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with research support from  
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# Common Core State Standards in California

## Evaluating Local Implementation and Student Outcomes



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## SUMMARY

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Technical appendices to this report are available on the PPIC website.

In 2010, California adopted the Common Core State Standards for math and English. The new standards are part of a state effort to prepare students for college and careers in the 21st-century global economy and narrow longstanding achievement gaps. The state’s implementation is complete, but because districts decide whether and when they will adopt the standards, far less is known about local efforts. So it is still unclear whether the Common Core standards are succeeding.

In early 2019, we surveyed school districts to gauge their progress on Common Core implementation. We then used statewide data and examined the differences in local textbook adoption to understand the effects of CCSS implementation on student outcomes. This report details our findings:

- **Progress is uneven.** Seventy percent of respondents have aligned their curricula, instructional materials, and local assessments with the standards—more so in English than in math. However, 30 percent have not yet started, and the share is higher among rural high schools.
- **Most districts implemented recently.** Most districts aligned their curricula and textbooks in or after the first year that the new Smarter Balanced assessments (SBAC) were administered (2014–15). Local adoption often occurs in phases, starting with certain grades or subjects and spreading to others over time.
- **Instructional practices lag behind.** Most teachers have not fully aligned their classroom instruction with the new standards. This alignment is key to achieving desired student outcomes. On average, more progress has been made among English teachers than math teachers.
- **We find modest improvements among elementary and middle school students in districts that have adopted the standards.** Districts that adopted the Common Core standards saw a 2–3 percent increase in the share of students at or above English proficiency on SBAC. Middle school math proficiency increased by just under 2 percent; elementary math results were insignificant. Gains were similar across most major student subgroups, though they were slightly larger among low-income and Latino students.
- **The impact of the standards in high schools is inconclusive.** We found no overall effect on graduation rates, the share of students taking or passing Advanced Placement courses, the share of students taking the SAT exams, or the share completing the “a–g” courses required by California’s four-year public universities.

These findings point to several steps the state can take to help districts implement the standards.

- **Invest in programs to monitor local implementation and provide continuous support.** In particular, the state could leverage its networks to provide targeted assistance to late/non-adopters and rural schools.
- **Provide more guidance about quality, content-based, professional development, especially for math teachers.** The state also needs to identify and invest in innovative programs that can deliver high-quality training to remote areas.
- **Collaborate with researchers and educators to identify effective system shifts that may be scalable across the state.** These may include principal leadership, community engagement, and data-driven decision-making.

As the state continues to support Common Core implementation, policymakers should not assume that local districts are able to implement these and other new standards without extra help or encouragement. Tracking and assisting district implementation would go a long way toward improving standards adoption. It would also help us to better understand what is working—and what is not.

# Introduction

Since the 1990s the U.S. has adopted standards-based reforms—high academic expectations assessed through standardized tests—to improve student outcomes and to close achievement gaps. The Common Core State Standards are the latest of these efforts. Begun in 2009 as a joint initiative (National Governors Association and Council of Chief State School Officers), they are a voluntary, state-led effort to establish a common set of standards that specify the skills and knowledge students should acquire in order to be college- and career-ready in the 21st-century global economy (NGA 2010). Since 2010, more than 40 states have adopted Common Core (Achieve 2013). Due to political backlash, state legislation, and other factors, 11 of these states have changed or replaced the standards (Education Week 2017). Support for Common Core remains strong among Californians (Baldassare et al. 2019).

In 2010, California adopted Common Core to replace its 1997 standards in mathematics and English language arts. The differences are significant. In math, the new standards place greater emphasis on mathematical integrity, e.g., precise definitions, logical reasoning, and application of mathematical thinking to real world problems (Hess 2011; Wu 2014; CDE 2014). In English, they stress nonfiction texts and require students to think more critically and use evidence to support their positions (CDE 2014; Harrington 2017).

Common Core implementation is one of the eight state priorities identified under California’s new educational accountability policy. Districts are required to address standards implementation in Local Control and Accountability Plans (LCAP). Curriculum, assessments, instructional materials, and professional development must be designed to support and achieve new standards. That means most K–12 policies and practices at both state and local levels will have to change to align with Common Core (Kirst 2013; Perry, Maple, and Reade 2019). The state legislature appropriated \$1.25 billion to provide professional development for teachers and administrators (29%), to develop instructional materials aligned with the standards (26%), and to update technology infrastructure to accommodate the new computer-based assessments (44%) (CDE 2013b, 2015).

According to California’s CCSS Systems Implementation Plan, full implementation—in which local districts completely align and effectively integrate curriculum, instruction, and assessments—will span several years and requires continuous improvement over time. The state defined three characteristic phases (CDE 2014):

- **Awareness:** Key activities include introduction of the new standards, initial implementation planning, and establishment of collaboration efforts.
- **Transition:** Districts concentrate on building foundational resources, conducting needs assessments, establishing new professional learning opportunities, and expanding collaboration between all stakeholders.
- **Implementation:** This signals a more complete integration of the new standards into local academic processes. Districts expand the new professional learning support, fully align curriculum, instruction, and assessments, and effectively integrate these elements across the field.

Common Core implementation consists of efforts at both the state and district levels, which do not happen concurrently. The state’s implementation is by and large complete, despite the delays in key activities such as the development and adoption of instructional frameworks (Figure 1).<sup>1</sup> On the other hand, little systematic information has been collected about the district process and the extent of implementation across the state. Early evidence characterizes it as segmented—districts adopted the standards in certain grades/subjects first (Finkelstein et al. 2018; CCSESA 2013).

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<sup>1</sup> The state legislature passed a series of laws that suspended the development of curriculum framework and the adoption of instructional materials until 2015. Several bills passed later on reversed the course and sped up the implementation process (CDE 2014).

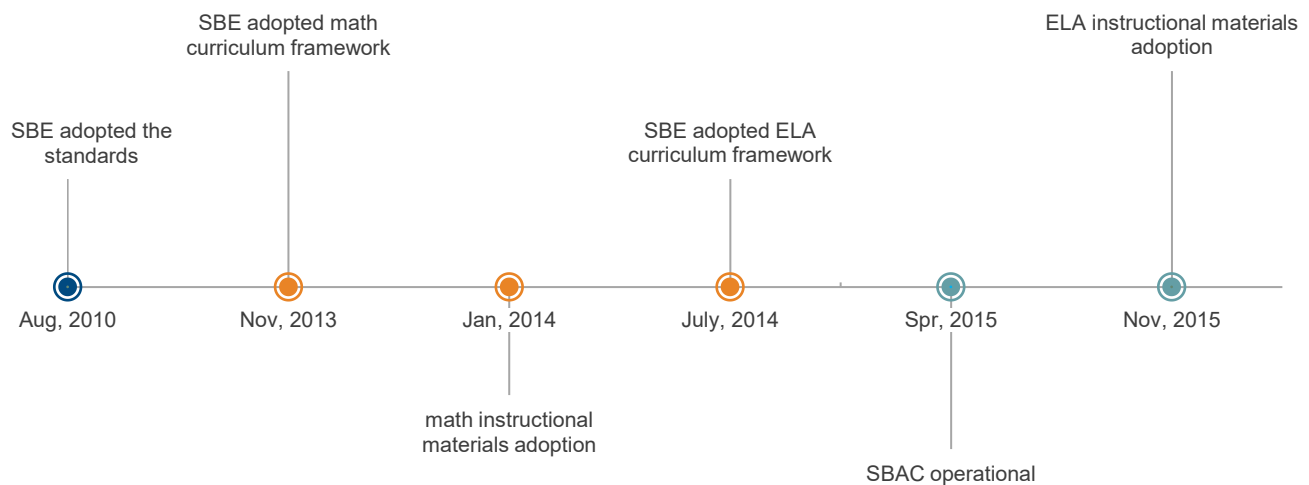
Two issues plague attempts to evaluate whether Common Core is accomplishing the student outcomes for which it was created.<sup>2</sup> First, as Figure 1 illustrates, standards adoption is not synonymous with standards implementation. Although the standards were adopted in 2010, key implementation activities—including the development/adoption of curriculum frameworks, the approval of instructional materials, and the alignment of standardized assessments—did not occur until several years later. Second, the district implementation timeline, which is key to evaluation, is largely unknown.

California has a complex educational governance structure that involves a wide range of agencies including the State Board of Education (SBE), California Department of Education (CDE), county offices of education, and local districts. The SBE decides on the standards and curriculum frameworks, which provide implementation guidelines to local districts and set criteria for textbook publishers, but local districts decide *whether* and *when* to implement the new standards in their districts.

Since the state does not collect any data pertaining to the implementation process, it is very difficult to identify local timelines. To date, little is known about the total number of districts that have adopted the new standards, and the extent to which they have been implemented. For these reasons, even less is known about the reforms’ effects on California’s students. Recent test score data, which shows significant progress in English but stalled gains in math (Warren and Lafortune 2019), calls for a closer look at district-level standards implementation.

**FIGURE 1**

Implementation started several years after the state adopted Common Core



SOURCE: California Department of Education, 2010 – 2015.

NOTE: SBAC = Common Core-aligned summative assessments developed by the Smarter Balanced Assessment Consortium (SBAC). SBE = State Board of Education

To assess how district implementation is progressing, we launched a broad statewide survey in early 2019—polling 181 districts that serve half of California’s K–12 population. We asked about the alignment of curriculum, instructional materials, local assessments, professional development for teachers and administrators, and—most importantly—classroom instruction. The vast majority (77%) of the respondents are in high-need districts—where more than 55 percent of their students are low-income, English Learners, homeless, and/or foster youth. More than 90 percent

<sup>2</sup> CCSS implementation studies have shown varying degrees of implementation across and within states (Warren and Murphy, 2014; Korn, Gamboa and Polikoff, 2016; Kaufman, Opfer, Pane and Thompson 2018, CCSESA 2013; Polikoff 2017; Finkelstein et al. 2018; McCormick and James 2018; Korn, et al. 2016). Evaluation studies show mixed results of CCSS adoption ranging from negative to positive effects on student outcomes (Loveless 2015, 2016; Xu and Cepa 2015; Song, Yang and Garet 2019).

of them are either very familiar (63%) or familiar (33%) with their district’s implementation. The majority are teachers (44%), district administrators (25%), and school administrators (25%).<sup>3</sup>

To examine the relationship between Common Core implementation and student outcomes, we analyze School Accountability Report Cards (SARCs), which include information about textbook titles and years of adoption, to identify local timelines.<sup>4</sup> We use the years in which districts adopted Common Core–aligned textbooks as our measure of local implementation. For elementary and middle school students, we look at performance on state standardized assessments. For high school students, we look at enrollment in and performance on the Advanced Placement (AP) exams, high school graduation, completion of a–g course requirements, and participation in the SAT exams.<sup>5</sup>

## Progress in District Implementation Is Uneven

California still has a long way to go to ensure that all students are learning effectively with Common Core. Although 70 percent of districts have begun the implementation process, 30 percent have not. And most districts did not begin implementation until or after the first year of SBAC testing (2014–15), which means any examination of the effects of Common Core standards on student outcomes will be preliminary at best.

The good news is that implementing districts have made progress in aligning curricula, instructional materials, and local assessments. But instructional shifts in classrooms are critical to success, and more professional development is needed to help teachers effectively make these changes.

**TABLE 1**  
Most of the respondent districts were in the implementation phase in 2019

	Elementary grades	Middle school grades	High school grades
Awareness	6%	4%	6%
Transition	25%	24%	22%
Implementation	69%	72%	72%

SOURCE: PPIC Common Core Implementation Survey, 2019.

NOTES: Numbers are weighted by inverse probability of response. Sample is restricted to respondents who are familiar or very familiar with their districts’ implementation.

<sup>3</sup> To mitigate concerns over non-response, we use inverse probability weighting (IPW) when analyzing the survey data. For instance, small and rural districts, which are less likely to respond to our surveys, are assigned a greater weight than their large and urban counterparts. For more details about our survey design, data collection, respondent analysis, and survey instruments, please refer to [Technical Appendix C](#). General consensus in the literature suggests the use of sampling weights to obtain consistent estimates of univariate population characteristics (such as means and proportions); however, there is less consensus on whether weights should be routinely used in multivariate models, such as regression (Kish and Frankel, 1974; Winship and Radbill 1994; Gelman 2007; Solon, Haider, and Wooldridge 2015).

<sup>4</sup> Per the Williams Act, all schools in California are required to report their textbook titles and adoption years in their annual School Accountability Report Card. We wrote a Python script to obtain all SARC reports for the 2017–18 school year. We then applied several simple Natural Language Processing tools to extract adoption years and determine whether or not the textbooks are aligned with the Common Core. For K–8, we matched the textbook titles and publishers to the state’s approved list. Since the state does not adopt textbooks for high schools, we performed a manual check—the textbook market is dominated by a few major publishers, so this was not a particularly painful process.

<sup>5</sup> Common Core State Standards have been the subject of heated debates since their inception. Critics argue that the standards are not appropriately set or that they are not internationally benchmarked (Supovitz, Daly, and del Fresno 2015; Milgram and Stotsky 2013). In this report, we make no attempts to compare them to other standards or to judge the quality of the standards per se; instead, we ask the following question: If implemented, do the standards have any effects on student outcomes?

# Most Implementing Districts Have Aligned Curricula, Instructional Materials, and Local Assessments

More than 90 percent of implementing districts reported having aligned their curricula and instructional materials with the standards—an important first step. Fewer (72%–88%) have aligned their local assessments such as final exams and district benchmarks. The level of curriculum alignment is slightly higher in English than in math (Table 2).

District textbook approval does not necessarily mean all students have access to them. So we asked about the extent to which textbooks aligned with the standards are used in classrooms. About 90 percent of districts reported use in almost all classrooms (Figure 2). The number is slightly lower in English because many high schools do not use textbooks for that subject. Overall, this is good news: it represents a significant increase from 2013, when less than a third of districts reported using aligned textbooks in nearly all classrooms (CDE 2013a).

**TABLE 2**  
Percentage of implementing districts reporting standards alignment

	Math	ELA
Curriculum	94%	95%
Instructional materials	94%	83%
Formative assessments (e.g., in-class quizzes)	86%	88%
Summative assessments (e.g., final exams)	72%	85%
District placement assessments (e.g., algebra readiness)	72%	NA

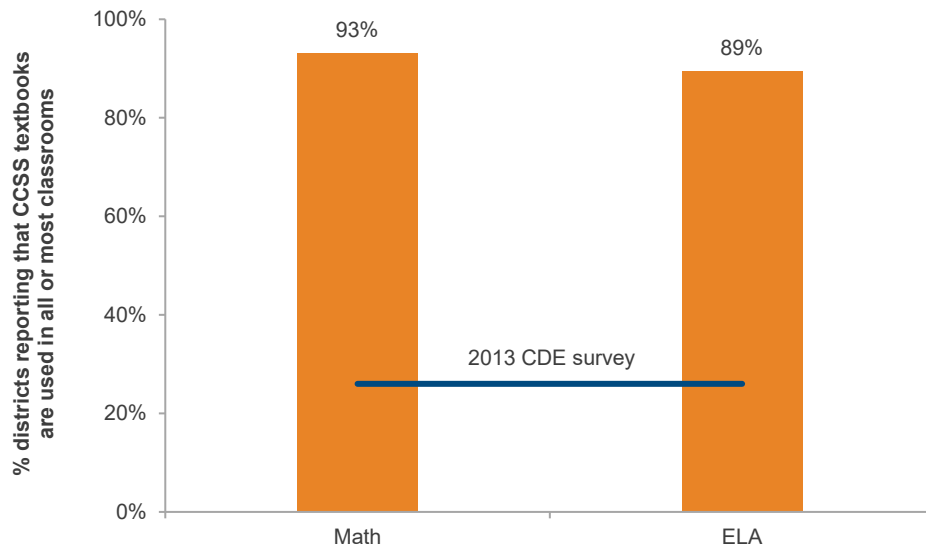
SOURCE: PPIC Common Core Implementation Survey, 2019.

NOTES: Numbers are weighted by inverse probability of response. Sample is restricted to respondents who are familiar or very familiar with their districts' implementation. We also excluded districts that were not in the implementation phase at the time of survey. In nearly all cases, there was no significant variation by district size or geographic location. High-need districts were less likely to align their summative assessments in both subjects. The correlation between curriculum/course model and instructional materials is high (0.7 in math and 0.8 in ELA), which validates our approach of using textbook adoption as a proxy for full adoption.



**FIGURE 2**

Nearly all classrooms in implementing districts used textbooks aligned with Common Core



SOURCES: PPIC Common Core Implementation Survey, 2019; CDE Common Core State Standards Implementation Survey, 2013.

NOTES: Numbers are weighted by inverse probability of response. Sample is restricted to respondents who are familiar or very familiar with their districts' implementation. We also excluded districts that were not in the implementation phase at the time of survey. In all cases, there was no significant variation by district size, high-need students share, or geographic location.

## Most Teachers and Administrators Received Training, but More Is Needed

Successful Common Core implementation requires effective teacher training in the new standards and related content. During the 2018–19 school year, most elementary, math, and English teachers received 9 to 32 hours of training.<sup>6</sup> Math instructional coaches, special education teachers, and school administrators tended to receive less (Table 3). Districts provided most of the professional development. The main funding sources were the base grant from the Local Control Funding Formula (33% of respondents), the state's Educator Effectiveness funds (29%), and the federal Title I program (27%).

Is one to four days of Common Core Standards training sufficient to prepare educators adequately? Research has shown that greater than 14 hours of professional development has a positive effect on student achievement (Yoon et al. 2007). But it also suggests that to change teachers' instructional behaviors requires a minimum of 80 intensive hours. And it takes another 80 hours on top of that to change the classroom environment (Supovitz and Turner 2000; Kennedy 1998; Clewell et al. 2005).

Content also matters. Professional development related to knowledge of subject matter, curriculum, and/or to how students learn the subject is more effective than that focusing only on teaching behaviors (McCaffrey, Hamilton, and Stecher 2001; Cohen and Hill 1998). This may pose a particular challenge for math teachers—teaching Common Core math effectively requires sustained content training (Wu 2011).

<sup>6</sup> This is roughly on par with the national average (NCES 2017).

**TABLE 3**

Hours of Common Core training for teachers and administrators, 2018–19

	None	1–8 hours	9–32 hours	> 32 hours	NA
Elementary teachers	0%	26%	58%	4%	12%
Math teachers	4%	20%	61%	7%	7%
Math coach	7%	13%	42%	15%	23%
ELA teachers	3%	21%	65%	3%	8%
Other teacher	8%	27%	55%	0%	9%
Special education teacher	9%	40%	48%	0%	2%
Administrators	5%	47%	42%	6%	1%

SOURCE: PPIC Common Core Implementation Survey, 2019.

NOTES: Numbers are weighted by inverse probability of response. Sample is restricted to (1) respondents who are familiar or very familiar with their districts' implementation and (2) districts that were in the implementation phase at the time of survey. Sample is too small (~60) for any meaningful breakdowns.

## Some Rural Districts Have Not Started Implementation

As we have demonstrated above, in early 2019 close to 70 percent of districts reported being in the implementation phase (Table 1). This represents a marked improvement from six years ago, when most districts were either in the awareness (30%) or transition (64%) phase (CCSESA 2013; CDE 2013a). Even so, at the time of survey about 30 percent of districts had not yet started their implementation. We saw no significant variation by district size or student composition to explain this—small districts and high-need districts were just as likely to be in the implementation phase.

The biggest differentiator turns out to be geography. Rural districts are less likely to implement the standards in high schools. There are many potential reasons for the lack of progress in rural areas. Rural districts tend to have fewer resources (NCES 2007). It is particularly challenging to provide professional development due to remote locations. Rural areas commonly have multiple K–8 districts feeding into one high school district. This means the vertical alignment between K–8 and high schools may be lower.

All of this raises concerns about student outcomes in these high schools. Further work is necessary to understand the challenges rural districts face and the support needed to help the many districts still struggling to implement the new standards.

## For Many Districts, Full Implementation Is Still Years Away

California's Common Core implementation plan calls for a system of profound changes that will take years to complete (CDE 2014). Local districts have made encouraging steps in that direction. But a deeper dive into the key alignment areas suggests that full implementation is still years away for many of them. As our survey demonstrated, 30 percent of districts have not even started. Most of those that have are still in the early stages—they did not align their curriculum until 2015, when SBAC testing began. Textbook adoption—particularly in English—happened even later. More critically, most math and English teachers have not yet fully integrated the standards into their instructional practices, particularly in math, partly due to its more technical nature.

## Key alignments did not happen until the first year of testing

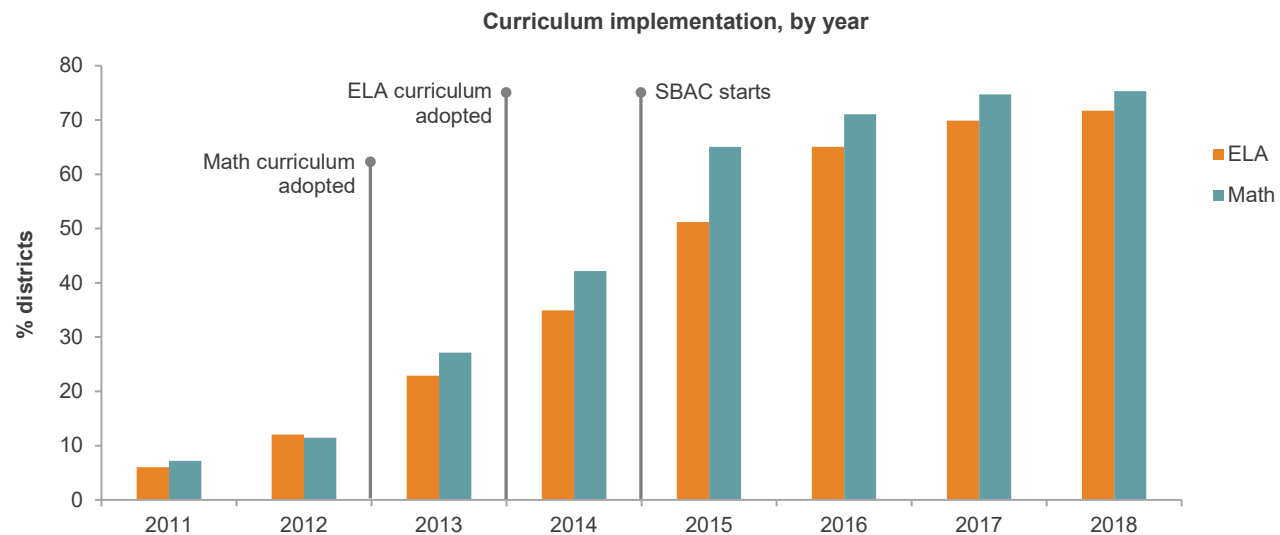
Although California adopted Common Core Standards in 2010, local adoption of curriculum/course models and textbooks did not happen until or after the first year of SBAC testing (2014–15) (Figures 3 and 4). This understandably raises concerns about the relationship between students’ exposure to the new standards and the interpretation of the first year of SBAC results. Part of this was due to the delays in the state’s timeline.

The California Education Code calls for instructional materials adoption to occur every eight years. The State Board of Education approves instructional materials for K–8; however, it does not have the authority to do so for high schools, leaving the responsibility to local districts. In 2009, the state enacted a series of laws that suspended the development of instructional frameworks, which would provide guidance for implementing the new standards and set criteria for textbook publishers (CDE 2014). The process resumed in 2012.

After the state adopted the new math (2013) and English (2014) curriculum frameworks, many more districts aligned their curricula (Figure 3).

**FIGURE 3**

Most students were not exposed to Common Core curriculum before the first year of SBAC testing, 2011–12 to 2018–19



SOURCE: PPIC Common Core Implementation Survey, 2019.

NOTES: Sample restricted to (1) respondents who are familiar or very familiar with their districts’ implementation and (2) districts that were in the implementation phase at the time of the survey. There is no significant variation based on district size, share of high-need students, or location.

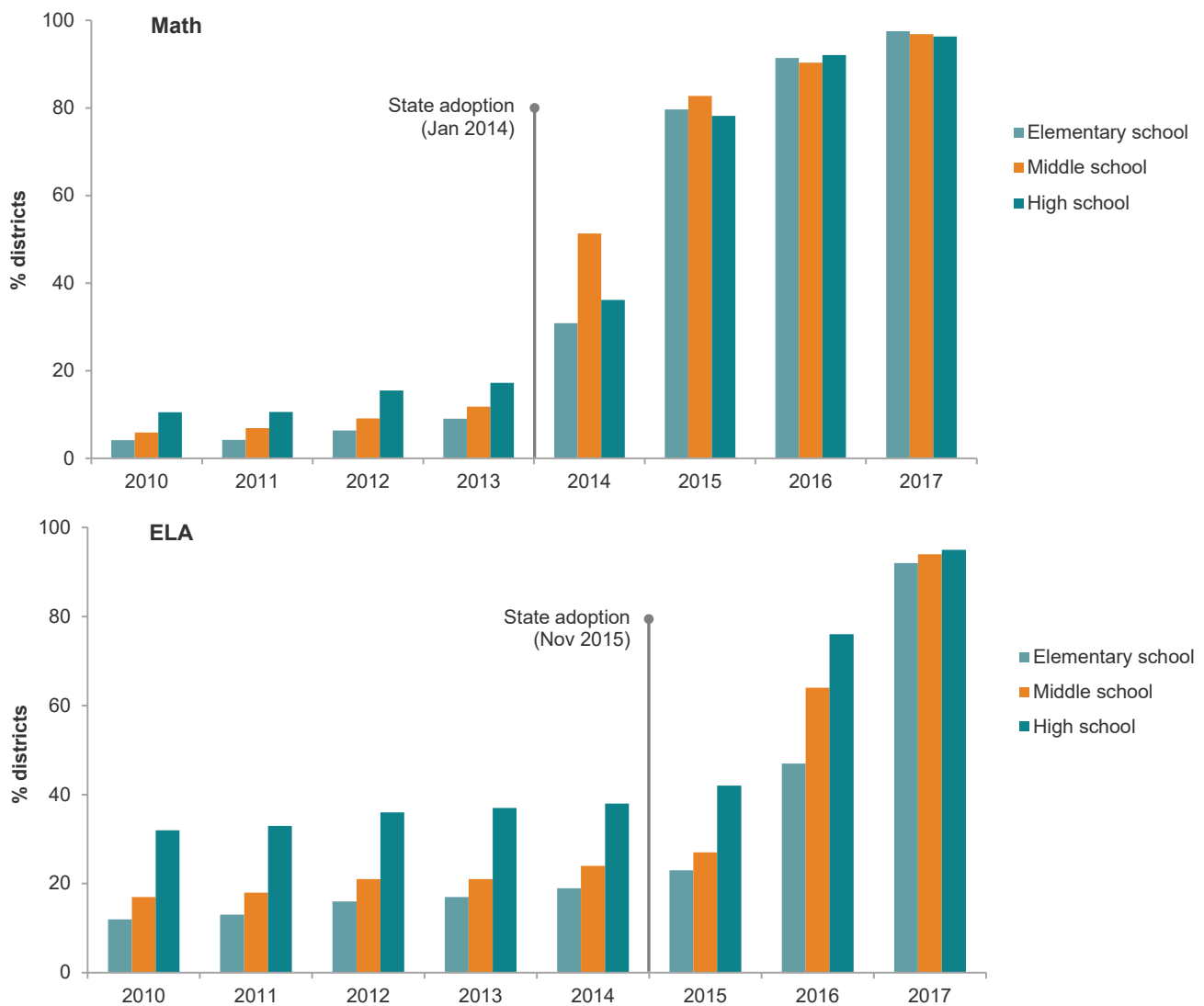
As Figure 4 illustrates, textbook alignment is a more complicated story. The state approved new math instructional materials in January 2014 and new ELA materials in November 2015, which, as shown in Figure 4, led to a large increase in local textbook adoption. Prior to state approval of Common Core textbooks, adoption tended to happen earlier and more quickly in English than in math, perhaps in part due to the technical nature of math. Notably, in 2014–15, close to 60 percent of districts aligned middle school math textbooks with the standards. This is not surprising, as curricular acceleration typically begins in middle school, and then affects students’ math pathways in high school.<sup>7</sup>

<sup>7</sup> The exact policies governing mathematics acceleration vary by district, but these generally begin in middle school for most students, and involve giving the most academically prepared students opportunities to reach higher levels of math (such as calculus) earlier.

Only about 40 percent of high schools adopted textbooks in both subjects before the new SBAC testing. Many high schools do not even use textbooks for English. They tend to rely on teacher-developed materials, and therefore do not need to wait for the publishers to develop new English textbooks. This fairly late adoption timeline—coupled with quality issues in some textbooks (Cogan, Burroughs and Schmidt 2015)—suggests that most students did not have access to Common Core materials until only recently.

In any case, as of spring 2019, three-quarters of implementing districts had aligned their math curricula to the new standards, with English slightly lower at 71 percent. There is no significant variation based on district size, geographic location, or high-need students share. It remains to be seen, as time passes, how alignment with the new standards will affect SBAC test scores and other student outcomes.

**FIGURE 4**  
Percentage of schools using textbooks aligned with Common Core, 2010–11 to 2017–18



SOURCE: School Accountability Reports Cards (SARC), California Department of Education, 2017–18.

NOTES: Sample includes 751 school districts serving 75–80 percent of the entire K–12 student population. A few districts reported using Common Core aligned textbooks (judging by the title) before the state adopted the standards in 2010. After several manual checks (against districts’ websites), we believe these are reporting errors, as these districts did not appear to have adopted aligned textbooks by 2017–18. Therefore, we coded these as 0 (not using aligned textbooks). SBAC testing starts in 2014–15.

## Shifts in classroom instruction lag behind

Just as districts will need more time to further align their curricula and textbooks, teachers may also need more time to acquire the content knowledge and pedagogical skills they need, particularly in math. To fully align with Common Core and achieve the desired learning outcomes, teachers have to make several paradigm shifts in classroom instruction.

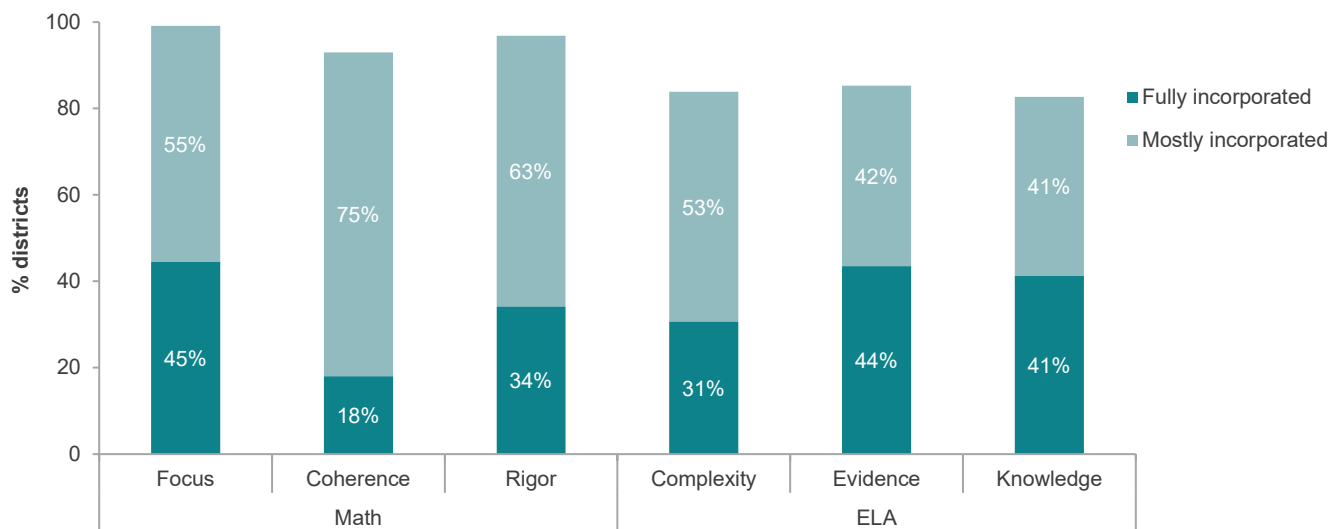
In math, they need to significantly narrow and deepen the way time and energy are spent in the classroom (focus), link topics and mathematical thinking across grades (coherence), and pursue conceptual understanding, procedural skills and fluency, and applications of math knowledge (rigor). In English, the standards call for regular practice with difficult texts and their academic language (complexity), using passages from texts to present careful analyses (evidence), and building expertise through content-rich nonfiction (knowledge) (NGA, CCSSO 2010).

Taken together, Figures 3–5 suggest that many implementing districts are still years away from fully aligning their curricula, textbooks, and instructional practices with Common Core. Most have purchased textbooks, but at the beginning of 2019, most teachers had yet to complete the difficult process of fully aligning their instructional practices (Figure 5).

In math, only 45 percent of implementing districts reported full alignment with the focus requirement. It is considerably lower in other domains—34 percent in rigor and 18 percent in coherence. Less than 10 percent of districts have made the instructional shifts in all three domains. On average, more progress has been made among English teachers than math teachers, which is similar to the national findings (Kaufman et al. 2018).<sup>8</sup>

**FIGURE 5**

More English than math teachers have aligned their instructional practices with Common Core



SOURCE: PPIC Common Core Implementation Survey, 2019.

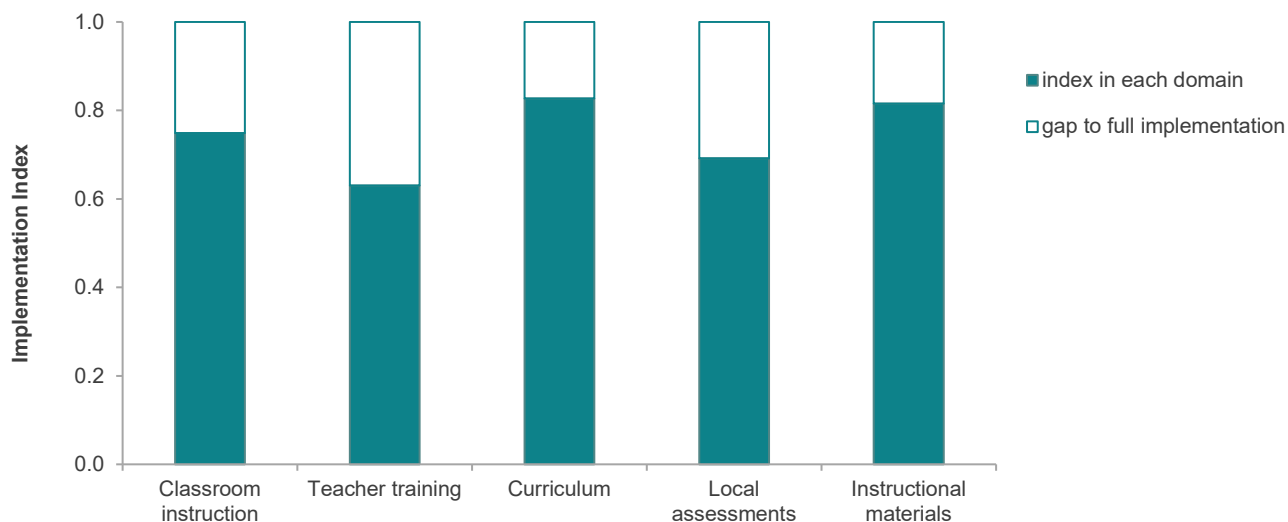
NOTES. Numbers do not add up to 100 percent due to exclusion of other responses (e.g., “somewhat aligned,” “not at all aligned”). Sample restricted to respondents who are familiar or very familiar with implementation. Within each subject area, we observe high correlations between each domain (0.7–0.9). We also found a relatively high correlation across subjects (0.6–0.8). Sample too small for any meaningful breakdown by district characteristics (N=66–109).

<sup>8</sup> Existing studies have detailed a range of challenges that might explain the lack of progress. These include lack of aligned curriculum, time, and funding; difficulties in aligning teacher preparation and development programs; and lack of content-based professional learning opportunities for teachers (Kober and Rentmer 2011; McLaughlin, Glaab, and Carrasco 2014; Polikoff 2014; Wu 2011).

Figure 6 shows our standards implementation index, which is a weighted average of the alignment scores districts received in each of the following areas: curriculum, instructional materials, local assessments and instructional practices.<sup>9</sup> As the figure demonstrates, overall the state has made more progress in instructional materials and curriculum than in classroom instruction and teacher training. In our next section, we will elaborate on how district implementation is affecting student outcomes.

**FIGURE 6**

The state has made more progress in some areas than in others



SOURCE: PPIC Common Core Implementation Survey, 2019.

NOTES: Sample is restricted to districts that were in the implementation phase at the time of survey. About 30 percent of districts were not, and hence are excluded from the calculation. The bars are listed in the order of their importance/weights, e.g., classroom instruction has the largest impact on student outcomes, whereas instructional materials have the smallest.

## Common Core Implementation and Student Outcomes

California has seen considerable progress in its Common Core implementation compared to 2013. Even though there is still a long way to go, many districts have made substantial shifts in instructional and other practices. Since adopting the standards was intended to prepare California’s students to compete in the 21st-century global economy, both policymakers and practitioners need to understand how, whether, and to what degree these efforts are paying off.

To examine how the standards have affected student outcomes we looked at school years 2007–08 to 2017–18, using Common Core textbook adoption for elementary, middle, and high schools as our measure.<sup>10</sup> Granted,

<sup>9</sup> The weights are based on the median effect size of each intervention retrieved from literature reviews. The index ranges from 0 to 1, with 1 indicating full implementation. (Please see [Technical Appendix C](#) for more information). The index (shown in [Technical Appendix C Figure 1](#)) could also be calculated for individual districts, showing the progress local districts have made over time.

<sup>10</sup> These data are publicly available from the California Department of Education. Our outcome measures include the share of students scoring at or above proficiency levels in state standardized assessments, commonly known as SBAC (grades 3–8), a–g completion rate, high school graduation rate, AP participation rate, AP passing rate, and SAT participation rate (grades 9–12). Textbook adoption is included in annual SARC files. As our survey has shown, textbook adoption is highly correlated with other markers of Common Core implementation, including curriculum and local assessments. Since districts purchase textbooks on a regular basis (every six years), they are more likely to be (early) adopters if their current cycle ends/coincides with the state’s adoption timeline. The state’s timeline is largely exogenous, as it

textbook adoption is only one key milestone in a district’s implementation of the new standards. But, as our survey demonstrates, it is a good proxy for local implementation as it is highly correlated with curriculum/course model adoption.<sup>11</sup> Insofar as districts that adopted textbooks aligned with Common Core had not yet fully implemented other aspects, the relationship between textbook adoption and student outcomes will represent only a partial effect of the new standards. Nonetheless, it provides key insights into the efficacy of recent efforts in California.<sup>12</sup>

We compared the relative improvement in student outcomes over time between implementing and non-implementing districts. Overall, in elementary and middle schools we find a number of modest improvements—most notably in English. In high schools, outcomes vary by school type and composition. High-need schools saw a modest increase in their a–g completion rate, but rural high schools experienced a decline.

Given the cumulative nature of student learning, over time these modest effects can become notable improvements. Such incremental changes are typically associated with large-scale educational reform efforts in the last century (Tyack and Cuban 1995). Whether and how these effects accumulate over time will become clearer when we have additional years of post-implementation data.

## Improvements in Elementary and Middle Schools Are Modest

Figure 7 summarizes SBAC testing outcomes in English and math for elementary and middle schools after adopting textbooks aligned with Common Core.<sup>13</sup> In English there is a 1.4 percentage point increase in the share of elementary school students at or above proficiency and a 1 percentage point increase in the share of middle school students at or above proficiency.<sup>14</sup> The average proficiency rate is 44 percent for elementary schools and 46 percent for middle schools, so this amounts to a 2–3 percent increase. Math results are smaller in middle school (0.6 percentage points, or about 2%) and not significant in elementary.

These differences across subjects could be attributed to other aspects of local implementation. For example, alignment in teacher instruction, curriculum, and local assessments is higher overall in English (Table 2, Figure 5). And the technical nature of math—plus a lack of content-based professional learning opportunities for math teachers—could account for slower improvement in that subject area (Wu 2011).

To explore whether the effects differ by grade level, we repeated the same analysis for each SBAC-tested grade (grades 3–8).<sup>15</sup> We found similar results.<sup>16</sup> With the exception of grades 7 and 8, proficiency in English saw a 1–1.7 percentage point increase. Again, most of the estimates are small and not statistically significant for math, with the exception of a 1 percentage point increase in grades 4 and 8 ([Technical Appendix B, Table 1](#)).

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was delayed due to legislative reasons. Since charter schools are not subject to the textbook requirements, we exclude them from the analysis. Detailed information about our data sources, sample, and methods are included in [Technical Appendices A and B](#).

<sup>11</sup> The correlation is around 0.8.

<sup>12</sup> To address the concerns that well-resourced districts may be more likely to be (early) adopters, we leverage the variation in the timing of adoption both across and within districts, and use a difference-in-difference method.

<sup>13</sup> Estimated effects are also similar using scale scores (normalizing to the state mean and standard deviation) instead of percent proficient, indicating that changes only near the margin of proficiency are not solely responsible for the documented effects. Please refer to [Technical Appendix B](#) for detailed results and discussion.

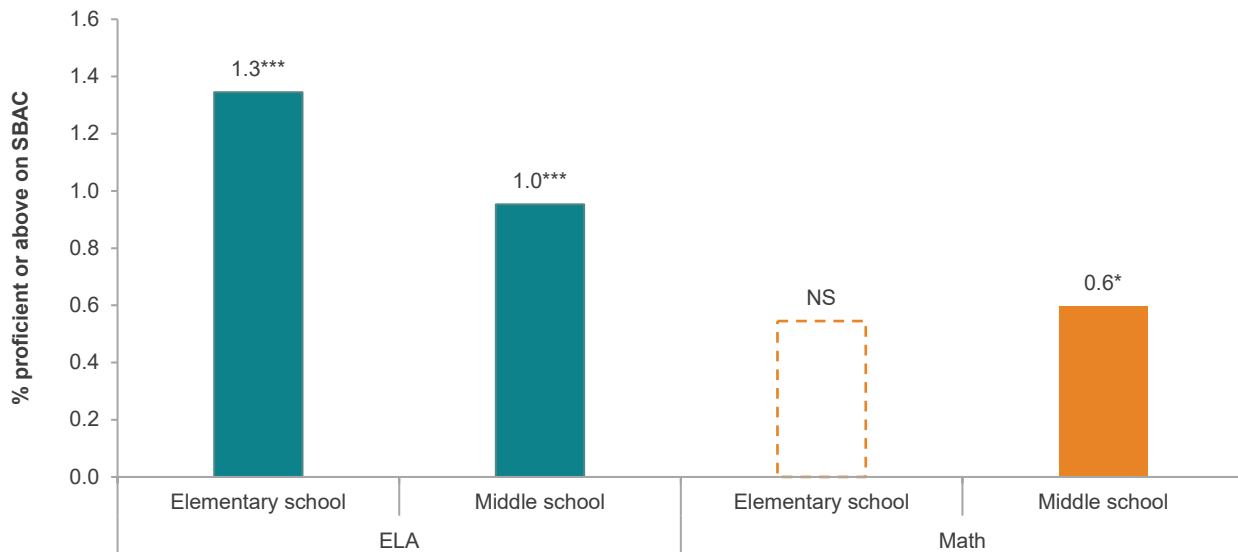
<sup>14</sup> Effects come from difference-in-differences models that account for fixed differences between schools (e.g., funding from the state’s new school funding formula, which is entirely based on student and subgroup enrollment), and control for time-varying demographic characteristics of schools. See [Technical Appendix B](#) for further detail.

<sup>15</sup> Compared to the previous standards, Common Core made some trade-offs and reorganized the order in which some standards are taught. For instance, it includes more addition and subtraction in K–3, and moves up some geometry standards to 8th grade.

<sup>16</sup> Results are also similar using scale scores instead of proficiency rates. See [Technical Appendix B](#).

**FIGURE 7**

Adoption of Common Core instructional materials has led to small improvements in English and middle school math



SOURCE: California Department of Education (2014–15 to 2017–18).

NOTES: NS: not significant at any conventional level. The numbers are the coefficients of standards adoption estimated using equation (2) in [Technical Appendix B](#). The dependent variables are % students at or above proficient on SBAC (grades 3–8). The average proficiency rate is 44 percent for elementary schools and 46 percent for middle schools. The results are robust to the inclusion of one-year lag and other alternative specifications ([Technical Appendix B](#)).

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Why High School Results Are Not Yet Conclusive

It is more complicated to assess how Common Core standards are affecting high school students, because outcomes go far beyond SBAC scores. Often referred to as College- and Career-Ready (CCR) standards, their intention is to prepare students for postsecondary success in college and the workforce. There is a very high level of alignment between Common Core and both AP and SAT exams; the College Board has been a strong and active advocate for Common Core. In fact, AP standards were an important resource in development, ensuring that students following Common Core curriculum will be well prepared for AP and/or SAT testing (Hart et al. 2011). Moreover, the University of California requires that a–g course content include the new standards (UCOP 2015).

Another complication with respect to discerning outcomes at the high school level has to do with how the math standards are organized. In grades K–8 they go by grade level. In high school that changes to conceptual category (e.g., number, algebra, geometry, and probability and statistics). And there are two distinct curricular pathways districts can choose from:<sup>17</sup>

- **A traditional pathway** that typically consists of three courses: algebra 1, geometry, and algebra 2.
- **An integrated pathway** (typically seen internationally) that consists of a sequence of three courses (e.g., integrated math 1, integrated math 2, and integrated math 3), each of which includes number, algebra, geometry, and probability and statistics.

<sup>16</sup> Districts may also choose a compacted pathway, which allows students to reach advanced coursework such as Calculus earlier.



Statewide during the 2017–18 school year, 54 percent of districts followed the traditional pathway and 46 percent the integrated. There was no significant difference in student outcomes between either model, although the integrated model is much more popular among high-need districts (71%). Neither the state nor the NGA endorsed either model, so the difference in preference could reflect districts’ pedagogical philosophy, resource constraints, and/or student needs (Harlow 2015).

In any case, when we examine math pathways, we find that most Common Core outcomes are not significant except for AP enrollment, where the positive effects seem to be concentrated among high schools using the traditional pathways ([Technical Appendix B, Table 6](#)). In addition, we find no relationship between standards adoption (in either subject) and a–g completion rate, high school graduation rate, AP participation rate, AP passing rate, or SAT participation rate ([Technical Appendix B, Table 3](#)).

There are several possible reasons for these null findings in high schools in contrast to small improvements in elementary and middle schools. For one thing, our measure—textbook adoption—is likely a less-reliable indicator of true shifts in instructional practices at the high school level. The state does not approve textbooks for high schools, districts do. This may lead to more variation in the quality of textbooks, and less alignment between textbooks and curriculum shifts. Moreover, many high schools do not use any textbooks at all, particularly in English. Some rely on their teachers to develop their own instructional materials, with varying quality.

Finally, timing makes a difference. Common Core implementation happened very late in high schools compared to elementary and middle schools. This left us with fewer years from which to evaluate changes in outcomes. Because of the more varied and complex dynamics of high school curriculum, a more comprehensive evaluation of high school effects will likely require additional years of data.

## Variation by Student and School Characteristics

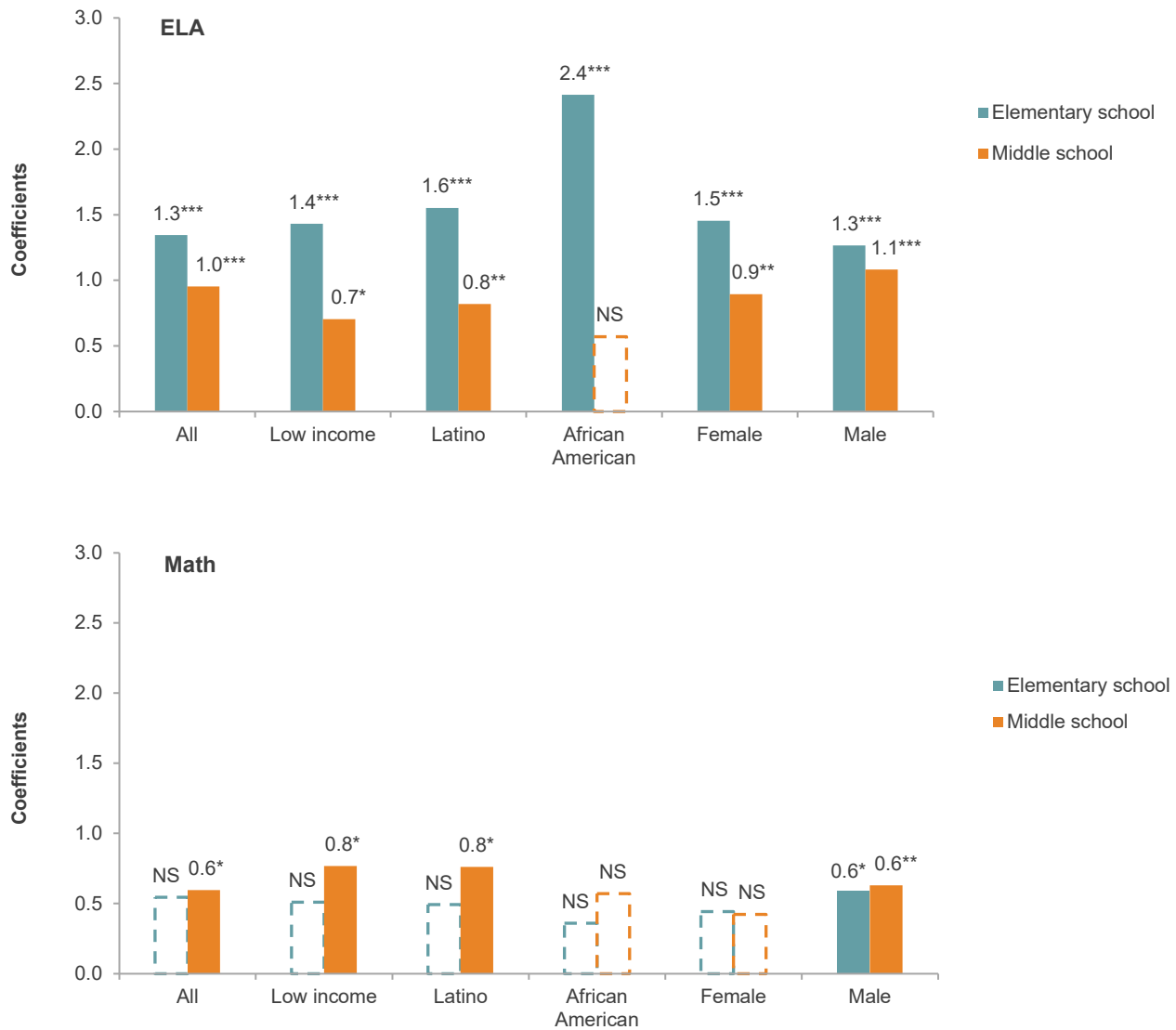
California adopted Common Core in order to promote equity in the quality of education and to narrow the state’s persistent achievement gaps. The assumption was that exposing all students—including those in low-income, rural, or small schools—to the same rigorous standards would help to achieve that end. So it is particularly important to examine how disadvantaged students and schools fare under the standards.

In this section we use the measure of textbook adoption to explore outcome variations in student subgroups (e.g., minority students, low-income students, and special education students), and school characteristics (e.g., small schools, high-need schools, rural schools, and under-staffed schools).

### Low-income and Latino students have slightly bigger gains in elementary and middle schools

In English we find modest improvements for most student subgroups. These range from 1.3 to 2.4 percentage points in elementary schools and 0.7 to 1.1 percentage points in middle schools (Figure 8, panel A). The effects are slightly larger among low-income and Latino students. In elementary school math, the point estimates are not significant, with the exception of male students (0.6 percentage points). In middle school math, we find small improvements among most student groups, with the effects being larger among low-income and Latino students.

**FIGURE 8**  
Common Core effects in English and math across student subgroups



SOURCE: California Department of Education, 2014–15 to 2017–18.

NOTES: Bars with dotted outlines are not significant (NS). The numbers are the coefficients of Common Core adoption estimated using equation (2) in [Technical Appendix B](#). The dependent variables are % students at or above proficient on SBAC (grades 3–8). Average proficiency rates in English: low-income students (34% for elementary grades, 37% for middle school grades), Latino (36%, 38%), African American (24%, 30%), female (49%, 52%), male (40%, 40%). Average proficiency rates in math: low-income students (29%, 25%), Latino (29%, 25%), African American (18%, 17%), female (37%, 35%), male (40%, 30%). The results are robust to the inclusion of lags, as well as other falsification tests ([Technical Appendix B](#)). Most of the differences in coefficients are significant.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

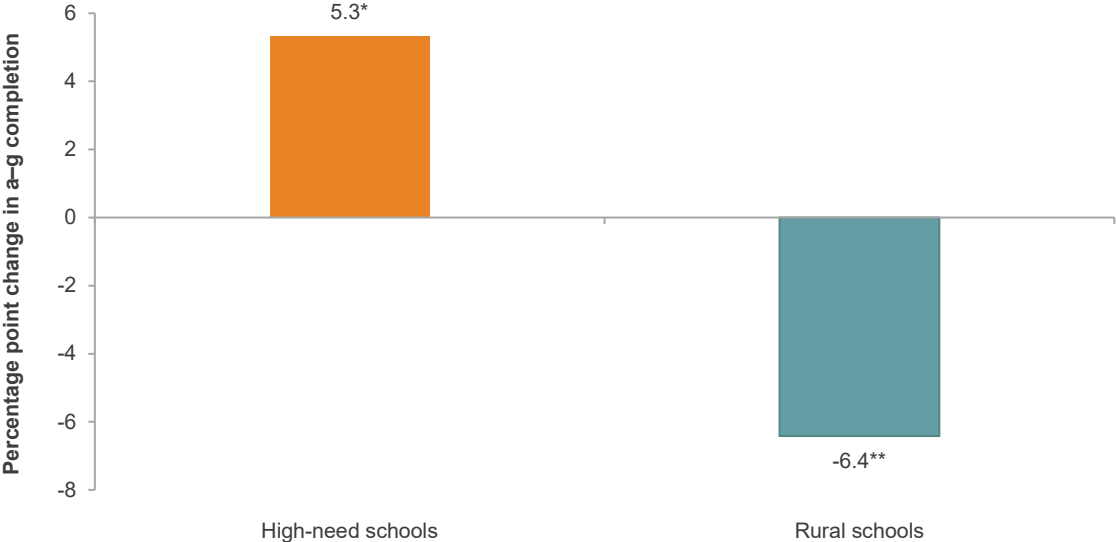
## High school outcomes vary by school characteristics

Since subgroup outcome data at the high school level are not available, we looked at schools' high-need status, average teacher quality (using the share of novice teachers as a proxy), and geographical location. As with the analyses we outlined in prior sections, we used textbook adoption as our measure.

As Figure 9 illustrates, high-need schools experienced greater gains than average—a 5.3 percentage point (22 percent) increase in a–g completion. This could be explained by increased alignment of local graduation policies to the a–g requirements, as a greater share of high-need districts require a–g completion for high school graduation (Gao et al. 2018). However, we do not find any variation in schools with large shares of novice teachers (e.g., those in the top quartile).<sup>18</sup>

In contrast, rural schools experienced a decline of 6.4 percentage points, or 25 percent. There are several possible reasons for this. First, as our survey has shown, rural high schools are less likely to implement Common Core beyond textbook adoption. Second, it is often more difficult for teachers in remote locations to access high quality professional development. This creates a particular challenge, as UC requires a–g courses to be aligned with the standards (UCOP 2015).

**FIGURE 9**  
Common Core effects on a–g completion rate, by school characteristics



SOURCE: Authors’ calculation.  
 NOTES: The numbers are the coefficients of Common Core adoption estimated using equation (1) in [Technical Appendix B](#).  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. There is no significant variation by school size.

In summary, we find some evidence suggesting that disadvantaged students and schools are experiencing more/bigger gains after standards-aligned textbook adoption than before. Given the cumulative nature of student learning, these gains may have important implications for the achievement gaps in time. However, rural schools are not yet thriving in the new paradigm; this will need to be explored in more detail to determine what help is needed.

<sup>18</sup> The point estimate (-1.4) is negative, but not significant, which may in part be due to sample limitations—school-level teacher data are not available before 2012–13, which reduces our sample by nearly half.

## Conclusion

In 2010, California adopted the Common Core State Standards to improve student learning. Over the past nine years, districts have made significant progress implementing them. In 2019, the majority of respondent districts reported having aligned their curricula/course models, instructional materials, and local assessments with the standards. However, 30 percent have not yet begun, particularly in rural high schools. In implementing districts, classroom instruction—the single most important factor determining successful outcomes—lags behind, as most teachers have not fully adjusted their instructional practices. Additionally, most of the key steps in the alignment process did not happen until or after the first year of SBAC testing (2014–15).

Overall, we find modest incremental improvements in student outcomes after districts adopted CCSS-aligned textbooks. In elementary and middle schools, the share of students meeting standards increased by 1–1.4 percentage points in English. All major student groups have experienced similar gains, with the effects being slightly larger among Latino and low-income students. The gains are smaller in middle school math (0.6 percentage points) and insignificant in elementary school math.

Although these gains are small, it is important to remember that we are measuring the impact of only one of many steps in the process of implementing standards. The full effects of instructional implementation will likely require additional years of data to fully parse out. In addition, incremental improvements can accumulate over time.

For high schools, high-need schools experienced a modest gain in a–g completion but rural schools saw a decline. We do not find any significant variation based on teacher staffing or school size.

Local implementation is difficult; yet it has the potential to make or break an educational policy (Spillane, Reiser, and Reimer 2002). The modest positive effects of Common Core are encouraging, as they are a testament to the progress districts have made in local implementation. At the same time, they highlight the need for continuing improvements over time to reach full potential, particularly in math. In order for the state to accomplish that, we recommend the following:

**Provide targeted support and technical assistance to late or non-implementers.** Nearly 30 percent of districts were still in the awareness or transition phase in spring 2019, and our conversations with sample districts suggest that resources and capacities remain a big barrier. Additional supports should also target rural schools, which tend to have fewer resources and face additional challenges. The state could accomplish this by leveraging its network, e.g., County Offices of Education.

**Provide more guidelines about quality professional development, particularly for math.** There is a large variation in the quality of training for teachers and educators, and most of what is available lacks the rigor and/or content knowledge Common Core requires (Wu 2011). What constitutes effective professional development and how can districts better equip teachers with the needed content knowledge and pedagogical skills? These questions need to be addressed as the state prepares to update its math curriculum framework in 2021.

**Promote longer-term and more targeted research.** Future research should go beyond test scores and look at Common Core’s long-term effects on college and career outcomes, including college admission, enrollment, persistence, and completion. Future research should also unpack the challenges faced by rural schools in particular.

**Take a more active role in monitoring and supporting district implementation of standards in other subject areas.** One option is to create a standardized reporting tool for the Priority 2 dashboard indicator on standards. This would help alleviate current difficulties in comparing data across districts and time, and it could also put

more pressure on districts to implement the standards. Adding an implementation index to the dashboard indicator on standards would represent another step in the right direction, as it would allow policymakers and local stakeholders to more fully understand the various steps districts have taken toward full implementation.

As the state moves forward with the Common Core and other standards—in areas ranging from science to English language development—systems to track and support continued local implementation could go a long way toward alleviating some of the growing pains associated with these shifts and improving the overall efficacy of the new standards.

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