), known as “America’s Report Card,” for 4th and 8th graders. Math scores improved substantially between 1990 and 2005 or so, especially for 4th graders. But progress has since stalled, and while 4th graders’ reading skills improved in the 2000s, scores have since plateaued, and 8th graders’ reading skills have barely improved since the mid-1990s.

Figure 1: Progress in math has stalled for a decade and reading achievement is flat

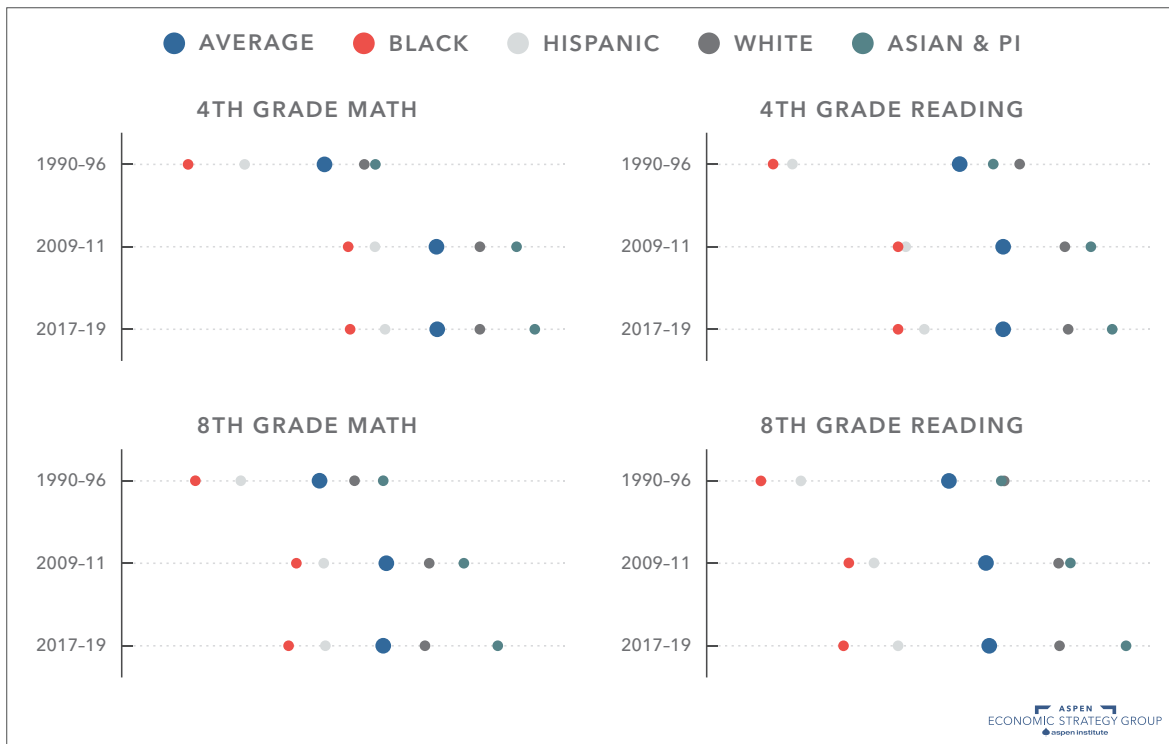


Source: National Assessment of Educational Progress (NAEP).

1 Office of Management and Budget (OMB) guidelines for classification of federal data by race and ethnicity specify that Hispanic or Latino origin (ethnicity) be collected in a separate question from race, and most of the data cited in this chapter follow that practice (Office of Management and Budget 1997). Unless otherwise noted, we categorize people of any race who identify as Hispanic or Latino as “Hispanic,” and the other racial groups exclude people who identify as Hispanic or Latino; we exclude the “non-Hispanic” modifier for ease of exposition.

Differences in outcomes across racial groups are persistent (Figure 2). Scores for all groups improved between the 1990s and early 2010s, and gaps narrowed.² Unfortunately, little has changed since then, and Black 8th graders have even lost some ground. The differences across groups are large—for example, the difference in the average score between the highest- and lowest-scoring groups is equivalent to about three grade levels. Of course, scores vary considerably across students, and there are low- and high-scoring students in all groups. Research also shows that students scoring toward the bottom of the distribution are falling further behind, suggesting a growing share of students are not learning basic skills.

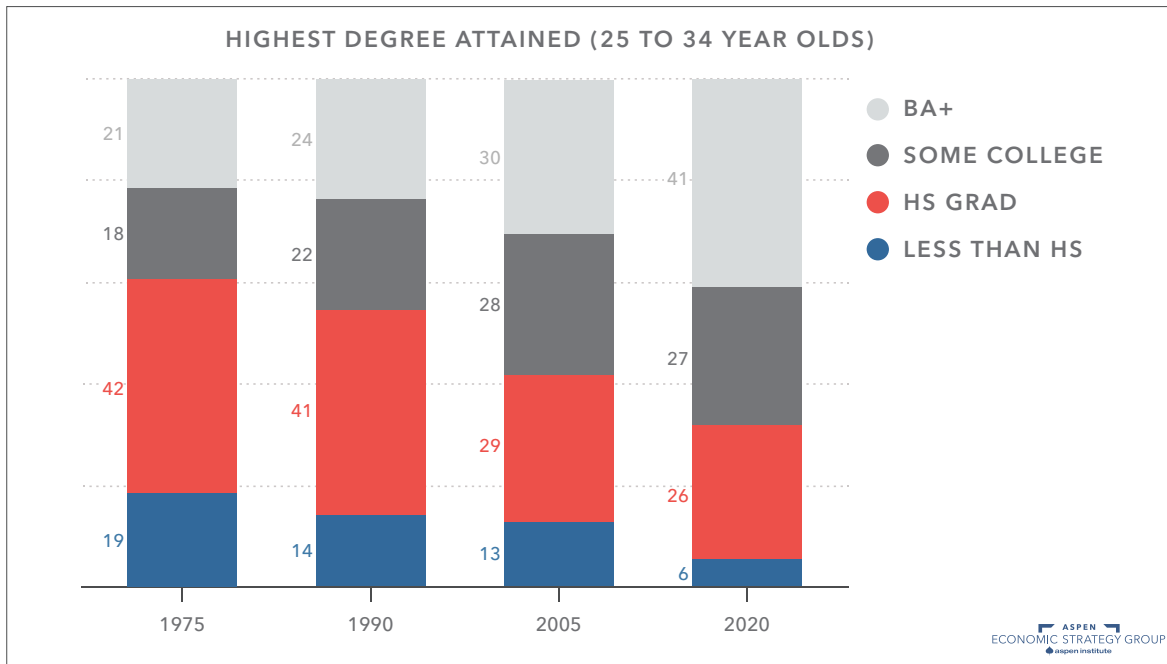
Figure 2: Test scores improved for all groups since the 1990s but progress has stalled and gaps are persistent



Source: NAEP.

Figure 3 shows trends in educational attainment of 25- to 34-year-olds, another important outcome of the education system. Since 1970, educational attainment has increased substantially: Today almost 40% of young people have a four-year college degree, and less than 10% are high school dropouts.

² Since 2003, the NAEP reading and math assessments were given to 4th and 8th graders consistently every other year, so the 2009-11 data point is the average of 2009 and 2011, and the 2017-19 data point is the average of 2017 and 2019. The years used for the 1990-96 average vary based on data availability: the math assessment was given in 1990, 1992, and 1996 for both grades; the reading assessment was given in 1992 and 1994 for 8th grade and 1994 for 4th grade.

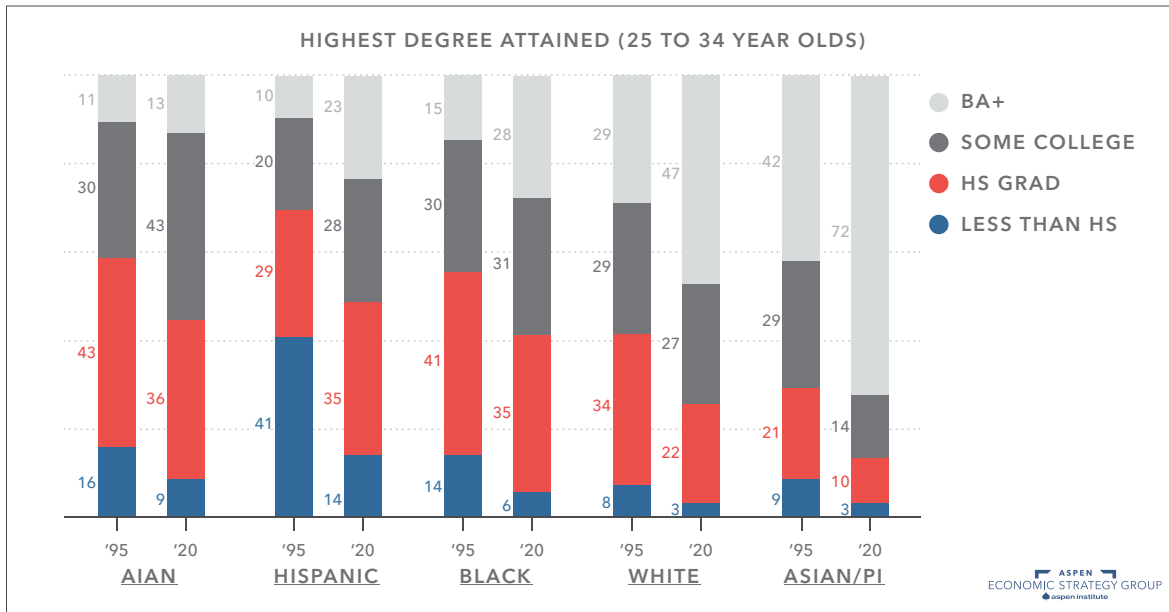
Figure 3: Educational attainment has increased over time

Source: Current Population Survey

While educational attainment has improved for all racial groups since 1995, there are substantial differences across groups (Figure 4). By most measures, educational attainment is lowest among American Indian/Alaska Native people, a group that has faced significant discrimination and neglect for centuries, though this group’s disadvantage is frequently overlooked, in part because data are scarce. The COVID-19 pandemic has shone a light on these disparities, and early research suggests it has likely widened them further (Parolin and Lee 2021; Bacher-Hicks, Goodman, and Mulhern 2020).

These documented gaps reflecting systematic inequalities are large, persistent, and deeply troubling. Less known is the substantial variance in school quality and outcomes even among schools serving students with similar backgrounds (Reardon 2019). That is, it is not just “troubled,” high-poverty schools, or urban schools, or schools that serve mostly students of color, that are falling short; *many* schools serving students across the socioeconomic spectrum are not living up to their potential. Underperforming schools may be one explanation for the large increase in the use of private supplemental tutoring: Kim, Goodman, and West (2021) document a rough tripling of this sector from 1997 to 2016. These centers are concentrated in areas with higher parental income and education. We are unlikely to achieve an equitable distribution of opportunity or a more productive workforce without improving the quality of schools across the board.

Figure 4: Educational attainment has increased for all groups but significant gaps persist



Source: Current Population Survey

3. A primer on elementary and secondary education in the United States

Here we review the basics of the American elementary and secondary education system: Who does what and how do we pay for it? The answers to both questions vary considerably across states.³

3.a. Who does what?

Schools are the institution most visibly and directly responsible for educating students. But many other actors and institutions affect what goes on in schools. Three separate levels of government—local school districts, state governments, and the federal government—are involved in the provision of public education. In addition, non-governmental actors, including teachers’ unions, parent groups, and philanthropists play important roles.

3.a.1. Schools

The vast majority of 5- to 17-year-old children attend public schools. (Expanding universal schooling to include up to two years of preschool is an active area of discussion which could have far-reaching implications, but we focus on grades

³ For state-specific information, consult state agency websites (e.g., Maryland State Department of Education) for more details. You can find data for all 50 states at the U.S. Department of Education’s National Center for Education Statistics <<http://nces.ed.gov>>, and information on state-specific policies at the Education Commission of the States <ecs.org>.

K-12 here.) About 10% attend private schools; about a quarter of private school students are in non-sectarian schools, and the remaining three-quarters are about evenly split between Catholic and other religious schools. About 3% of students are homeschooled. Magnet schools are operated by local school districts but enroll students from across the district; magnet schools often have special curricula—for example a focus on science or arts—and were sometimes designed specifically to encourage racial integration. Charter schools are publicly funded and operate subject to state regulations; private school regulations and homeschooling requirements are governed by state law and vary across states. Nationally, 6.5% of public school students are enrolled in charter schools; the remainder attend “traditional public schools,” where students are mostly assigned to schools based on their home address and the boundaries school districts draw. Washington, D.C. and Arizona have the highest rates of charter enrollment, with 45 and 18% of their public school students attending charter schools. Several states have little or no charter school enrollment. Prior to the COVID-19 pandemic, nearly all public schooling took place in person, with about 0.5% of students enrolled in virtual schools.

3.a.2. Local School Districts

Over 13,000 local education agencies (LEAs), also known as school districts, are responsible for running traditional public schools. The range of responses to the COVID-19 pandemic, with districts opting for fully in-person instruction, fully remote instruction, and everything in between, has highlighted the highly localized nature of school governance. The size and structure of local school districts, as well as the powers they have and how they operate, depend on the state. Some states have hundreds of districts, and others have dozens. District size is mostly historically determined rather than a reflection of current policy choices. But while districts can rarely “choose” to get smaller or larger, district size implicates important trade-offs (Andrews, Duncombe, and Yinger 2002; Gronberg et al. 2015). Having many school districts operating in a metropolitan area can enhance incentives for school and district administrators to run schools consistent with the preferences of residents, who can vote out leaders or vote with their feet by leaving the district. On the other hand, fragmentation can lead to more segregation by race and income and less equity in funding, though state laws governing how local districts raise revenue may address the funding issues. Larger districts can benefit from economies of scale as the fixed costs of operating a district are spread over more students and they are better able to operate special programs, but large districts can also be difficult to manage. And even though large districts have the potential to pool resources between more- and less-affluent areas, equity challenges persist as staffing patterns lead to different levels of spending at schools within the same district.

School boards can be elected or appointed, and they generally are responsible for hiring the chief school district administrator, the superintendent. In large districts, superintendent turnover is often cited as a barrier to sustained progress on long-term plans, though the causation may run in the other direction: Making progress is difficult, and frustration with reform efforts leads to frequent superintendent departures. School districts take in revenue from local, state, and federal sources, and allocate resources—primarily staff—to schools. The bureaucrats in district “central offices” oversee administrative functions including human resources, curriculum and instruction, and compliance with state and federal requirements. The extent to which districts devolve authority over instructional and organizational decisions to the school level varies both across and within states.

3.a.3. State Governments

The U.S. Constitution reserves power over education for the states. States have delegated authority to finance and run schools to local school districts but remain in charge when it comes to elementary and secondary education. State constitutions contain their own—again, varying—language about the right to education, which has given rise to litigation over the level and distribution of school funding in nearly all states over the past half century. States play a major role in school finance, both by sending aid to local school districts and by determining how local districts are allowed to tax and spend, as discussed further below.

State legislatures and state education agencies also influence education through mechanisms outside the school finance system. For example, states may set requirements for teacher certification and high school graduation, regulate or administer retirement systems, determine the ages of compulsory schooling, decide how charter schools will (or won’t) be established and regulated, set home-schooling requirements, establish curricular standards or approve specific instructional materials, choose standardized tests and proficiency standards, set systems for school accountability (subject to federal law), and create (or not) education tax credits or vouchers to direct public funds to private schools. Whether and how states approach these issues—and which functions they delegate to local school districts—varies considerably.

3.a.4. Federal Government

The authority of the federal government to direct schools to take specific actions is weak. Federal laws protect access to education for specific groups of students, including students with disabilities and English language learners. Title IX prohibits sex discrimination in education, and the Civil Rights Act prohibits discrimination

on the basis of race. The U.S. Department of Education issues regulations and guidance on K-12 laws and oversees grant distribution and compliance (Gordon and Pasachoff 2018). It also collects and shares data and funds research. The Bureau of Indian Education is housed in the Department of the Interior, not the Department of Education.

The federal government influences elementary and secondary education primarily by providing funding. Federal aid is typically allocated according to formulas targeting particular populations. The largest formula-aid federal programs are Title I of the Elementary and Secondary Education Act (ESEA), which provides districts funds to support educational opportunity, and the Individuals with Disabilities Education Act (IDEA), for special education. Both allocate funding in part based on child poverty rates. State and school district fiscal personnel ensure that districts comply with rules governing how federal funds can be spent and therefore have direct influence on school environments.

Since 1965, in addition to specifying how federal funds can be spent, Congress has required states and districts to adopt other policies as a condition of Title I receipt. The policies have changed over time, but most notably include requiring school districts to desegregate, requiring states to adopt test-based accountability systems, and requiring the use of “evidence-based” approaches. IDEA establishes protections for students with disabilities in addition to providing funding. The law guarantees their right to a free and appropriate public education in the least restrictive setting and sets out requirements for the use of Individualized Educational Programs. Because of these guarantees, IDEA allows students and families to pursue litigation.

Federal law prohibits conditioning funding on the use of any specific curriculum. The Obama Administration’s Race to the Top program was also designed to promote specific policy changes—many related to teacher policy—but through a competitive model under which only select states or districts “won” the funds. For the major formula funds, like Title I and IDEA, the assumption (nearly always true) is that states and districts will adopt the policies required to receive federal aid and all will receive funds; in some cases, those policy changes may have more impact than the money itself (Cascio and Reber 2013).

The federal government has also allocated significant funding to support schools during the Great Recession and during the COVID-19 pandemic through specially created fiscal stabilization or relief funds; federal funding for schools during the COVID crisis is significantly larger than during the Great Recession.

The federal tax code, while perhaps more visible in its influence on higher education, also serves as a K-12 policy lever. The controversial state and local tax (SALT)

deduction, now limited to \$10,000, reduces federal tax collections and subsidizes progressive taxation for state and local spending, including for education. As of 2018, 529 plans, which historically allowed tax-preferred savings only for higher education expenses, can also be used for private K-12 expenses.

3.a.5. Non-Governmental Actors

Notable non-governmental actors in elementary and secondary education include teachers' unions and schools of education, along with philanthropists, vendors, and other advocates. The nation's 3.5 million public school teachers are a powerful political force, affecting more than just teachers' compensation. This has been highly visible during the pandemic, as local unions influenced district-level reopening decisions and the National Education Association sent suggestions that made their way into CDC guidance (Zilbermintz 2021). Union strength varies considerably across U.S. states (Northern, Scull, and Shaw 2012).

Both states and institutions of higher education play important roles in determining who teaches and the preparation they receive. Policies related to teacher certification and preparation requirements, ranging from whether teachers are tested on academic content to which teachers are eligible to supervise student teachers, vary considerably across states.⁴ Meanwhile, reviews of teacher training programs reveal many programs do not do a good job incorporating consensus views of research-based best practices in key areas (Pomerance and Walsh 2020). To date, schools of education have not been the focus of much policy discussion, but they would be critical partners in any changes to how teachers are trained.

Philanthropy has an important influence on education policy, locally and nationally. Not only do funders support individual schools in traditional ways, they are increasingly active in influencing federal and state laws (Reckhow, Tompkins-Stange, and Galey-Horn 2021). Part of these philanthropic efforts happen through advocacy groups, including civil rights groups, religious groups, and the hard-to-define "education reform" movement. Finally, the many vendors of curriculum, assessment, and "ed-tech" products and services bring their own lobbying power (Burch 2009).

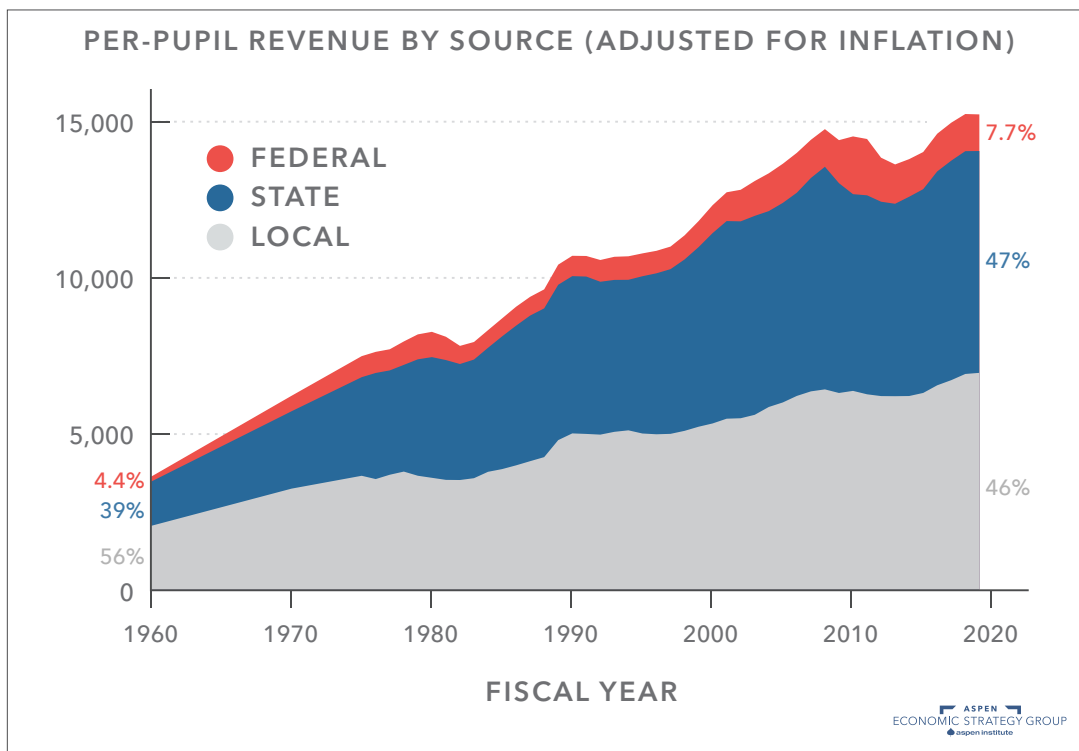
⁴ See the not-for-profit National Council on Teacher Quality <<https://www.nctq.org/>> for standards and reviews of teacher preparation programs, and descriptions of state teacher preparation policies.

3.b. Paying for school

Research on school finance might be better termed school district finance because districts are the jurisdictions generating and receiving revenue, and districts, not schools, are almost always responsible for spending decisions. School districts typically use staffing models to send resources to schools, specifying how many staff positions (full-time equivalents, or FTEs), rather than dollars, each school gets.

Inflation-adjusted, per-pupil revenue to school districts has increased steadily over time and averaged about \$15,500 in the most recent year recorded (total expenditure, which includes both ongoing and capital expenditure, is similar but we focus on revenue because we are interested in the sources of revenue). Per-pupil revenue growth tends to stall or reverse in recessions, and has only recently recovered to levels seen prior to the Great Recession (Figure 5). On average, school districts generated 46% of their revenue locally, with about 80% of that from property taxes; about 47% of revenue came from state governments and about 8% from the federal government. The share of revenue raised locally has declined from about 57% in the early 1960s to 46% today, while the state and federal shares have grown.

Figure 5: Revenue per pupil has increased over time but declined during the Great Recession



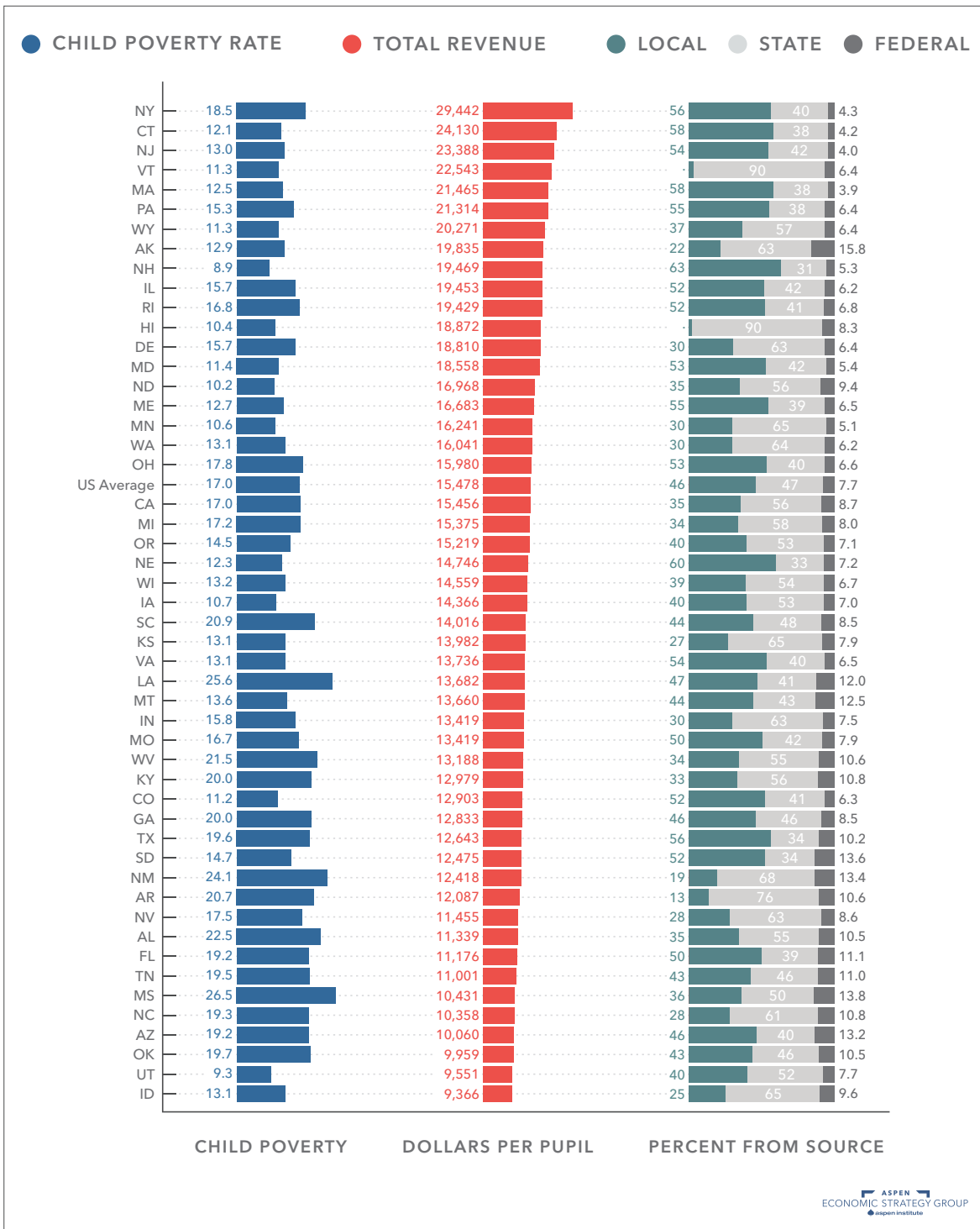
Source: Digest of Education Statistics

Notes: Per-pupil values have been adjusted to 2019 dollars using CPI-U.

Local revenue comes from taxes levied by local school districts, but local school districts often do not have complete control over the taxes they levy themselves, and they almost never determine exactly how much they spend because that depends on how much they receive in state and federal aid. State governments may require school districts to levy certain taxes, limit how much local districts are allowed to tax or spend, or they may implicitly or explicitly redistribute some portion of local tax revenue to other districts .

Both the level of spending and distribution of revenue by source vary substantially across states (Figure 6), with New York, the highest-spending state, spending almost \$30,000 per pupil, while Idaho, Utah, and Oklahoma each spent under \$10,000 per pupil. (Some, but far from all, of this difference is related to higher labor costs in New York.) Similarly, the local share of revenue varies from less than 5% in Hawaii and Vermont to about 60% in New Hampshire and Nebraska. On average, high-poverty states spend less, but there is also considerable variation in spending among states with similar child poverty rates.

Figure 6: Total revenue per pupil and revenue sources vary dramatically across states

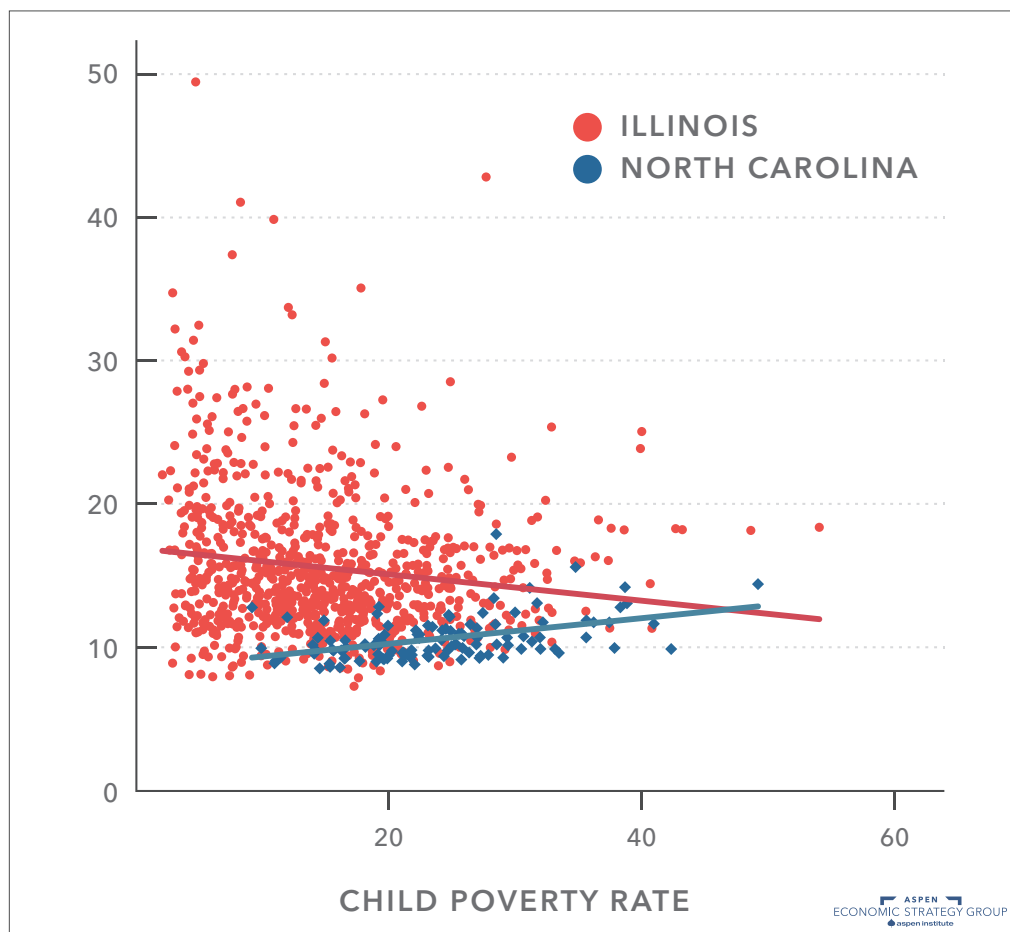


Source: Digest of Education Statistics

Notes: Per-pupil values are for the 2017-18 school year and have been adjusted to 2019 dollars using CPI-U.

Discussions of school funding equity—and considerable legal action—focus on inequality of funding across school districts *within the same state*. While people often assume districts serving disadvantaged students spend less per pupil than wealthier districts within a state, per-pupil spending and the child poverty rate are nearly always uncorrelated or *positively* correlated, with higher-poverty districts spending more on average. Typically, disadvantaged districts receive more state and federal funding, offsetting differences in funding from local sources. Meanwhile, considerable inequality exists between states, and poorer states spend less on average. Figure 7 illustrates this point, showing the relationship between district-level per-pupil spending and the child poverty rate in North Carolina (a relatively low-spending state with county- and city-based districts) and Illinois (a higher-spending state with many smaller districts). In North Carolina, higher poverty districts spend more on average; Illinois is one of only a few states in which this relationship is reversed. But this doesn't mean poor kids get fewer resources in Illinois than in North Carolina. Indeed, nearly *all* districts in Illinois spend more than most districts in North Carolina, regardless of poverty rate.

Figure 7: Per-pupil current expenditure in IL and NC

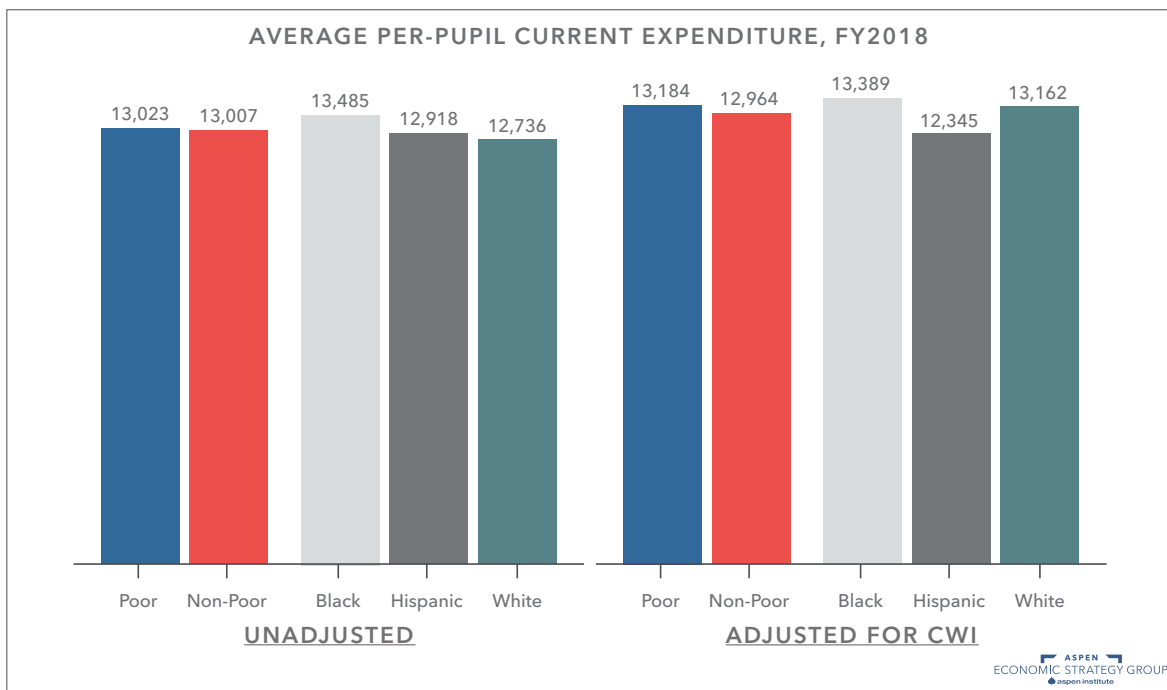


Source: Digest of Education Statistics

Notes: Per-pupil values are for the 2017-18 school year and have been adjusted to 2019 dollars using CPI-U.

Figure 7 gives a flavor of the wide variation in per-pupil school spending. Nationally, the district at the 10th percentile had per-pupil current expenditure of \$8,800, compared to \$18,600 at the 90th percentile (for these calculations we focus on current expenditure, which is less volatile year-to-year, rather than revenue). This variation is notably not systematically related to key demographics. For example, on average, poor students attend school in districts that spent \$13,023 compared to \$13,007 for non-poor students. The average Black student attends school in a district that spent \$13,485 per student, compared to \$12,918 for Hispanic students and \$12,736 for White students.⁵ School districts in high-wage areas need to spend more to hire the same staff, but adjusting spending to account for differences in prevailing wages of college graduates (the second set of bars) does not change the picture much.

Figure 8: On average, per-pupil current spending is similar across demographic groups



Source: Census of Governments/F-33, Common Core of Data, and Comparable Wage Index for Teachers.

Notes: Per-pupil values are for the 2017-18 school year and have been adjusted to 2019 dollars using CPI-U. Vermont is excluded due to data limitations.

5 These statistics may be particularly surprising to people given the widely publicized findings of the EdBuild organization that, “Nonwhite school districts get \$23 billion less than white school districts.” <<https://edbuild.org/content/category/problems>>. The EdBuild analysis estimates gaps between districts where at least 75% of students are non-White versus at least 75% of students are White. These two types of districts account for 53% of enrollment nationally. The \$23 billion refers to state and local revenue (excluding federal revenue), whereas we focus on current expenditure (though patterns for total expenditure or total revenue are similar).

Does this mean the allocation of spending is fair? Not really. First, to make progress reducing the disparities in outcomes discussed above, schools serving more disadvantaged students will need to spend *more* on average. Second, these data are measured at the *school district* level, lumping all schools together. This potentially masks inequality across schools in the same district. The federal government now requires states to report some spending at the school level; states have only recently released these data and they have yet to be systematically analyzed, but past research on selected districts suggests that within-district spending differences are systematically correlated with student characteristics. How does this happen, when property taxes and other revenues for the entire district feed into the central budget and are not allocated based on neighborhood characteristics? Most of what school districts buy is staff, and compensation is largely based on credentials and experience. So schools with less-experienced teachers spend less per pupil than those with more experienced ones, even if they have identical teacher-to-student ratios. Research suggests schools enrolling more economically disadvantaged students, or more students of color, on average have worse working conditions for teachers and experience more teacher turnover. Together, this means that school districts using the same staffing rules for each school—or even allocating more staff to schools serving more economically disadvantaged students—would have different patterns in spending per pupil than *staff* per pupil.

4. Policy levers for improving schools

To improve the quality of education American schools offer, something—realistically, many things—will have to change, but what? There is not, unfortunately, a proven and specific prescription for running schools well, nor is it likely that any one prescription is best across the wide range of local contexts in which American schools operate.

We begin this section with a discussion of key inputs: school staff, peers, curriculum and materials, and infrastructure, and the ways in which these inputs are combined in different arrangements through programming and scheduling. These inputs most directly influence instruction. They also cost money, so we next turn to how money matters, and how schools can get more of it. Finally, we turn to approaches that attempt to improve schools by changing incentives at a high level, including desegregation, school choice, standards and accountability, and the use of evidence in policy and practice.

Throughout, we emphasize what credible research shows and where research is inconclusive. Some educational approaches are more difficult than others to evaluate rigorously, so it is important to keep in mind that a lack of evidence does

not necessarily imply no impact. Much of the research in this area focuses on the average impact of these different approaches; some examine how different strategies affect different groups of students. Further, these strategies may have different effects (for some or all students) when implemented as part of more holistic efforts than in isolation, which is how they are typically evaluated.

4.a. Key inputs

4.a.1. School staff

Some of the most compelling findings in recent decades of education research show the importance of teachers and principals and how much effectiveness varies even in the same school district or school. A number of studies use “value-added” approaches to estimate teacher effectiveness, measuring how much each teacher’s students improve on tests, controlling for student characteristics including prior test scores. Researchers have raised a number of objections to this approach; for example, they argue that controls for student background may not be sufficient, in which case a teacher who is “ineffective” according to value-added measures may just be one who teaches students who face more barriers to learning. Others point out that good teaching is about more than raising test scores. Despite these concerns, the weight of the evidence suggests that these measures are meaningful, if imperfect, and that teacher effectiveness varies substantially across teachers (Chetty, Friedman, and Rockoff 2014).

Such research points to potentially large benefits of improving average teacher quality, either by changing how teachers are hired and who is retained or by helping existing teachers improve. Each of these approaches is challenging. Although recent research has identified some more effective approaches to screening teachers at the time of hire, standard hiring and compensation practices mostly reward degrees and certifications that do not consistently predict teacher effectiveness (Staiger and Rockoff 2010; Jacob et al. 2018; Goldhaber, Grout, and Huntington-Klein 2017). And better screening at the time of hire without also improving pre-service and in-service training or attracting more people to the teaching profession can only go so far, as teachers screened out by one school or district may simply be hired in another. Most in-service professional development programs for teachers are not effective, though some programs evaluated with randomized controlled trials have shown effects on teaching practice and student achievement (Institute et al., n.d.). And setting a higher bar for tenure (currently nearly all teachers receive tenure after completing the requisite number of years) faces major resistance from teachers’ unions. It would also mean more teachers would be inexperienced, and could influence entry into the profession.

Reducing barriers to entering the teaching profession is critical for several reasons. First, policies that would screen out more teachers at the time of hire or after a few years on the job would require a larger inflow to maintain staffing ratios. Further, would-be teachers cannot be expected to make major investments in certification if they face a significant chance of being asked to leave the profession after a few years. In addition, reducing barriers to entry could help improve diversity of the profession. While almost half of students are non-White, 80% of young teachers are White, and a growing body of research shows that students benefit from same-race teachers (Figlio 2017; Gershenson, Hansen, and Lindsay 2021). For example, one recent study showed that being assigned to at least one Black teacher in the early grades increased the likelihood that Black students graduate from high school by 9 percentage points (Gershenson et al. 2018). The under-representation of Black and Hispanic people among college graduates is a barrier to diversifying the teacher workforce, but there is scope to learn from states and school districts that have hired more diverse workforces and experiment with new approaches (Figlio 2017).

If teachers are so important, should we simply pay them more, or forgive teachers' student loans? Teacher pay has indeed been stagnant in recent years, though teachers have better-than-average benefits, the cost of which is increasing. Blanket loan forgiveness for teachers is not well-targeted for improving the recruitment and retention of highly effective teachers, though existing programs like the income-driven repayment and public service loan forgiveness programs need reform to make them more transparent and easier to use. Across-the-board pay increases are warranted in some places and could make teaching more attractive over time, but are unlikely to yield major improvements in student outcomes overall—and will do little to address disparities without other changes. Improving working conditions for teachers could also help; many of the “working conditions” teachers prefer—adequate planning time, appropriate training, reasonable student-teacher ratios, some autonomy—are key to effective instruction.

Although looming “teacher shortages” have been overstated, some types of teachers have been chronically under-supplied; for example, positions in math and science, special education, and teaching English learners are consistently difficult to staff (Dee and Goldhaber 2017). Higher salaries for these specialties are likely necessary to make sure those positions are consistently filled with effective teachers. Rural districts face additional staffing challenges and higher vacancy rates (Stoddard and Toma 2021).

More effective approaches would change the structure of teacher pay and create new career pathways for effective teachers. Most teacher salary schedules award higher salaries to teachers with degrees and certifications that are not consistently related to effectiveness, and more experienced teachers also earn higher salaries.

Together with the relatively generous pension benefits, this means that pay is back-loaded. Reforms that raise starting pay, put more emphasis on paying for credentials and training that are proven to improve teaching, or pay more for difficult-to-find expertise or to work in hard-to-staff schools are more promising.

A number of states and school districts implemented teacher evaluation reforms in the 2010s, sometimes paired with more fundamental changes to the structure of pay and dismissal practices. The approaches varied, but common components included new methods for evaluating teachers (usually based on student test scores or observations), one-time bonuses or permanent pay increases based on those evaluations, bonuses for teaching in particular schools, and new career pathways where teachers serve as mentor teachers or observe and evaluate other teachers. A common goal of this type of reform was to end the common practice of *pro forma* teacher evaluation, where vanishingly few teachers receive unsatisfactory ratings. By and large, these reforms were not well-implemented and did not lead to more differentiation in teachers' performance ratings, though in some cases they brought renewed attention to instructional quality (Kraft and Gilmour 2017). Even if few teachers are dismissed, more extensive (or different) teacher evaluations can prompt teachers to pay more attention to their practice, and some systems involved explicit feedback from a mentor teacher. One study found that teachers who participated in a more intensive evaluation program—where they were observed and rated several times during the year—were better teachers for several years following the evaluation (Taylor and Tyler 2012).

The District of Columbia school system implemented one of the more comprehensive reforms, IMPACT. The program was controversial and underwent two major revisions, landing on a system that gave strong incentives for low-performing teachers to improve or be dismissed and for highly effective teachers to work in the most disadvantaged schools (among other provisions), but did not rely too heavily on value-added measures of teacher performance or school-wide rewards. An evaluation of the IMPACT program showed it produced a broad and sustained improvement in teacher effectiveness (Dee, James, and Wyckoff 2021).

Aside from increasing pay or improving working conditions to attract and retain better teachers or formal training, other factors can influence teacher effectiveness. For example, pairing student teachers with more instructionally effective cooperating teachers—rather than just more experienced ones—improves their subsequent performance as new teachers (Ronfeldt, Brockman, and Campbell 2018). Allowing teachers who have been certified in one state to more easily teach in another state could alleviate shortages in some cases (Goldhaber, Grout, and Holden 2017).

Principals and school counselors have also been shown to influence student outcomes. Though individual counselors matter (Mulhern 2020), there is little research on improving counselor quality, but the Wallace Foundation has developed a promising approach to developing “principal pipelines” to identify aspiring principals from existing staff and prepare and support them as new principals. This relatively inexpensive program had positive impacts on student achievement and principal retention (Gates et al. 2019).

4.a.2. Peers

Students in a school influence each other through a number of channels. They may learn from each other, influence what type of curriculum is offered, influence the culture of the school, and use more or less of the teacher’s time. A disruptive student can reduce the time students are actively learning. Parents care a lot about who their children will attend school with, in part for nonacademic reasons. Studying peer effects is difficult because students with similar characteristics tend to enroll in the same schools—“birds of a feather flock together”—so it is not surprising to find that, for example, students with high-scoring peers themselves have high test scores. And how peers affect each other can be complex and context-dependent. Estimates of peer effects cover a wide range, and some methodological questions remain. Several studies find that students benefit from having more girls and more high achieving peers, and that high achieving students benefit most from other high achieving peers (Sacerdote 2011). A recent study finds that U.S.-born students benefit from having more immigrants in their schools, and this effect is concentrated among lower-achieving students (Figlio et al. 2021). Some (but not all) studies suggest that students do better when variation in achievement is lower (Sacerdote 2011), possibly because it is easier to target instruction when students are working at similar levels (Duflo, Dupas, and Kremer 2011).

Students with behavioral problems appear to negatively impact their peers’ learning, and this is a possible reason that having more girls in a class is beneficial (Pope and Zuo 2020; Carrell and Hoekstra 2010). One recent study finds that sharing a classroom with a student who is exposed to domestic violence affects educational outcomes years in the future and even reduces wages (Carrell, Hoekstra, and Kuka 2018). This points to the potentially enormous benefit of addressing the underlying problems of students who disrupt classrooms.

4.a.3. Curriculum and educational products

While curriculum is often operationalized in part by instructional materials, such as textbooks or software, educators conceptualize it more broadly. Grover “Russ”

Whitehurst, the founding director of the Institute of Education Sciences, defines curriculum as “the content and sequence of the experiences that are intended to be delivered to students in formal coursework.” (Whitehurst 2009) This definition encompasses much of the work of schools, so it’s hard to imagine efforts to improve schools that do not address curriculum. However, it is far from straightforward to improve schools by changing curriculum or instructional materials.

Not only must leaders choose the right curriculum for their contexts, they must ensure it is implemented well (Polikoff, Wang, and Kaufman 2021). These two issues are closely linked: A curriculum that improves student outcomes in one place will not work in another context if staff lack the resources or will to implement it well. Educators also regularly choose their own supplementary materials. For example, over half of teachers surveyed in the 2017 American Teacher Panel reported using the website TeachersPayTeachers.com at least once a week to obtain supplementary materials (Kaufman et al. 2017). Educators report wanting more information to help them choose materials that are cost effective and aligned with curricular standards (Polikoff and Campbell 2018). In practice, resources exist to help identify “evidence-based” materials (*e.g.*, the What Works Clearinghouse), or to identify materials that are aligned with standards (*e.g.*, EdReports), but not both in a one-stop shop. Further, information on the full set of costs associated with implementation is hard to come by.

Proponents of “culturally relevant pedagogy”—which can include a range of practices designed to nurture students’ ethnic and social identities, appreciating their own culture while developing fluency in at least one other culture—argue it can improve student learning, in part by strengthening the student-teacher relationship. These approaches have strong theoretical underpinnings but have rarely been evaluated systematically. Some programs supported by the Obama Foundation’s My Brother’s Keeper initiative promote culturally relevant pedagogy. And California has developed model ethnic studies courses for use in its schools. An evaluation of Oakland’s My Brother’s Keeper program, a high-school level course staffed by Black men, found it reduced dropout rates (Dee and Penner 2019); an ethnic studies program in San Francisco improved attendance, GPA, and credits earned substantially (Dee and Penner 2017). Further research should assess whether these promising programs are effective when adopted at scale.

In most cases, “evidence-based” educational materials are stand-alone curricular components, not a full curriculum.⁶ The success of one component often depends on what else is happening in the school; for example, a social studies program centered around primary source materials may work well only if students have had reading

6 See, for example, the What Works Clearinghouse <<https://ies.ed.gov/ncee/wwc/>>.

instruction sufficient to understand the primary sources. This makes evaluations of such individual components hard to interpret. Another challenge comes from the nature of evaluation itself: Programs subject to evaluation must be defined clearly—and in some cases rigidly—if the results of the evaluation are to generalize to other settings. In other words, the programs must be designed to minimize educator discretion, which rules out many less rigid approaches from being evaluated in ways that would deem them evidence-based (Gordon 2018). These evaluation challenges are greater still when it comes to special education, which centers around providing and delivering an Individualized Education Program to each student.

The marketplace for educational products, such as textbooks and software, is segmented into “core” and “supplemental” products. The core corresponds to what you may think of as standard school: the instruction that goes on in general (not special) education classrooms. Supplemental products are designed for when students do not achieve proficiency, as determined by grade-level benchmarks. Supplemental products are widely used in part because the structure of state and federal funding mean that districts may find it easier to spend on supplemental services than on shoring up the core. School districts feel pressure to show that categorical funding streams, like Title I federal funds, state funds for English learners, or special education dollars, are cleanly allocated to expenditures benefiting *only* those students—even if spending on the core, which would benefit all students, might help the target population more than add-on interventions (Gordon and Reber 2015; Setren forthcoming).

4.a.4. School infrastructure

Research shows that spending on capital improvements or to build new schools improves test scores and other outcomes (Jackson and Mackevicius 2021). Though the CDC notes there is no safe level of lead exposure for children, 37% of schools that test for lead reported elevated lead levels; fewer than half of districts even tested (GAO 2018b). Evidence that poor indoor air quality and exposure to lead and other toxins impedes learning and can have long-term effects is now conclusive (Aizer et al. 2018; Stafford 2015). Approximately one-third of schools require HVAC updates (GAO 2020). Studies also show that heat impacts learning adversely, especially when schools do not have air-conditioning (Park et al. 2020; Park, Behrer, and Goodman 2021). Schools serving low-income students and students of color are more likely to lack air conditioning conditional on other factors, and Park et al. (2020) estimate that heat accounts for 1 to 13% of U.S. racial achievement gaps. Installing air conditioning could plausibly help shrink achievement gaps.

4.a.5. Organizing these inputs

The effectiveness of the individual inputs we have described above depends on how the inputs are combined and used in schools. Districts and schools have considerable discretion over scheduling, and over how they group students, teachers, and other staff in schools and classrooms. These organizational choices include determining school and class size, how students and teachers are assigned to each room, how students are grouped inside classes or “pulled out” to work with a paraprofessional or specialist, and how to handle student behavioral problems.

Class size is a key concern for many teachers and parents. After declining steadily for decades, student-teacher ratios⁷ increased during the Great Recession and have remained somewhat elevated since, and are about average in the OECD. Student-teacher ratios vary substantially across states, ranging from about 23 in Arizona, California, and Utah, to about 12 in several states. Studying the effects of class size is difficult because a number of factors can influence which students and teachers are in smaller classes. In the 1980s, the state of Tennessee conducted a randomized experiment—Project STAR—to test the effects of small classes. Research on Project STAR found substantial benefits of smaller classes (Krueger 1999) and has contributed to a widespread view that class size reduction “works,” though class size reduction is expensive, and Chingos (2013) concludes the STAR intervention was not cost-effective.

Large-scale class-size reductions are often not able to replicate the idealized conditions of the STAR experiment. For example, California’s class-size reduction program, which focused on the same grades as STAR, produced a reshuffling of staff that worsened teacher experience inequities across schools (Schrag 2006). Compelling (but nonexperimental) work has failed to identify similarly large effects of class-size reduction in more recent data (Schwartz, Zabel, and Leardo 2017). Still, class size—or staff-to-student ratios more generally—may matter in ways that are not easily captured in this research. For example, class size is an important working condition and may affect which teachers can be attracted and retained, and some instructional approaches may only work in smaller classes.

Experimental assignment to small or large schools poses an even greater challenge, and the research base on this question is small. Most compelling studies suggest small schools have modest benefits (Gershenson and Langbein 2015; Barrow,

⁷ This is not quite the same as “class size” because it includes special education and other teachers who may not be “regular classroom teachers.”

Schanzenbach, and Claessens 2015). Meanwhile, schools could reap large benefits—at little cost—by starting the school day later for middle and high schools (allowing adolescents to get enough sleep) and creating K-8 schools to avoid transitioning adolescents to new schools at the developmentally challenging time of 6th or 7th grade (Jacob and Rockoff 2011).

School leaders make many decisions about how students are grouped within buildings and rooms. For example, how many different “levels” of algebra II are offered in a high school? Are gifted and talented students pulled out of their regular classrooms one period per week for supplemental instruction, do they attend different schools, or are they granted access to additional materials while remaining in their regular classroom settings? Such choices could have important implications for student achievement and equity. Unfortunately, documenting the causal impacts of these grouping choices is challenging. Not only are data sparse, but local needs and capacity drive choices to use these practices and, independently, student outcomes (Nomi 2009). Further, the effectiveness of different grouping strategies is surely linked to the curriculum and pedagogical practices they are used alongside.

Despite the importance of and considerable variation in teacher effectiveness, the allocation of teachers to schools is generally not made purposefully. In most districts, new teaching vacancies are first offered to teachers within the district, and more experienced teachers tend to move to placements in more advantaged schools over their careers. This means that inexperienced teachers are disproportionately hired in schools serving low-income students and students of color. This turnover harms student achievement (Ronfeldt, Loeb, and Wyckoff 2013; Carver-Thomas and Darling-Hammond 2017). Lower-achieving students and Black students appear to be more affected by teacher quality, so improving the level and distribution of quality teachers could reduce disparities (Aaronson, Barrow, and Sander 2007). Collective bargaining agreements typically prohibit “forced placements” of teachers into specific schools; even without such agreements, teachers might leave a district rather than take an assignment they find undesirable. Research suggests it is far costlier to use financial incentives to induce teachers to switch schools than to retain them in schools where they already teach (Dee and Goldhaber 2017).

Schools must decide not only how to group students for instruction relating to the core curriculum, mapping to grade-level standards, but also for additional supports. “High-dosage” tutoring, in which a trained tutor works with no more than a few students at a time, either at least three times a week or in intensive, week-long programs (Robinson et al. 2021), is a promising approach for students performing below grade level; both the grouping of students and staff and what happens during the sessions are important for a successful program.

For some students, specialized instruction or services are required by law (*e.g.*, students with disabilities, special education, English learners, gifted and talented). Even for these students, schools have some discretion in how they group them; for example, students can be “pulled out” of general education classrooms for additional services or have additional resources “pushed in” to that classroom, or they can use separate classrooms or schools for some students. Teachers need more preparation to serve English learners and students with disabilities more effectively, and more research on how to improve outcomes for these students more broadly is sorely needed (Mavrogordato et al. 2021).

There is, however, a strong research consensus that the processes *identifying* students eligible for a range of specialized services are not equitable. Grissom and Redding (2016) find that Black students are half as likely to be referred for gifted programs compared with White peers, even after controlling for test scores, with a notable exception: when Black students have a Black teacher. Universal screening processes that test all students for gifted eligibility rather than those whose parents opt in are one strategy to support more inclusive identification; another is to rely on a range of assessments rather than just one. Some large districts are just beginning to eliminate the use of standardized tests for admission to competitive magnet schools.

Racial disparities in special education are known as “disproportionality” and related discussions often focus on over-identification—students being incorrectly classified as having a disability—perhaps due to concerns that the classification serves to remove students from general education classrooms rather than to provide useful services (Gordon 2018). However, under-identification—students who do have disabilities not receiving what would be an accurate classification—is also a serious problem, as it may prevent students from receiving important services to which they are entitled. Some states are turning to universal screening as a tool for more accurate identification of some high-incidence learning disabilities such as dyslexia. For those policies to be effective, positive screens need to result in timely full evaluations, and, perhaps most challenging, schools must be equipped to serve students identified with disabilities.

Students are sometimes removed from the general education setting for noninstructional reasons as well. The use of exclusionary discipline, including suspension and expulsion, disproportionately affects students of color, even controlling for the incident leading to disciplinary action (Barrett et al. 2019). Black boys have the highest rates of out-of-school suspension of any group, with 18% suspended at least once in a given school year, over three times the rate for White boys (GAO 2018a). Principals play a significant role in the prevalence of suspension use; for example, Bacher-Hicks et al. (2019) find that attending schools

run by principals who encourage suspension increases the likelihood that students, especially males and students of color, are arrested and incarcerated later in life. Lindsay and Hart (2017) find that Black students are less likely to be suspended when their teacher is also Black.

Two popular alternatives (or supplements) to exclusionary discipline are restorative justice and positive behavioral interventions and supports. Both methods require staff time and investment in training (Gray et al. 2017). A random assignment evaluation found that restorative justice practices implemented in Pittsburgh public schools reduced suspensions but negatively impacted math scores for Black students in elementary and middle school (Augustine et al. 2018).

4.b. Budget

To what extent do better schools simply spend more? The idea that increasing funding would improve schools is intuitive, yet many early studies found a weak, or even negative, relationship between school spending and outcomes, leading some to shift focus away from how much schools spend toward how they spend it (Hanushek 1997). These older studies suffered from some methodological limitations, and a meta-analysis of more recent studies shows that additional funding does typically improve test scores and educational attainment (Jackson and Mackevicius 2021). The size of the effect varies considerably across studies, suggesting again that context matters. The analysis points to larger benefits of additional spending in schools that serve low-income students and finds little evidence of diminishing returns to additional spending so far. Effects of spending on educational attainment are typically larger than effects on test scores, suggesting that not all improvements in school quality are captured by test scores.

Unfortunately, data limitations mean most studies on spending do not provide much insight into how money is spent, although they do sometimes distinguish capital expenditures from ongoing spending and find that both types of spending benefit students. Meanwhile, research on how specific initiatives affect student outcomes historically has not reported costs, though this appears to be changing. In 2020, the Institute of Education Sciences began to require cost analysis in funded research projects.

Increasing school spending—and targeting aid to where it is needed most—is more difficult than it seems because lower levels of government can adjust their spending in response to aid from higher levels of government. For example, a school district that receives more funding from its state might cut taxes instead of increasing spending.

In the last half century, states have frequently changed the amount and method of distributing aid to local districts, often in response to litigation related to education provisions in state constitutions. Usually, the goal of these changes is to reduce inequality in spending across districts or increase spending in particular types of districts (defined by low spending, low income, or low tax bases, depending on the context). These reforms have reduced, but far from eliminated, spending disparities across districts within states and reduced inequality in outcomes (Card and Payne 2002; Lafortune, Rothstein, and Schanzenbach 2018). The average effects of school finance reforms on spending mask considerable heterogeneity across states; in some states, they have little impact on spending (Shores, Candelaria, and Kabourek 2020).

Unfortunately, key questions about state school finance programs remain unanswered. Successful legal challenges to state systems prompt judicial mandates that typically tell the state what distribution of spending is acceptable, but not how to achieve it. This may well be because there is not a consensus among researchers or advocates on the best way to achieve more equal or equitable funding. Recent research provides suggestive evidence that equalization plans and categorical aid correlate with more progressive post-reform outcomes (Shores, Candelaria, and Kabourek 2020). Court orders prescribing more and more equitable funding appear to be more likely to translate to action where unions are strong; in states with weaker unions, increased state aid more often leads to local property tax reductions instead of spending increases (Brunner, Hyman, and Ju 2020). In many states, litigation has not had its intended effects, while a number of states without court orders have increased the level of spending and adopted similar formulas as those with court orders.

Local school districts and state governments might respond in ways that “undo” federal aid, especially since federal funding is a small share of the total. Local school districts could reduce their own taxes (or fail to raise them as much as they would have) when they receive more federal funding, depending on state rules governing local taxation; evidence on this question is mixed (Gordon 2004; Cascio, Gordon, and Reber 2013). State governments could offset federal aid by reducing their own effort or giving less state aid to districts that receive more federal aid. This question is important but difficult to study because responses might play out over time and we don’t know what states would have done in the absence of aid. This is also why attempts to prevent this type of offsetting behavior, such as maintenance of effort requirements, are not effective.

The discussion above speaks to challenges in increasing budgets at the school district level, but resource differences across schools within districts are also important. Policymakers and advocates have only recently focused on this issue. One approach aiming to address these gaps is weighted student funding (WSF). In theory, WSF

directs dollars rather than positions to schools, and advocates typically propose this in conjunction with devolving more decision-making to the school level. In practice, this model is challenging to implement and sustain. A recent review of formulas used in WSF districts found that on average, districts ran less than half of funds through these formulas (Roza, Hagan, and Anderson 2021). Moving from a system where districts fund actual salaries of the staff employed in a school to providing schools a pot of funds that depend on student characteristics would leave schools with more experienced teachers unable to maintain their current workforce, redirecting those funds to schools with less experienced teachers. Most districts have labor agreements that prohibit forced transfers of teachers from one school to another, and federal policymakers have maintained support for “no forced transfers” in negotiations over how federal funds are used to influence the allocation of resources across schools.

4.c. Changing systems: governance and incentives

So far we have discussed changing budgets and a range of specific educational inputs. Other approaches attempt to change systems in ways that advocates hope will improve incentives, governance, or accountability and encourage better outcomes.

4.c.1. School desegregation

The 1954 Supreme Court ruling in *Brown v. Board of Education* did not immediately dismantle segregation, but between 1965 and 1970, most Southern school districts did desegregate, sometimes, though not always, under the supervision of a federal court (Cascio et al. 2008). Larger city districts and non-Southern districts continued to desegregate through the 1970s (Reber 2005). Desegregation directly changes students’ peers, but that is not the only or even the most important effect of these programs. Advocates hoped that the quality of schools attended by Black students would improve if White students attended those same schools, presumably due to some change in the political economy governing the allocation of resources. Research on desegregation in the 1960s and 1970s largely supports that notion: segregation declined, despite some White flight (Reber 2005), and Black students benefited from attending desegregated schools (Reber 2010; Johnson and Nazaryan 2019). This appears to be mostly because desegregation improved the quality of schools Black students attended, by giving them access to better-resourced, formerly White schools and increasing spending (Reber 2011; Tuttle 2019). School desegregation significantly reduced the number of Black teachers, which likely reduced the benefit to Black students overall (Thompson 2020). Fewer studies are able to examine the effects of desegregation on educational outcomes for White students, but those that do find little effect (Tuttle 2019).

In the 1970s, school districts were often required by a court to make race-conscious school assignments to counteract residential segregation, but the current legal environment limits districts' ability to use race-conscious school assignment policies (including some that were originally ordered by a court). Still, how district boundaries and school attendance zones are drawn influences segregation. Historically, schools were more segregated than neighborhoods; Linda Brown did not want to go to a *White* school, she simply didn't want to travel to the Black school. In most school districts today, schools are about as segregated as expected based on residential patterns, and a small number of districts have attendance zones that are less segregated than neighborhoods (Monarrez 2021). Districts could take some actions to promote more integrated schools, but addressing residential segregation is critical to making real progress on school segregation: Parents prefer their children attend school close to home (Phi Delta Kappan 2017), and the current legal environment is unfriendly to ambitious desegregation approaches.

4.c.2. *Choice programs*

A number of approaches to reform that have been proposed or tried involve introducing additional schooling options that break the link between where a student lives and the school they attend: vouchers, charters, open enrollment, magnet schools, education tax credits, virtual academies, and homeschooling options. School choice programs could improve schools through several channels. First, they create options that may be better than the alternative for the particular students who choose to attend. By definition, parents who take advantage of these programs prefer the “choice” school to their next best alternative. However, this may simply reflect the low quality of the available traditional public schools, and sometimes choice schools produce measurably worse outcomes. Second, choice schools can serve a research and development purpose, acting as laboratories to try out new educational approaches. This was initially a key argument for charter schools, but while research on charter schools has identified some promising practices, efforts to bring those practices to traditional public schools have been limited, and the “laboratory” role of charters has been deemphasized over time.

Finally, choice programs could have a broader impact by creating competitive pressure on all schools, including traditional public schools, to improve. Even in the traditional system, where students are assigned to schools based on where they live, parents have choice and schools face competitive pressure since families can choose where to live or can send their children to private schools, subject to their ability to pay. While choice—among traditional school districts or through open enrollment, charters, or other mechanisms—can provide incentives for quality, it

can also increase sorting of students by family income or other characteristics or make it difficult to redistribute resources. Choice programs may encourage schools to compete by enrolling students who enter with higher achievement levels and require fewer supports—“cream skimming”—rather than by improving value-added. The details of how choice programs are designed and financed matter critically for how much students who enroll in them benefit and whether they have positive or negative spillovers to the rest of the system.

Among choice programs in the United States, charter schools have the largest reach and are the most researched. The charter authorization process and funding approaches vary considerably across states, and individual charter schools vary in their instructional approaches, so generalizing about charter schools is difficult. Large statewide or national studies of charter school effectiveness typically find that charter schools have a small positive or no effect on student achievement on average. A number of studies estimate the effectiveness of oversubscribed charter schools by comparing students who gained admission through a lottery to those who applied for the lottery but did not gain admission and tend to find larger benefits of attending a charter school, compared to the broader studies of all charters (Cohodes and Parham 2021). This makes sense because the schools that have lotteries are by definition oversubscribed so more likely to be better than the available alternatives, which are often low-performing, urban schools. Virtual charter schools are harder to study because students often choose them because they are already struggling, but research suggests they produce worse academic outcomes than in-person schools (Fitzpatrick et al. 2020; Ahn and McEachin 2017).

With respect to cream skimming and student sorting, the story is mixed. Overall, the presence of charter schools appears to increase racial segregation modestly, though this varies considerably across states (Monarrez 2019). Charter schools are not allowed to have selective admissions, but they could influence who enrolls with policies such as onerous enrollment procedures and parental involvement requirements, discriminatory recruitment strategies, or with discipline policies that formally or informally push some students out. On the whole, there is little evidence that charters cream skim high-achieving students or push out low-achieving students; in fact, they often target disadvantaged, low-achieving students (Kho 2021). However, evidence suggests that some charters try to avoid enrolling students with disabilities (Bergman and McFarlin 2020) or to push out students with behavioral problems (Kho 2021). Setren (forthcoming) found that students with disabilities in Boston Public Schools were more likely to lose their classification if they won a charter lottery than if they lost; their achievement also improved.

Whether competition from school choice improves traditional schools is the big question. The evidence on charter schools is mixed but on balance suggests moderate improvements in nearby schools due to charter competition (Cohodes and Parham 2021).

Evidence on other choice programs is more limited, in part because experience with those programs in the United States is limited. Traditional voucher programs give families money that can be used to attend private school, with some restrictions. More recently, some states have tax credit scholarship programs, which allow corporations and other taxpayers to subtract the value of contributions made to qualifying non-profit scholarship programs from their taxes, effectively making the donations (including to religious schools) free to the taxpayer. Because charter schools are public, they are subject to state testing requirements that do not always apply to voucher or tax credit programs, making those programs difficult to evaluate. In Florida, which operates the largest such program, participating in the program was found to increase both enrollment and graduation from college (Chingos, Monarrez, and Kuehn 2019).

Research on small voucher programs implemented in the 1990s and 2000s showed small to substantial benefits for participating students, depending on the study; they often estimate larger benefits for Black students (Epple, Romano, and Urquiola 2017). More recent voucher programs showed smaller benefits, and one study found substantial negative effects of a private school voucher program in Louisiana (Abdulkadiroğlu, Pathak, and Walters 2018).

Open enrollment programs—where students can enroll in schools other than the neighborhood school to which they are assigned—or ranked choice programs—where families list their school choices and are assigned a school based on their lottery number combined with an assignment algorithm—have grown in popularity, especially in large urban districts. Research on these programs mostly focuses on how families choose and what those choices imply about what they value in schools and less about the effects of choice on student outcomes.

Overall, choice programs can provide families schooling options they prefer to the traditional public school to which they are assigned. Rigorous evaluations of such programs tend to find participating students benefit, though the magnitude of these effects varies considerably and is often small and sometimes negative (Epple, Romano, and Urquiola 2017). Competition from schools of choice has so far not been a game-changer, and the benefits of choice programs are ultimately limited by the availability of high-quality schools near where disadvantaged students live.

4.c.3. *Standards and accountability*

Rather than dictating how local districts should operate their schools, the idea behind accountability is to define desired outcomes, and hold districts accountable for reaching them. This makes sense if the best approach varies by local context and local actors have the best information about what works. Accountability will work better when the important outcomes are well-defined and well-measured and when the actors being held accountable have the capacity to change those outcomes.

Since the No Child Left Behind (NCLB) Act was signed into law in 2002, eligibility for most federal funds requires each state to submit an accountability plan. They must set curricular standards, test students on material corresponding to those standards, and make the testing data public.⁸ NCLB required every school to be on a path to have 100% of students meeting “proficiency” standards in a short time. As this proved wildly unrealistic, even considering the low proficiency standards set in many states, the U.S. Department of Education granted waivers to states exempting them from this requirement. When Congress reauthorized the law as the Every Student Succeeds Act (ESSA) of 2015, they removed the unenforceable consequences, but kept the standards, testing, and reporting requirements. Under both versions of the law, states develop their own accountability systems, subject to federal requirements such as reporting outcomes separately for student subgroups including by race and ethnicity, economic disadvantage, and disability status.

Research shows that these accountability regimes on average had modest positive impacts on test scores and induced some predictable perverse responses, such as teaching to the test, focusing instruction on students near the proficiency thresholds, and reduced emphasis on instruction in untested subjects and grades (Dee, Jacob, and Schwartz 2013). States crafted and implemented accountability in a range of ways; success was also variable (Dee and Dizon-Ross 2019; Bonilla and Dee 2020).

The 2015 reauthorization also changed the requirements for schools identified as needing improvement. NCLB offered four specific “turnaround” options, while ESSA is more flexible. A meta-analysis of NCLB school turnaround efforts finds they yielded only modest positive impacts on math, but points to promising practices: they found stronger impacts when efforts involved extending learning time or replacing a significant share of a school’s teaching staff (Henry et al. 2020).

8 The Common Core State Standards, which have been adopted by 41 states and the District of Columbia, were a collaborative cross-state effort and not a federal effort. These are curricular standards, specifying what students in different grades should learn in different subjects, rather than curricular materials that explain how students should be taught.

4.c.4. Using evidence

Federal policy encourages, and sometimes requires, states and districts to take “evidence-based” approaches to educating students. Louisiana has taken the further step of offering financial incentives for districts choosing evidence-based curricula from a state-provided list.

The idea that decisions should be evidence-based makes sense in the abstract but presents many practical challenges. Many widely used products and, more broadly, teaching strategies, have not been subject to rigorous study. The research base for many important practices is therefore thin and typically does not incorporate information on cost effectiveness. Research typically does not delineate the conditions under which the intervention was successful. At times, evidence-based approaches are incongruent with educators’ and parents’ strongly held beliefs or values; see, for example, recent debates around the “science of reading” (Hanford 2018).

There is a central tension in crafting policy about evidence use. Offering more flexibility, as with the federal approach, is important given the need to consider whether the research suggests an evidence-based approach makes sense in a specific local context. At the same time, education leaders have little time or research training, enhancing the appeal of simple lists. But not everything that works can be easily evaluated. The materials that can be most “cleanly” evaluated and marketed as evidence-based are those that limit teacher discretion, preventing potential gains from customization, and potentially making teaching less attractive as a profession for some.

5. Conclusion

We argue above that there is no silver bullet that will transform elementary and secondary education. Instead, we need to ensure students receive quality instruction by supporting the fundamentals, especially staffing. We also must identify particular schools and students in need of more targeted support and devote resources to them specifically. Advocates for equity should embrace the need to shore up schooling for everyone as essential to their cause: Without attention to staffing, core curriculum, and infrastructure, piling on more interventions is unlikely to help. This attention to fundamentals realistically constitutes a challenging and long-term agenda. In this section we summarize key principles to guide future efforts.

5.a. Recognize the key role of states

Throughout this chapter, we have emphasized variation across states and the power that state governments wield when it comes to education policy. The federal

government can play a key research and development function and provide funding, which is especially important in recessions (Henry et al. 2020). And attaching strings to federal aid has been a powerful tool for inducing particular policy changes in states and local districts, but it is a blunt instrument; federal policymakers can reasonably choose only a few strings at a time. School districts tax and spend, and schools are where the rubber hits the road, but states make most of the important rules.

5.b. Pay attention to fundamentals

While well-implemented, locally supported, evidence-based programs and interventions can be cost-effective tools, technocratic fixes cannot substitute for the fundamental work of “core instruction.” A focus on the basics is warranted; there is no substitute for effective teachers, supported by good principals and staff, working with a reasonable number of students, using a strong core curriculum, working in a well-maintained building with access to necessary technologies and supplies—including sufficient planning time. Students with disabilities, those learning English, and students who are not working at grade level for whatever reason should receive effective and appropriate intervention, but a quality core is critical and could reduce the need for intervention. States can support local districts as they work on these fundamentals; schools of education and unions should be critical partners in this work. Increased flexibility over the use of funds and, critically, making sure districts understand they can use categorical aid on core instruction could help.

- Every school needs a deep bench, with diverse, well-trained, and supported staff. Policies like creating career pathways for teachers, removing barriers to entering the teaching profession that are not associated with better teaching, ensuring student teachers are matched to effective supervisors, incentivizing teachers to stay in schools that have traditionally experienced high turnover, and building principal pipelines can help.
- Federal financing of critical improvements to school infrastructure, such as removing lead and updating HVAC systems, could make sense in light of low interest rates.

5.c. Increase emphasis on vulnerable students

Data and research related to students with disabilities, English learners, and American Indian and Alaska Native students are scarce, but the data we do have suggests these populations are often not being served well by our schools. Students who fall into more than one of these categories—for example English learners who also have learning disabilities—are particularly likely to have their needs

misidentified or overlooked. Sometimes, best practices for instruction or intervention are well understood in theory but have not been delivered effectively in practice. In any case, a new focus on these groups—including collecting better data, conducting more research, and better training teachers—is warranted.

5.d. Adopt proven policies and practices, mind the details

We should continue to encourage the thoughtful adoption of strategies that have been shown to work or might be expected to work based on what we know about learning. However, these efforts require greater attention to engaging with educators and communities to ensure the strategies can be implemented well and make sense in the local context.

We also need better and different research to realize the full potential of “evidence-based” practice. Most education research evaluates whether a particular approach was better than some unspecified, business-as-usual approach. Willingham and Daniel (2021) propose instead using research to identify “gold standard” options for different questions of practice based on cost-effectiveness so that new research can compare alternatives to best practice, rather than whatever happens to be in place.

5.e. Continue to focus on what happens out of school

In this chapter, we focus on schools. Public education has the potential to promote economic growth and equality, but policies addressing out of school factors may be equally or more important. Providing income support and access to health care, reducing exposure to lead, and reducing violence, including police violence against Black communities, among other things, could do more to improve learning than many of the education policies described above. And quality schools will be complementary with these other policies if they help students arrive at school more ready to learn.

References

- Abdulkadiroğlu, Atila, Parag A. Pathak, and Christopher R. Walters. 2018. "Free to Choose: Can School Choice Reduce Student Achievement?" *American Economic Journal: Applied Economics* 10 (1): 175–206. <https://doi.org/10.1257/app.20160634>.
- Ahn, June, and Andrew McEachin. 2017. "Student Enrollment Patterns and Achievement in Ohio's Online Charter Schools." *Educational Researcher* 46 (1): 44–57. <https://doi.org/10.3102/0013189X17692999>.
- Aizer, Anna, Janet Currie, Peter Simon, and Patrick Vivier. 2018. "Do Low Levels of Blood Lead Reduce Children's Future Test Scores?" *American Economic Journal: Applied Economics* 10 (1): 307–41. <https://doi.org/10.1257/app.20160404>.
- Andrews, Matthew, William Duncombe, and John Yinger. 2002. "Revisiting Economies of Size in American Education: Are We Any Closer to a Consensus?" *Economics of Education Review* 21 (3): 245–62. [https://doi.org/10.1016/S0272-7757\(01\)00006-1](https://doi.org/10.1016/S0272-7757(01)00006-1).
- Ang, Desmond. 2020. "The Effects of Police Violence on Inner-City Students." *The Quarterly Journal of Economics* 136 (1): 115–68. <https://doi.org/10.1093/qje/qjaa027>.
- Augustine, Catherine H., John Engberg, Geoffrey E. Grimm, Emma Lee, Elaine Lin Wang, Karen Christianson, and Andrea A. Joseph. 2018. "Can Restorative Practices Improve School Climate and Curb Suspensions?: An Evaluation of the Impact of Restorative Practices in a Mid-Sized Urban School District," December. https://www.rand.org/pubs/research_reports/RR2840.html.
- Bacher-Hicks, Andrew, Stephen B. Billings, and David J. Deming. 2019. "The School to Prison Pipeline: Long-Run Impacts of School Suspensions on Adult Crime." National Bureau of Economic Research working paper #26257. <https://doi.org/10.3386/w26257>.
- Bacher-Hicks, Andrew, Joshua Goodman, and Christine Mulhern. 2020. "Inequality in Household Adaptation to Schooling Shocks: Covid-Induced Online Learning Engagement in Real Time." National Bureau of Economic Research working paper #27555. <https://doi.org/10.3386/w27555>.
- Barrett, Nathan, Andrew McEachin, Jonathan N. Mills, and Jon Valant. 2019. "Disparities and Discrimination in Student Discipline by Race and Family Income." *Journal of Human Resources*, September, 0118-9267R2. <https://doi.org/10.3368/jhr.56.3.0118-9267R2>.
- Barrow, Lisa, Diane Whitmore Schanzenbach, and Amy Claessens. 2015. "The Impact of Chicago's Small High School Initiative." *Journal of Urban Economics* 87 (May): 100–113. <https://doi.org/10.1016/j.jue.2015.02.002>.
- Bergman, Peter, and Isaac McFarlin. 2020. "Education for All? A Nationwide Audit Study of School Choice," IZA DP #13007, 49.
- Bertrand, Melanie, and Julie Marsh. 2021. "How Data-Driven Reform Can Drive Deficit Thinking." *Phi Delta Kappan* 102 (8): 35–39. <https://doi.org/10.1177/00317217211013936>.
- Bonilla, Sade, and Thomas S. Dee. 2020. "The Effects of School Reform under NCLB Waivers: Evidence from Focus Schools in Kentucky," *Education Finance and Policy*, 15 (1): 75–103. <https://direct.mit.edu/edfp/article/15/1/75/10315/The-Effects-of-School-Reform-under-NCLB-Waivers>.

- Brunner, Eric, Joshua Hyman, and Andrew Ju. 2020. "School Finance Reforms, Teachers' Unions, and the Allocation of School Resources." *The Review of Economics and Statistics* 102 (3): 473–89. https://doi.org/10.1162/rest_a_00828.
- Burch, Patricia. 2009. *Hidden Markets: The New Education Privatization*. New York and London: Routledge.
- Card, David, and Abigail Payne. 2002. "School Finance Reform, the Distribution of School Spending, and the Distribution of Student Test Scores." *Journal of Public Economics* 83: 49–82.
- Carrell, Scott E., and Mark L. Hoekstra. 2010. "Externalities in the Classroom: How Children Exposed to Domestic Violence Affect Everyone's Kids." *American Economic Journal: Applied Economics* 2 (1): 211–28. <https://doi.org/10.1257/app.2.1.211>.
- Carrell, Scott E., Mark Hoekstra, and Elira Kuka. 2018. "The Long-Run Effects of Disruptive Peers." *American Economic Review* 108 (11): 3377–3415. <https://doi.org/10.1257/aer.20160763>.
- Carver-Thomas, Desiree, and Linda Darling-Hammond. 2017. "Teacher Turnover: Why It Matters and What We Can Do About It," Learning Policy Institute, 60.
- Cascio, Elizabeth, Nora Gordon, Ethan Lewis, and Sarah Reber. 2008. "From Brown to Busing." *Journal of Urban Economics* 64 (2): 296–325. <https://doi.org/10.1016/j.jue.2008.02.001>.
- Cascio, Elizabeth, Nora Gordon, and Sarah Reber. 2013. "Local Responses to Federal Grants: Evidence from the Introduction of Title I in the South." *American Economic Journal: Economic Policy* 5 (3): 126–59.
- Cascio, Elizabeth, and Sarah Reber. 2013. "The K-12 Education Battle." In *Legacies of the War on Poverty*, edited by Martha J. Bailey and Sheldon Danziger. Russell Sage Foundation.
- Chetty, Raj, John N. Friedman, and Jonah E. Rockoff. 2014. "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood." *American Economic Review* 104 (9): 2633–79. <https://doi.org/10.1257/aer.104.9.2633>.
- Chingos, Matthew M. 2013. "Class Size and Student Outcomes: Research and Policy Implications." *Journal of Policy Analysis and Management* 32 (2): 411–38. <https://doi.org/10.1002/pam.21677>.
- Chingos, Matthew, Tomás Monarrez, and Daniel Kuehn. 2019. "The Effects of the Florida Tax Credit Scholarship Program on College Enrollment and Graduation." Urban Institute. February 1, 2019. <https://www.urban.org/research/publication/effects-florida-tax-credit-scholarship-program-college-enrollment-and-graduation>.
- Cohodes, Sarah R., and Katharine S. Parham. 2021. "Charter Schools' Effectiveness, Mechanisms, and Competitive Influence." National Bureau of Economic Research working paper #28477. <https://doi.org/10.3386/w28477>
- Currie, Janet, and Johannes Schmieder. 2008. "Fetal Exposure to Toxic Releases and Infant Health." *American Economic Review*, 99 (2): 177–83. <https://doi.org/10.1257/aer.99.2.177>.
- Darling-Hammond, Linda, Maria E. Hyler, and Madelyn Gardner. 2017. "Effective Teacher Professional Development," Learning Policy Institute, 76.

- Dee, Thomas S., and Elise Dizon-Ross. 2019. "School Performance, Accountability, and Waiver Reforms: Evidence From Louisiana." *Educational Evaluation and Policy Analysis* 41 (3): 316–49. <https://doi.org/10.3102/0162373719849944>.
- Dee, Thomas S., and Dan Goldhaber. 2017. "Understanding and Addressing Teacher Shortages in the United States," Brookings Institute, The Hamilton Project, 28.
- Dee, Thomas S., Brian Jacob, and Nathaniel L. Schwartz. 2013. "The Effects of NCLB on School Resources and Practices," *Educational Evaluation and Policy Analysis*, 35 (2): 252–279. <https://journals.sagepub.com/doi/abs/10.3102/0162373712467080>.
- Dee, Thomas S., Jessalynn James, and Jim Wyckoff. 2021. "Is Effective Teacher Evaluation Sustainable? Evidence from District of Columbia Public Schools." *Education Finance and Policy* 16 (2): 313–46. https://doi.org/10.1162/edfp_a_00303.
- Dee, Thomas S., and Emily K. Penner. 2017. "The Causal Effects of Cultural Relevance: Evidence From an Ethnic Studies Curriculum." *American Educational Research Journal* 54 (1): 127–66. <https://doi.org/10.3102/0002831216677002>.
- . 2019. "My Brother's Keeper? The Impact of Targeted Educational Supports." w26386. National Bureau of Economic Research. <https://doi.org/10.3386/w26386>.
- Duflo, Esther, Pascaline Dupas, and Michael Kremer. 2011. "Peer Effects, Teacher Incentives, and the Impact of Tracking: Evidence from a Randomized Evaluation in Kenya." *American Economic Review* 101 (5): 1739–74. <https://doi.org/10.1257/aer.101.5.1739>.
- Epple, Dennis, Richard E. Romano, and Miguel Urquiola. 2017. "School Vouchers: A Survey of the Economics Literature." *Journal of Economic Literature* 55 (2): 441–92. <https://doi.org/10.1257/jel.20150679>.
- Figlio, David. 2017. "The Importance of a Diverse Teaching Force." *Brookings* (blog). November 16, 2017. <https://www.brookings.edu/research/the-importance-of-a-diverse-teaching-force/>.
- Figlio, David N., Paola Giuliano, Riccardo Marchingiglio, Umut Özek, and Paola Sapienza. 2021. "Diversity in Schools: Immigrants and the Educational Performance of U.S. Born Students." National Bureau of Economic Research working paper #28596. <https://doi.org/10.3386/w28596>.
- Fitzpatrick, Brian R., Mark Berends, Joseph J. Ferrare, and R. Joseph Waddington. 2020. "Virtual Illusion: Comparing Student Achievement and Teacher and Classroom Characteristics in Online and Brick-and-Mortar Charter Schools." *Educational Researcher* 49 (3): 161–75. <https://doi.org/10.3102/0013189X20909814>.
- Frankenberg, Erica, Genevieve Siegel-Hawley, Jia Wang, and Gary Orfield. 2012. "Choice Without Equity: Charter School Segregation and the Need for Civil Rights Standards," June. <https://escholarship.org/uc/item/4r07q8kg>.
- GAO. 2018a. "Discipline Disparities for Black Students, Boys, and Students with Disabilities." <https://www.gao.gov/assets/gao-18-258.pdf>.
- . 2018b. "Lead Testing of School Drinking Water Would Benefit from Improved Federal Guidance." <https://www.gao.gov/assets/gao-18-382.pdf>.
- . 2020. "School Districts Frequently Identified Multiple Building Systems Needing Updates or Replacement." <https://www.gao.gov/assets/gao-20-494.pdf>.

- Gates, Susan, Matthew Baird, Benjamin Master, and Emilio Chavez-Herrerias. 2019. *Principal Pipelines: A Feasible, Affordable, and Effective Way for Districts to Improve Schools*. RAND Corporation. <https://doi.org/10.7249/RR2666>.
- Gershenson, Seth, Michael Hansen, and Constance A. Lindsay. 2021. *Teacher Diversity and Student Success: Why Racial Representation Matters in the Classroom*.
- Gershenson, Seth, Cassandra M. D. Hart, Joshua Hyman, Constance Lindsay, and Nicholas W. Papageorge. 2018. "The Long-Run Impacts of Same-Race Teachers." National Bureau of Economic Research working paper #25254. <https://doi.org/10.3386/w25254>.
- Gershenson, Seth, and Laura Langbein. 2015. "The Effect of Primary School Size on Academic Achievement." *Educational Evaluation and Policy Analysis* 37 (1_suppl): 135S-155S. <https://doi.org/10.3102/0162373715576075>.
- Goldhaber, Dan, Cyrus Grout, and Kristian L. Holden. 2017. "Why Make It Hard for Teachers to Cross State Borders?" *Phi Delta Kappan* 98 (5): 55–60. <https://doi.org/10.1177/0031721717690367>.
- Goldhaber, Dan, Cyrus Grout, and Nick Huntington-Klein. 2017. "Screen Twice, Cut Once: Assessing the Predictive Validity of Applicant Selection Tools." *Education Finance and Policy* 12 (2): 197–223. https://doi.org/10.1162/EDFP_a_00200.
- Gordon, Nora. 2004. "Do Federal Grants Boost School Spending? Evidence from Title I." *Journal of Public Economics* 88 (9): 1771–92. <https://doi.org/10.1016/j.jpubeco.2003.09.002>.
- . 2017. "Education Funding: Tax Credits Cost the Federal Government Money | Econofact." March 21, 2017. <https://econofact.org/education-funding-tax-credits-cost-the-federal-government-money>.
- . 2018. "What Works vs. What We Can Evaluate." Brookings (blog). June 14, 2018. <https://www.brookings.edu/research/what-works-vs-what-we-can-evaluate/>.
- Gordon, Nora, and Eloise Pasachoff. 2018. "Fiscal Compliance Rules for Federal Funding of Elementary and Secondary Education: Transparency, Reason-Giving, and Agency Accountability." *The Oxford Handbook of U.S. Education Law*. December 11, 2018. <https://doi.org/10.1093/oxfordhb/9780190697402.013.9>.
- Gordon, Nora, and Sarah Reber. 2015. "The Quest for a Targeted and Effective Title I ESEA: Challenges in Designing and Implementing Fiscal Compliance Rules." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 1 (3): 129–47. <https://doi.org/10.7758/RSF.2015.1.3.07>.
- . 2020. "Supporting Students and Promoting Economic Recovery in the Time of COVID-19." Brookings (blog). May 7, 2020. <https://www.brookings.edu/blog/brown-center-chalkboard/2020/05/07/supporting-students-and-promoting-economic-recovery-in-the-time-of-covid-19/>.
- Gray, Abigail M, Philip M Sirinides, Ryan Fink, and Adrienne Flack. 2017. "Discipline in Context: Suspension, Climate, and PBIS in the School District of Philadelphia," *CPRE Research Reports*, retrieved from https://repository.upenn.edu/cpre_researchreports/106.
- Grissom, Jason A., and Christopher Redding. 2016. "Discretion and Disproportionality: Explaining the Underrepresentation of High-Achieving Students of Color in Gifted Programs." *AERA Open* 2 (1): 2332858415622175. <https://doi.org/10.1177/2332858415622175>.

- Gronberg, Timothy J., Dennis W. Jansen, Mustafa U. Karakaplan, and Lori L. Taylor. 2015. "School District Consolidation: Market Concentration and the Scale-Efficiency Tradeoff." *Southern Economic Journal* 82 (2): 580–97.
- Hanford, Emily. 2018. "Why Aren't Kids Being Taught to Read?" September 10, 2018. <https://www.apmreports.org/episode/2018/09/10/hard-words-why-american-kids-arent-being-taught-to-read>.
- Hanushek, Eric A. 1997. "Assessing the Effects of School Resources on Student Performance: An Update." *Educational Evaluation and Policy Analysis* 19 (2): 141–64. <https://doi.org/10.3102/01623737019002141>.
- Hardy, Bradley L, Trevon D Logan, and John Parman. 2018. "The Historical Role of Race and Policy for Regional Inequality," Brookings Institute, The Hamilton Project, 23.
- Henry, Gary T., Lam D. Pham, Adam Kho, and Ron Zimmer. 2020. "Peeking Into the Black Box of School Turnaround: A Formal Test of Mediators and Suppressors." *Educational Evaluation and Policy Analysis* 42 (2): 232–56. <https://doi.org/10.3102/0162373720908600>.
- Jackson, C. Kirabo, and Claire Mackevicius. 2021. "The Distribution of School Spending Impacts." National Bureau of Economic Research working paper #28517. <https://doi.org/10.3386/w28517>.
- Jacob, Brian A, and Jonah E Rockoff. 2011. "Organizing Schools to Improve Student Achievement: Start Times, Grade Configurations, and Teacher Assignments," Brookings Institute, The Hamilton Project, 28.
- Jacob, Brian A., Jonah E. Rockoff, Eric S. Taylor, Benjamin Lindy, and Rachel Rosen. 2018. "Teacher Applicant Hiring and Teacher Performance: Evidence from DC Public Schools." *Journal of Public Economics* 166 (October): 81–97. <https://doi.org/10.1016/j.jpubeco.2018.08.011>.
- Johnson, Rucker C., and Alexander Nazaryan. 2019. *Children of the Dream: Why School Integration Works*. Basic Books.
- Kaufman, Julia, John Davis, Elaine Wang, Lindsey Thompson, Joseph Pane, Katherine Pfrommer, and Mark Harris. 2017. *Use of Open Educational Resources in an Era of Common Standards: A Case Study on the Use of EngageNY*. RAND Corporation. <https://doi.org/10.7249/RR1773>.
- Kearney, Melissa, and Phillip Levine. 2016. "Income Inequality, Social Mobility, and the Decision to Drop Out of High School." *Brookings Papers on Economic Activity* 2016 (March): 333–96. <https://doi.org/10.1353/eca.2016.0017>.
- Kho, Adam. 2021. "Evaluating Claims That Charter Schools Practice 'Cream Skimming' and 'Pushout.'" *Education Next* (blog). February 24, 2021. <https://www.educationnext.org/do-charter-schools-cream-skim-high-achievers-push-out-low-performing-students/>.
- Kraft, Matthew A., and Allison F. Gilmour. 2017. "Revisiting The Widget Effect: Teacher Evaluation Reforms and the Distribution of Teacher Effectiveness." *Educational Researcher* 46 (5): 234–49. <https://doi.org/10.3102/0013189X17718797>.
- Krueger, Alan B. 1999. "Experimental Estimates of Education Production Functions." *The Quarterly Journal of Economics* 114 (2): 497–532.

- Lafortune, Julien, Jesse Rothstein, and Diane Whitmore Schanzenbach. 2018. "School Finance Reform and the Distribution of Student Achievement." *American Economic Journal: Applied Economics* 10 (2): 1–26. <https://doi.org/10.1257/app.20160567>.
- Lindsay, Constance A., and Cassandra M. D. Hart. 2017. "Exposure to Same-Race Teachers and Student Disciplinary Outcomes for Black Students in North Carolina." *Educational Evaluation and Policy Analysis* 39 (3): 485–510. <https://doi.org/10.3102/0162373717693109>.
- Magnuson, K., and J. Waldfogel. 2008. *Steady Gains and Stalled Progress: Inequality and the Black-White Test Score Gap*. Book Collections on Project MUSE. Russell Sage Foundation. <https://books.google.com/books?id=lNAEyVdBEQUc>.
- Mavrogordato, Madeline, Rebecca Callahan, David DeMatthews, and Elena Izquierdo. 2021. "SUPPORTS FOR STUDENTS WHO ARE ENGLISH LEARNERS," EdResearch for Recovery, Brief No. 15, 6.
- Monarrez, Tomás. 2019. "Do Charter Schools Increase Segregation?" *Education Next* (blog). July 24, 2019. <https://www.educationnext.org/do-charter-schools-increase-segregation-first-national-analysis-reveals-modest-impact/>.
- . 2021. "School Attendance Boundaries and the Segregation of Public Schools in the US," 66.
- Mulhern, Christine. 2020. "Beyond Teachers: Estimating Individual Guidance Counselors' Effects on Educational Attainment," 76.
- Nelson, Charles A., Zulfiqar A. Bhutta, Nadine Burke Harris, Andrea Danese, and Muthanna Samara. 2020. "Adversity in Childhood Is Linked to Mental and Physical Health throughout Life." *BMJ* 371 (October): m3048. <https://doi.org/10.1136/bmj.m3048>.
- Nomi, Takako. 2009. "The Effects of Within-Class Ability Grouping on Academic Achievement in Early Elementary Years." *Journal of Research on Educational Effectiveness* 3 (1): 56–92. <https://doi.org/10.1080/19345740903277601>.
- Northern, Amber M., Janie Scull, and Dara Zeehandelaar Shaw. 2012. "How Strong Are U.S. Teacher Unions? A State-By-State Comparison." The Thomas B. Fordham Institute. Accessed May 29, 2021. <https://fordhaminstitute.org/national/research/how-strong-are-us-teacher-unions-state-state-comparison>.
- Office of Management and Budget. 1997. "Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity." Accessed May 30, 2021. <https://obamawhitehouse.archives.gov/node/15626>.
- Park, R. Jisung, A. Patrick Behrer, and Joshua Goodman. 2021. "Learning Is Inhibited by Heat Exposure, Both Internationally and within the United States." *Nature Human Behaviour* 5 (1): 19–27. <https://doi.org/10.1038/s41562-020-00959-9>.
- Park, R. Jisung, Joshua Goodman, Michael Hurwitz, and Jonathan Smith. 2020. "Heat and Learning." *American Economic Journal: Economic Policy* 12 (2): 306–39. <https://doi.org/10.1257/pol.20180612>.
- Parolin, Zachary, and Emma K. Lee. 2021. "Large Socio-Economic, Geographic and Demographic Disparities Exist in Exposure to School Closures." *Nature Human Behaviour* 5 (4): 522–28. <https://doi.org/10.1038/s41562-021-01087-8>.

- Polikoff, Morgan, Elaine Lin Wang, and Julia H. Kaufman. 2021. "The Overlooked Support Teachers Are Missing: A Coherent Curriculum." March 3, 2021. <https://www.rand.org/blog/2021/03/the-overlooked-support-teachers-are-missing-a-coherent.html>.
- Pomerance, L, and K Walsh. 2020. "Clinical Practice and Classroom Management." https://www.nctq.org/review/docs/NCTQ%202020%20Teacher%20Prep%20Review_Clinical%20Practice%20and%20Classroom%20Management_Final_10.19.pdf.
- Pope, Nolan G, and George W Zuo. 2020. "Suspending Suspensions: The Education Production Consequences of School Suspension Policies," 49.
- Reardon, Sean F. 2019. "Educational Opportunity in Early and Middle Childhood: Using Full Population Administrative Data to Study Variation by Place and Age." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 5 (2): 40–68. <https://doi.org/10.7758/RSF.2019.5.2.03>.
- Reber, Sarah J. 2005. "Court-Ordered Desegregation Successes and Failures Integrating American Schools since Brown versus Board of Education." *Journal of Human Resources* XL (3): 559–90. <https://doi.org/10.3368/jhr.XL.3.559>.
- . 2010. "School Desegregation and Educational Attainment for Blacks." *Journal of Human Resources* 45 (4): 893–914. <https://doi.org/10.3368/jhr.45.4.893>.
- . 2011. "From Separate and Unequal to Integrated and Equal? School Desegregation and School Finance in Louisiana." *The Review of Economics and Statistics* 93 (2): 404–15. https://doi.org/10.1162/REST_a_00090.
- Reckhow, Sarah, Megan Tompkins-Stange, and Sarah Galey-Horn. 2021. "How the Political Economy of Knowledge Production Shapes Education Policy: The Case of Teacher Evaluation in Federal Policy Discourse." *Educational Evaluation and Policy Analysis*, April, 01623737211003906. <https://doi.org/10.3102/01623737211003906>.
- Ritter, Gary. 2010. "A Closer Look at Charter Schools and Segregation." *Education Next* (blog). April 27, 2010. <https://www.educationnext.org/a-closer-look-at-charter-schools-and-segregation/>.
- Ronfeldt, Matthew, Stacey L. Brockman, and Shanyce L. Campbell. 2018. "Does Cooperating Teachers' Instructional Effectiveness Improve Preservice Teachers' Future Performance?" *Educational Researcher* 47 (7): 405–18. <https://doi.org/10.3102/0013189X18782906>.
- Ronfeldt, Matthew, Susanna Loeb, and James Wyckoff. 2013. "How Teacher Turnover Harms Student Achievement." *American Educational Research Journal* 50 (1): 4–36. <https://doi.org/10.3102/0002831212463813>.
- Roza, Marguerite, Katherine Hagan, and Laura Anderson. 2021. "Variation Is the Norm: A Landscape Analysis of Weighted Student Funding Implementation." *Public Budgeting & Finance* 41 (1): 3–25. <https://doi.org/10.1111/pbaf.12276>.
- Sacerdote, Bruce. 2011. "Chapter 4 - Peer Effects in Education: How Might They Work, How Big Are They and How Much Do We Know Thus Far?" In *Handbook of the Economics of Education*, edited by Eric A. Hanushek, Stephen Machin, and Ludger Woessmann, 3:249–77. Elsevier. <https://doi.org/10.1016/B978-0-444-53429-3.00004-1>.
- Schrag, Peter. 2006. "Policy from the Hip: Class-Size Reduction in California." *Brookings Papers on Education Policy*, no. 9: 229–43.

- Schwartz, Amy Ellen, Jeffrey Zabel, and Michele Leardo. 2017. "Class Size and Resource Allocation: ESE Policy Brief," Massachusetts Department of Elementary and Secondary Education.
- Setren, Elizabeth. Forthcoming. "Targeted vs. General Education Investments: Evidence from Special Education and English Language Learners in Boston's Charter Schools." *Journal of Human Resources*, forthcoming.
- Shores, Kenneth A., Christopher A. Candelaria, and Sarah E. Kabourek. 2020. "Spending More on the Poor? A Comprehensive Summary of State-Specific Responses to School Finance Reforms from 1990–2014." *EdWorkingPapers.Com*. Annenberg Institute at Brown University. <https://www.edworkingpapers.com/ai19-52>.
- Staiger, Douglas O, and Jonah E Rockoff. 2010. "Searching for Effective Teachers with Imperfect Information." *Journal of Economic Perspectives* 24 (3): 97–118. <https://doi.org/10.1257/jep.24.3.97>.
- Stafford, Tess M. 2015. "Indoor air quality and academic performance," *Journal of Environmental Economics and Management* 70 (March): 34–50.
- Stoddard, Christiana, and Eugenia F. Toma. 2021. "Introduction to Special Topic: Rural Education Finance and Policy." *AERA Open* 7 (January): 23328584211011610. <https://doi.org/10.1177/23328584211011607>.
- Taylor, Eric S, and John H Tyler. 2012. "The Effect of Evaluation on Teacher Performance." *American Economic Review* 102 (7): 3628–51. <https://doi.org/10.1257/aer.102.7.3628>.
- Thompson, Owen. 2020. "School Desegregation and Black Teacher Employment." *The Review of Economics and Statistics*, October, 1–45. https://doi.org/10.1162/rest_a_00984.
- Tuttle, Cody. 2019. "The Long-Run Economic Effects of School Desegregation." SSRN Scholarly Paper ID 3460993. Rochester, NY: Social Science Research Network. <https://papers.ssrn.com/abstract=3460993>.
- Whitehurst, Grover J. "Russ." 2009. "Don't Forget Curriculum." *Brookings* (blog). October 14, 2009. <https://www.brookings.edu/research/dont-forget-curriculum/>.
- Zilbermints, Regina. 2021. "White House Defends CDC Outreach to Teachers Union." *The Hill*. May 4, 2021. <https://thehill.com/homenews/administration/551743-white-house-defends-cdc-outreach-to-teachers-union-in-developing>.