# GETTING DOWN — TO FACTS II —

# Using Data for Improvement: Learning from the CORE Data Collaborative

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## Introduction

Signed into law in 2013, the Local Control Funding Formula (LCFF) ushered in a new system of accountability and support that encourages a deeper and more meaningful approach to the work of educational improvement in California. Specifically, LCFF gives school districts more flexibility in how they invest resources to meet locally defined goals. Under this new system, districts are required to detail their plans for improving student outcomes and how dollars will be spent, with particular attention to performance problems highlighted on the state's School Dashboard,[1] which emphasizes the achievement of vulnerable student populations.

Under emerging policy structures in California, the responsibility for school improvement is increasingly placed upon local school districts, with County Offices of Education (COEs) playing a critical support role. In this system, districts are responsible for school improvement, with counties in charge of ensuring quality across districts and providing feedback and support where necessary. Underlying this major policy shift is the idea that local leaders are in the best position to drive real educational improvement and ensure quality across multiple schools and contexts.

Through such bodies as the State Superintendent's Accountability and Continuous Improvement Task Force,[2] policymakers have signaled that "continuous improvement" is the recommended path to achieving better outcomes for California's students. While a continuous improvement approach involves many changes to the way educational systems work, strategic data use is central to effective implementation (Hough, Willis, et al., 2017; Grunow, Hough, Park, Willis, & Krausen, 2018). Although there is wide agreement that data are critical to the state's policy vision, many questions remain: What does it look like to use data for improvement in California's context? What data are needed, by whom, and for what purpose, at various levels of the education system? And what can we learn from innovative practice in our state?

As California supports districts and counties statewide to embark on this improvement journey, there are important lessons to be learned from the CORE districts, six of which developed an innovative accountability system under a waiver from No Child Left Behind (NCLB). The CORE districts are early adopters of the new accountability paradigm: local leaders using multiple measures of school performance and working together to figure out collectively what works best for struggling schools. Now deepening their work together as a Networked Improvement Community (NIC),[3] the CORE districts have simultaneously expanded access to their multiple-measures data and learning system by inviting other California districts to join their "Data Collaborative." Districts who join contribute their own student data to the CORE measurement system and are then able to benchmark student performance against other

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[1] For more detail on the California School Dashboard, see: https://www.caschooldashboard.org/#/Home.

[2] The Task Force report can be found at https://www.cde.ca.gov/ta/ac/ar/documents/account-report-2016.pdf.

[3] See Bryk, Gomez, Grunow, and LeMahieu (2015) for more information about NICs.

schools in the state. Data Collaborative districts engage in structured network learning activities that enhance their capacity to use data to drive system improvements. Currently, over 50 California school districts representing nearly a million students have joined the Data Collaborative. With the one million students already served by the original CORE districts, the combined data system now represents nearly a third of California's student population.

In what follows in this report, we first provide a framework for how data use for improvement is different from data use for accountability and how data should be used by actors at different levels of the system. Next, we discuss the policy context in California and the current state of data use based on interviews conducted in the summer of 2017 with 41 leaders from state education agencies, COEs, school districts, technical assistance providers, education advocacy organizations, and education associations. Finally, we share lessons from the CORE Data Collaborative about how data can be used for improvement within networked structures, including what data is needed and how learning and collaboration can be facilitated.

### What Is Data Use for Improvement, and How Should It Be Used?

Though the use of data in the education system is not a novel practice, data use for continuous improvement reflects a recent and critical change in mindset. Data use for improvement entails a cycle of collecting and interpreting data, constructing ideas on potential solutions, making appropriate modifications to improve, and monitoring and researching whether changes resulted in improvement (Abbott, 2008; Easton, 2009; Hamilton et al., 2009; Ikemoto & Marsh, 2007; Mandinach, 2012; Means, Gallagher, & SRI International, 2010). In its basic form, this iterative cycle transforms data into usable knowledge and thus makes it actionable. The term continuous improvement also signifies the collaborative, transparent, and inquiry-driven culture that sets it apart from other approaches, such as accountability. In this section, we review extant literature and provide a framework for how to use data for improvement within the educational context. We will cover three primary topics:

1. Data use for improvement is different from data use for accountability purposes.
2. Data must be embedded in an aligned process for improvement.
3. The kinds of data needed vary by user, by improvement process phase, and by educational system levels.

### Data Use for Continuous Improvement Is Different from Accountability Metrics

A primary focus of data use in the field of education in recent history has been on system-level measures for accountability. For many years under NCLB, educational measurement was limited to standardized assessments of student academic performance, measured annually for accountability purposes. The Every Student Succeeds Act (ESSA), passed in 2015, has introduced a more comprehensive approach to measurement than was required under NCLB, with the intention of including more measures and moving away from adverse consequences of NCLB's measurement system, namely the narrowing of the curriculum towards tested subjects and content, strategic gaming of accountability structures, and

cheating (Figlio & Getzler, 2002; Jacob & Levitt, 2003; Lauen & Gaddis, 2016; Neal & Schanzenbach, 2010). Specifically, ESSA requires states to include multiple measures of student academic achievement, including: academic performance as measured by proficiency on English Language Arts and math tests; academic growth; graduation rate; development of English Learner (EL) proficiency; and at least one additional indicator of "School Quality or Student Success." Acceptable additional indicators include measures of student engagement, educator engagement, student access to and completion of advanced coursework, post-secondary readiness, and school climate and safety. While more measures certainly provide a nuanced view of school or district performance, additional measures alone will not result in continuous improvement (American Association of School Administrators, 2002; Darling-Hammond, Cardichon, & Melnick, 2017; Farrell, 2015; Jimenez & Sargrad, 2017). To this end, it is critical to distinguish how data for accountability is different from data for improvement.

We start here with a framework modified from the healthcare context for how data can be used to advance system change. As Figure 1 illustrates, there are two established pathways through which quality measurement is linked to quality improvement: the "selection" pathway and the "change" pathway. In a "complete improvement strategy," data is used for both selection and change, but these data sources and their use are different (Berwick, James, & Coye, 2003). The first pathway, selection, is what we typically think of as accountability. Data utilized for selection help parents decide where to send their children and guide policymakers in determining whether particular schools are in need of intervention due to low performance (as in the case of identifying the bottom 5 percent of schools under both NCLB and ESSA). Such consumers utilize knowledge about performance to make "selections" about interventions, choice of schools, or policies, but the selection pathway does not use data to understand, make changes to, or improve the underlying system.

The second pathway, however, stresses the importance of using data to signal the improvements needed to those responsible for enacting change in the system. Data for this pathway are employed to evaluate changes, run predictive analytics, and establish priorities (Yeager, Bryk, Muhich, Hausman, & Morales, 2013). Within education, data for improvement can help track whether schools are taking action to meet their goals and enhancing teachers' capacity to adapt their instruction to their particular students (Breiter & Light, 2006; Schildkamp & Kuiper, 2010; Schildkamp & Lai, 2013; Schildkamp, Poortman, Luyten, & Ebbeler, 2017; Wayman, 2006; Wohlstetter, Datnow, & Park, 2008; Young, 2006). Broadly, data for change treat knowledge-seeking as crucial to managing the school system, as opposed to independent of the system, and prioritize an adaptive and continuous design for immediate improvement (Baily, Bottrell, Lynn, & Jennings, 2006). The primary users of this kind of data are the people responsible for running the systems, including school, district, and county leaders. These local leaders utilize data about processes and results to make changes to the educational systems that they are in charge of managing.[4]

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[4] There is yet another important use for education data, which is the use for research, a critical activity for knowledge generation. While investigation for improvement purposes prioritizes an adaptive and continuous

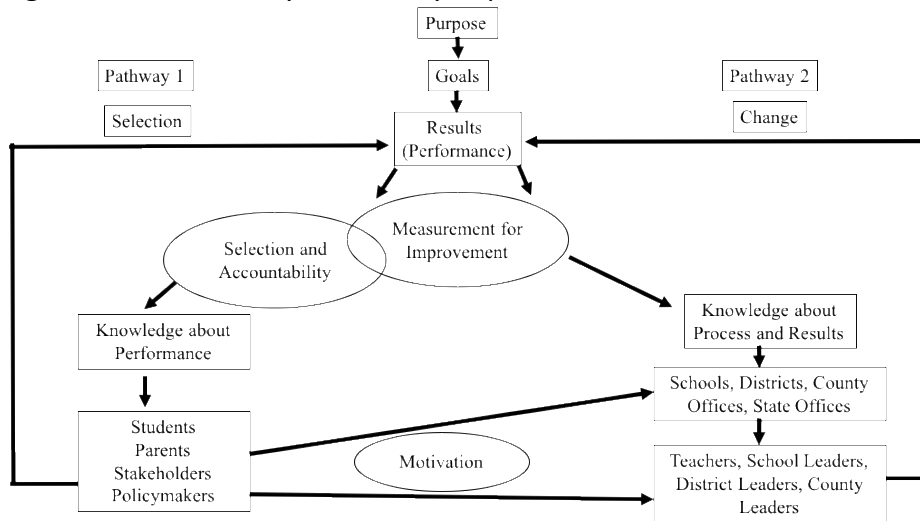**Figure 1.** Two Pathways to Quality Improvement in Education



*Figure 1.* Adapted from "Connections between quality measurement and improvement," by Berwick et al. (2003). *Medical Care*, *41*(1), I–30.

The annual public data provided for accountability might illuminate a problem in performance, but the data in the change pathway help to highlight *why* a problem is occurring and how change can be enacted to make improvements. The types of data needed for improvement are not purely quantitative but rather should encompass what W. Edwards Deming referred to as "profound knowledge," or the "knowledge of systems,… of variation,… of psychology, and… of how knowledge grows" (Lewis, 2015). To this end, data for improvement are collected over time, are intermediary in nature, and are not solely represented by the "use of percentiles… and [measures that yield] nearly all 0s or all 100%" (Yeager, Bryk, Muhich, Hausman, & Morales, 2013; Provost & Murray, 2011). With schools and districts drawing knowledge from a widening range of data that includes input (e.g., student demographic data), process (e.g., classroom observations), context (e.g., building information), and output data (e.g., student achievement), a crucial step moving forward is to determine what types of information would most benefit educators in this quest for continuous improvement (Nelson, Slavit, & Deuel, 2012; Schildkamp et al., 2017).

Before looking into the specifics of data use for improvement in education, however, it is important to realize that the change pathway, unlike selection, relies "on the ability of organizations and providers of care to undertake systematic change" (Berwick et al., 2003). In other words, there is no reason to believe that data will result in improvement if the

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design for immediate improvement, investigation for research purposes broadly aims to "contribute to generalizable knowledge" (Baily et al., 2006). However, many recent research approaches, such as research-practice partnerships (Coburn, Penuel, & Geil, 2013) or improvement research partnerships (Bryk, 2015), specifically aim to leverage research for local improvement. In the ideal state, these research partnerships are designed to support education leaders at the various stages of improvement detailed in Figure 2. The statewide data systems for which Phillips, Reber, and Rothstein (2018) advocate in their work for this project could be useful for both generalizable research and for specific types of improvement work.

measurement system is not developed and used in the context of an aligned improvement process. We turn to this idea next.

**Data Must Be Embedded in an Aligned Improvement Process**

At the core of continuous improvement is the perspective that data do not drive. In other words, a distinguishing feature of data use for improvement is that data do not guarantee use or action; individuals must be active in all steps of data collection and interpretation to make them actionable (Ackoff, 1989; Farrell, 2015; Mandinach, 2012; Marsh, Pane, & Hamilton, 2006). To this end, the optimal way to utilize data for improvement is in the context of an aligned continuous improvement methodology.[5] Various continuous improvement methodologies are currently used in education, each articulating a set of tools, principles, and social practices. These include the Plan-Do-Study-Act Cycle (PDSA), Network Improvement Communities, Design-Based Implementation Research (DBIR), Deliverology, Six Sigma, Lean, Implementation Science, Positive Deviance, and Appreciative Inquiry (Park, Hironaka, Carver, & Nordstrum, 2013). Regardless of the specific methodology selected, experts agree that it is important for an organization to select and use a common method to promote discipline within their continuous improvement efforts. Having a common improvement methodology creates a shared language and enables building expertise with the practical tools of improvement over time. When an organization is aligned around this improvement methodology, the data that are collected can be used in a clear and actionable manner. Across all methodologies, several features of continuous improvement remain constant:

**Cycles of inquiry.** One central feature of continuous improvement is the idea of cycles of action and reflection. This cyclical process allows for a "design-development ethic," which prioritizes constant learning at a low cost by making improvements in increments (Yeager et al., 2013). An interesting example of this kind of cycle in education comes from the College Readiness Indicator Systems (CRIS), which is a new framework for measuring college readiness created by Brown University, Stanford University, and the University of Chicago (Annenberg Institute for School Reform, Brown University, John W. Gardner Center for Youth and Their Communities, Stanford University, & University of Chicago Consortium on Chicago School Research, 2014). The CRIS "cycle of inquiry" consists of identifying, planning, implementing supports, monitoring progress, adjusting supports, and analyzing results. The key to constant learning is for districts and schools to collect frequent data implementing changes in order to effectively monitor progress and adjust supports. Importantly, the people who are tracking the data in these cycles should also be responsible for making good use of it.

**Norms, culture, and mindset.** To make good use of data, educators and administrators must act as the agents of change in an improvement process. Frontline participants in an organization should exercise actively the practice of reflection, discourse, and action followed by the consistent review and monitoring of progress (Adelman, 1993). To this end, a critical feature of continuous improvement is the establishment of norms and culture surrounding data

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[5] For more on improvement methodologies in education, see Hough, Willis, et al. (2017).

use that encourage action from individuals and teams. In the context of education, scholars define data culture as an environment within schools and districts that "includes attitudes, values, goals, norms of behavior and practices" along with a shared vision for data use among teachers and leaders (Mandinach, 2012). Additionally, effective data use for improvement requires buy-in, as educators are more likely to employ data to inform their decision-making if they believe in the use of data and the importance of the specific data elements being tracked (Mingchu, 2008; Schildkamp et al., 2017). This necessitates a mindset that data help to illuminate and solve problems, rather than to scapegoat or punish. Agents of change must perceive data use as a path to "improve" rather than "prove;" an improving stance entails using information as a means to better understand their students and systems and to make changes to their practices accordingly (Nelson et al., 2012). A proving stance towards data use, on the other hand, views information as an end rather than a means, and is demonstrated when educators use data to show how well students are performing rather than to highlight areas of improvement or rethink practices based on data results.

**Organizational capacity.** A supportive data culture involves both collaborative inquiry among teachers, fostered by school and district leaders, as well as an organizational structure and methodology that promotes data use for improvement (Datnow, Park, & Wohlstetter, 2007; Hough et al., 2017; Grunow et al., 2018; Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006; Sharkey & Murnane, 2006; Wayman, Cho, & Johnston, 2007; Wayman & Stringfield, 2006; Wohlstetter, Datnow, & Park, 2008; Young, 2006). The capacity to make collaborative inquiries and create change out of information ultimately "depends on the cognition of the individuals operating within [schools] (e.g., teachers and administrators)" (Moss & Piety, 2007). Agents of change must have the skills to understand, interpret, analyze, and utilize data to recognize their school and student needs and adjust their practices accordingly (Mandinach, 2012; Marsh, Pane, & Hamilton, 2006; Means, Gallagher, & SRI International, 2010; Schildkamp, Poortman, Luyten, & Ebbeler, 2017; Sharkey & Murnane, 2006; Supovitz & Klein, 2003; Wohlstetter, Datnow, & Park, 2008; Young, 2006). Certain routines, such as professional learning communities in which educators work with and learn regularly from each other, can help support capacity-building around effective data use for improvement (Datnow, Park & Wohlstetter, 2007). Equipping "frontline workers" with a broader set of tools and measures for recognizing "the signals for improvement initiatives" can also support educators in building capacity (Martin, Nelson, Rakover, & Chase, 2016). Providing these tools and a structure for their use at the school or district level can help support and advance organizations' use of data for improvement.

## Specific Data Needed Vary by User and Phase of the Improvement Process

While an aligned improvement process with cycles of inquiry, an appropriate culture and mindset, and organizational capacity opens the door for effective data use for continuous improvement, the specific types of data necessary to make changes and improvements ultimately depend on who is using the data and on the phase of the improvement process. In order to determine what data use for improvement looks like in our education system in California, it is helpful to first draw from a broader structure for improvement (Provost &

Murray, 2011). Figure 2 illustrates a typical improvement process with five basic phases, starting with the project definition phase and ending with the phase where system managers are sustaining and monitoring improvements that have been made (The Victorian Quality Council, 2008). The data needed at each of these phases are quite different. In the project definition phase, data needs are geared toward understanding the problem. During the diagnostic phase, managers evaluate existing processes within that area of interest to diagnose potential quality problems and opportunities for improvement. These activities are often geared towards helping leaders "see the system," or better understand the systemic causes of poor performance (Nayfack, Park, Hough, & Willis, 2017). During the intervention phase, individuals use data within iterative PDSA cycles for implementation and progress monitoring. At the impact measurement phase, data help evaluate the effect of interventions on predetermined performance measures. And finally, in the sustainability phase, data are used for monitoring and refining interventions as well as providing feedback in order to sustain the improvements. While some of the information that these phases require is readily available, much of the quantitative and qualitative data need to be collected throughout the process, often with much greater frequency than typical data collection and reporting timelines.

**Figure 2.** Overview of Improvement Process



*Figure 2.* Adapted from The Victorian Quality Council (2008). P = Plan, D = Do, S = Study, A = Act

Within education, the data used in this improvement process will vary by level of the educational system and the actors within each level. These system levels consist of classrooms, schools, districts, as well as counties and state-level actors. The data used for improvement at

each of these levels are different, based on the kinds of information that individuals need in order to make changes in their sphere of influence. An example of these different kinds of data can be found in Figure 3, which provides sample indicators for measuring college readiness at each system level (derived from the CRIS). While classroom-level indicators track individual student-level data that assist educators in recognizing the students in need of additional support, school- and system-level indicators are utilized to evaluate whether the right environment is provided for promoting college readiness (Annenberg Institute for School Reform et al., 2014). Specifically, school-level indicators trace school supports available to students, and system-level indicators assess the use of district and broader system resources to further college preparedness. In what follows here, we dig deeper into data use at each of these levels as well as the alignment among them.

**Figure 3.** Sample Menu of CRIS Indicators and Supports

| | CLASSROOM-LEVEL INDICATORS | SCHOOL-LEVEL INDICATORS | SYSTEM-LEVEL INDICATORS |
|---|---|---|---|
| ACADEMIC PREPAREDNESS | □ GPA and credits/courses □ Benchmark exams | □ Advanced Placement course availability □ Academic supports □ Consistent grading standards | □ Student/teacher assignment policies □ Number of schools with Advanced Placement courses □ Availability/evaluation of academic supports |
| ACADEMIC TENACITY | □ No/low disciplinary infractions □ Attendance □ Self-discipline □ Mastery goal orientation | □ Students' perceptions (instructional scaffolding, academic press, support for autonomy) □ Professional development on practices that promote academic tenacity | □ Communicated expectations about academic tenacity □ Professional development on practices that promote academic tenacity |
| COLLEGE KNOWLEDGE | □ Completion of college and financial aid applications □ Campus visits □ Meetings with college advisor | □ College-going culture in school □ Access to counseling resources □ Resources for teachers' college knowledge | □ Resources to support college-going culture/knowledge □ Communicated expectations about college knowledge supports |

*Figure 3.* Adapted from Annenberg Institute for School Reform et al. (2014).

**Classroom level.** Individual- or student-level data indicators focus on tracking students' individual progress and learning to guide teacher practice (Provost & Murray, 2011). Data at this level, according to the Teaching for Robust Understanding Framework, should allow teachers to help their students across five primary dimensions: content, cognitive demand, equitable access to content, agency, authority, and identity, as well as formative assessment (Schoenfeld, 2015; Schoenfeld & The Teaching for Robust Understanding Project, 2016). Given these dimensions, student-level data would ideally include disaggregated student data to track variation by student, attendance records, and grades as well as portfolios for each student to target interventions. For instance, a data support tool used in New York City Department of Education schools in 2001 supplied disaggregated data reports in the beginning of the school year as well as access to an online information system with individual student data available to educators (Breiter & Light, 2006). The reports, which were connected to teaching resources with strategies and activities for standards-based learning, assisted teachers in using the provided data points to target their instruction, cater to diverse learners, and facilitate conversations about individual students with other teachers and parents.

**School level.** At the school level, data indicators assess the quality and allocation of current resources and supports for students (Wohlstetter et al., 2008). This data can help a school leadership team track progress over time and look for variation between classrooms or

grades to determine how to allocate resources and supports. Examples of school-level data would be: longitudinal student data by classroom, grade, measure, and subgroup; information about special programs; and professional development opportunities. Prince George's County Public Schools in Maryland provide an example of a powerful use of school-level data through their early warning system (Parton, 2015). The district created the early warning system through analyzing previous student data to predict what were effective indicators of academic success in ninth grade. Schools within the district established their own plans for change based on grade-level meetings in which teachers reviewed comprehensive student data. Through these plans for action that were updated quarterly, schools in Prince George's County Public Schools aimed to identify and allocate academic support to the subgroup of students in danger of not graduating on time.

**System level.** At the system level, referring to the district and beyond, data are used to look at patterns in opportunity allocations and to inform funding infrastructure and policy (Annenberg Institute for School Reform et al., 2014). Data indicators for districts, for example, would include administrative data and longitudinal student data by grade, subgroup, measure, and building that would illuminate variations by school and identify "bright spots" in performance or policy implementation. District leaders can use this data to make decisions about which schools need support and on what dimensions in order to ensure quality district-wide.

> **A County-Level "Bright Spot"**
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> A groundbreaking data-sharing initiative called the Silicon Valley Regional Data Trust provides an opportunity for districts within Santa Clara, Santa Cruz, and San Mateo counties to share real-time information about their students amongst themselves and among health and human service county agencies. The shared data warehouse, which the Santa Clara County Office of Education houses, allows districts, schools, and teachers to view various metrics from multiple real-time databases, such as student information systems and state and locally determined assessments. While the warehouse supplies the counties with a comprehensive and comparative picture of the system levels within it, teachers, schools, districts, and even partner agencies can also pull from the "dashboards" the aggregated or disaggregated data indicators that they need to make changes at their respective system levels.
> (McNulty, 2017)

Counties play a similar role, but would attend to variation across all of the districts supported by the COE. Finally, this kind of system-level data can help the state identify and solve large-scale policy issues, such as teacher recruitment and retention or school funding.

**Integration across levels.** While specific data indicators will vary across the classroom, school, and system levels to meet the needs of various users, alignment across the levels is critical (Coburn & Talbert, 2006; Farrell, 2015; Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006; Schoenfeld, 2015; Supovitz, 2006; Wayman, Jimerson, & Cho, 2012). These system levels should not operate within silos; rather, a "strong bottom-up information flow from school-level participants" is essential to informing improvement system-wide (Wohlstetter et al., 2008). Data from the classroom and school levels should thus ultimately flow to the district, county, and state levels on the "data highway" (Mandinach, 2012). This alignment in data sources is supported by alignment in improvement priorities. For example, teachers' efforts in the classroom should be supported by the improvement work at the district level, with each actor

understanding how the data they are tracking is related to a broader improvement strategy. This clear communication will allow for better alignment of efforts from the ground up and from the top down. In this way, classroom- and school-level improvement work should illuminate system-level barriers that must be addressed by the district, county, or state. Similarly, district-, county-, or state-level goals should focus improvement efforts or approaches at the school sites and within classrooms. This alignment can be driven by system-level actors acting as the central hubs of data (Moore, Bracco, & Nodine, 2017), although more study is needed on the best way for these systems to be developed, maintained, and used at different levels (Mandinach, 2012; Marsh & Farrell, 2015; Means et al., 2010; Reeves & Burt, 2006). In light of this framework, we now turn to a discussion of the statewide context around data in this new policy era and the extent to which California's current structures support data use for improvement.

## California Policy Context

In California, recent policy shifts have created a high degree of local control with the expectation that school districts will think differently about school and district improvement. Specifically, several new state policy structures—LCFF, the California School Dashboard, and the Local Control Accountability Plan (LCAP) process—have given school districts more autonomy in how they allocate resources, how to evaluate student and school performance, and how they choose to intervene when groups of students are not achieving (Humphrey & Koppich, 2014). Under these new approaches, district leaders create goals in each of the state's eight priority areas, and then allocate resources strategically to ensure equitable outcomes for all students.[6] Central to this new accountability system is a commitment to supporting and cultivating a system-wide culture of "continuous improvement."

Although K–12 education stakeholders in California have become familiar with terms such as "continuous improvement" over the past several decades, these words exist in a different context under the state's new policy structures. While not specifically outlined or defined in the LCFF statute, bodies such as the State Superintendent's Accountability and Continuous Improvement Task Force and the State Board of Education have issued reports, memoranda, and statements of model practice signaling that continuous improvement is the recommended path to achieving better outcomes for California's students. The State Superintendent's Task Force on Accountability and Continuous Improvement's report (California Department of Education, 2016) explains the state's vision for continuous improvement:

> We are equally committed to supporting and cultivating a system-wide culture of
> continuous improvement… that relies on multiple measures to provide the information

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[6] California's eight priority areas are (a) basic services, (b) implementation of state standards, (c) course access, (d) student achievement, (e) other student outcomes, (f) student engagement, (g) parent involvement, and (h) school climate. For more information on California's eight priority areas, see https://www.cde.ca.gov/Fg/aa/lc/statepriorityresources.asp.

necessary to engage in improvement efforts. This culture of continuous improvement must infuse all parts of the system, including continuous improvement for the system itself, through evaluative mechanisms that allow us to learn from local experience and revisit the indicators, tools, and systems of support we use to ensure they are working as intended.

The ability of districts and COEs to engage in continuous improvement hinges on their capacity to use data for improvement and to enact change at the district office and in schools across the system. The state's California School Dashboard, launched in March 2017, offers a publicly available, online set of data incorporating a range of state and local measures aligned to support and inform school improvement efforts.[7] Districts are required to use data from the state's School Dashboard to inform the development of their LCAP.

The California School Dashboard broadens the concept of accountability from a single metric—standardized test scores—to one with multiple indicators. The indicators include six state measures (academic, English learner progress, chronic absenteeism, graduation rate, suspension rate, college/career readiness) and four local measures (basic services, implementation of state academic standards, parent engagement, and school climate). COEs have two additional local indicators: coordination of services for expelled youth and coordination of services for foster youth.

The five performance levels of the state's School Dashboard are color-coded—red, orange, yellow, green, blue—with red signifying the lowest performance level and blue the highest. In contrast to the state's previous measure of academic performance, the Academic Performance Index (API), which assigned a single number between 200 and 1,000, performance levels on the School Dashboard are calculated based on how current performance compares to past performance and whether those results have declined or improved. The state goal is to reach green on all state indicators, and a performance level below green indicates a need for improvement. By design, the School Dashboard does not provide statewide averages for any of the indicators or an overall ranking of a school or district. The School Dashboard's home page emphasizes the state's priority of addressing achievement gaps with an "Equity Report" that highlights a school's or district's low-performing students from among a dozen subgroups. The goal is that this data will encourage improvement at various levels of the system, which includes meaningful stakeholder engagement.[8]

The data contained in the California School Dashboard is derived from the state's student data system, the California Longitudinal Pupil Achievement Data System (CALPADS). In 2012, after nearly a decade of work, the California Department of Education (CDE) completed this K–12 student database, which includes individual student data on school attendance, special program participation (e.g., English Learner and special education programs), course

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[7] To learn more about the Dashboard's model of accountability, see https://www.cde.ca.gov/ta/ac/cm/.

[8] For more detail on California's accountability system and the California School Dashboard, see Polikoff, Korn, and McFall (2018).

enrollments, and state test scores. Each school district in the state is expected to report these data to CDE, which compiles them in a statewide data system following students across time (Warren & Hough, 2013; Phillips et al., 2018). In addition to the California School Dashboard, these data can be accessed through pulling reports from the Education Data Partnership[9] and DataQuest.[10] Additionally, local test coordinators can access student assessment data from the California Assessment of Student Performance and Progress (CAASPP) portal.[11]

**The State of Data Use in California**

To evaluate the extent to which California's school districts are engaging in continuous improvement using these new policy and support structures, we interviewed 41 leaders from state education agencies, COEs, school districts, technical assistance providers, education advocacy organizations, and education associations.[12] Our aim in these interviews was to understand how various actors define continuous improvement, to what extent they are engaged in it, and how state structures, especially the School Dashboard, are helping or hindering these efforts. We analyzed each case (i.e., agency, office, or organization) individually to determine the nature of engagement in continuous improvement and data use, and then we systematically analyzed patterns and factors associated with patterns across cases (Miles & Huberman, 1994). We also reviewed state policy materials including State Board of Education reports, memos, and statements of model practice. In this section, we discuss the three main ideas we derived from the interviews:

1. The California School Dashboard provides needed information about school performance but is insufficient for continuous improvement.
2. To better support continuous improvement, school districts are developing local data systems, but there is wide variation in capacity to do so across the state.
3. The capacity to use data for improvement remains challenging for most districts.

**California's School Dashboard and continuous improvement.** In our interviews, the School Dashboard garnered mixed reactions. For some districts and COEs, the School Dashboard offers a baseline of data and increased opportunities to review and analyze their

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[9] https://www.ed-data.org/

[10] https://www.cde.ca.gov/ds/sd/cb/dataquest.asp

[11] http://www.caaspp.org/

[12] Interviews were conducted during the summer of 2017 and utilized semi-structured interview protocols, which were recorded and transcribed. Our research team conducted 41 interviews with 56 leaders from state agencies (n=10), county offices of education (n=3), local education agencies (n=20), education associations/advocacy organizations (n=3) and technical assistance providers (n=4). Our purposeful sample consisted of technical assistance providers and state level leaders who were responsible for executing continuous improvement strategies. County offices of education and local education agencies were similarly selected based on identified engagement in continuous improvement, and also to represent variation in enrollment, geography, urbanicity and student demographics. To analyze, we used a multiple case study design (Yin, 2013), conducting cross-case analyses (Miles, Huberman, & Saldaña, 2013) to identify common definitions and practices across respondent groups (e.g., district leaders, support providers, and policymakers).

data, and it puts a spotlight on student populations that are underperforming. As one state policy maker characterized it, the School Dashboard provides a "standardized tool to start the conversation [for districts]." This is particularly the case for smaller districts with limited research capacity. One county administrator reported that, for one such district, the School Dashboard data revealed problems of practice that were previously invisible:

> Just having the School Dashboard to point out that, "Hey, you have the lowest indicator overall for math." That one superintendent was very surprised by that, and when we talked a bit more with him, he had not yet adopted materials for the Common Core math. We now have a team out there working with him—it was because of the conversations around the data.

Another county administrator pointed to the impact of the School Dashboard on highlighting vulnerable student populations:

> We provided a training for districts to ask, "What are the data saying about foster youth, [English learners] and low-income [students]? And what kind of actions make a difference?" Wanted them to think about it in terms of their LCAP. They were overwhelmed by it. We are coming back to this conversation this year because they now have data on this.

In these instances, data from the School Dashboard help to illuminate problems in performance at the system or school level. However, respondents brought up two main issues with using the School Dashboard data for improvement.

First, many district and COE leaders were concerned that the state is working with "post-mortem data" and that this limits their ability to engage in continuous improvement. State assessment data are not recent, leading one district leader to describe using state data as an "autopsy":

> The state data is great and it helps give us a good picture of what happened the year before, but it's really an autopsy. We need to be able to look at the data as the year progresses and get that data into the hands of our sites and our teachers so that they can make adjustments accordingly.

A county office administrator also conveyed concern about the lag in data and its impact on districts to engage in continuous improvement strategies:

> [D]istricts are concerned about the delay in release of the state's School Dashboard. If the School Dashboard's not going to come out until December this year, and that's already halfway through the year…. what do we do from July until December, when it comes to looking at strategic planning?

Second, the data available on the School Dashboard is currently limited in that it offers only a static, summative view of whether or not progress has been made from year to year. For this reason, the majority of respondents noted the importance of more frequent data to monitor progress and change course when needed. One county office administrator offered this example:

> When it comes to continuous improvement, it's a recognition that we are expected to respond frequently and immediately… so that we can respond to data, and shift the system in order to meet the need of the students on a more regular, more frequent basis.

Having more frequent data is critical to informing the various phases of the improvement process, particularly within PDSA cycles. For this reason, districts and COEs are increasingly turning towards local data systems that enable the ongoing, systematic collection and analysis of real-time local data. These data systems help educators at all levels of the system to identify and develop more specific, targeted supports and to make immediate adjustments throughout the school year to improve educational outcomes for students. We turn to this idea next.

**Local data systems for continuous improvement.** More than half of the 20 district leaders interviewed for this study reported conducting systematic analyses of locally generated data to inform their improvement efforts. Some district leaders are developing increasingly robust internal data systems that include multiple measures and access to local, real-time data such as student attendance, grades, or assessments. Other districts are also incorporating stakeholder survey data (e.g., school climate surveys) and observational data garnered through classroom and school site "walkthroughs." Approximately 11 of the districts interviewed had already developed and implemented internal data systems, and three were in the process of developing systems. As one administrator described:

> We have a local dashboard system that we report on our own, local data a couple of times a year. Then, we also have a data warehouse, which is a live connection to our student information system and our student achievement records that everybody from teachers, to principals, to counselors, to assistants can use to look on a daily basis to things like student attendance or student grades or student achievement.

A district superintendent shared how their district has similarly been developing a data warehouse with more formative day-to-day data that are accessible to everyone throughout the school year:

> For example, instead of waiting for suspension data, we want to get referral data in there this year so we can track that school culture from day to day. Are we seeing an increase in referrals? Are we seeing referrals from certain teachers or parts of the school? And address those issues more frequently.

However, many respondents asserted it would be helpful for district and school leaders to have systems that would enable them to see associations between changes in strategies and changes in outcomes at various levels of the system. However, current data systems are not adequate for helping districts monitor progress against a specific goal or target for a specific improvement project. As one technical assistance provider stated:

> If you've got an improvement project trying to find gaps, and your employees need two or three strategies to get there, and you want to monitor both your implementation of the strategies right next to what's happening with chronic absence in the targeted classrooms or schools, there's no system that lets you do that, that I know of. Which means that it requires the local user, maybe whoever is leading that project locally, to sort of cobble this stuff all together.

COEs also caution that while these efforts are promising, districts are in different phases of having their own data systems and have different levels of organizational capacity. Some smaller districts, in particular, do not have research departments to implement or manage the types of internal data systems that support improvement efforts. Noting the wide variation among districts, one COE administrator said:

> Our districts are in different phases of having their own data systems where they can produce more timely information that can be used to inform instruction and adjust practices during the year. It just depends on what the district has and can pull forward…. I'm not sure that the districts have gotten to a place where they can make really strong use of that data to inform what they do.

**Building capacity to use data for improvement**. Because "data don't drive," simply having more frequent data, while necessary for continuous improvement, is insufficient. People at all levels of the system also need to know how to make good use of data—analyzing it to understand variations in performance and evaluating whether new investments have changed outcomes. As discussed above, this requires strong organizational capacity to support skill development among practitioners along with the norms, culture, and mindsets to support data use. A district administrator described the need this way:

> I think one of the pieces is that we need to be better at helping our site administrators know how to lead [data] conversations. And how to help them to be very versed in the data. Not only what the data says and where they see the gaps, but what they can do to change that outcome.

We found not only a wide variation in district capacity to use data for improvement but also examples of promising practice and concerted effort around building capacity. For example, a number of the district leaders we interviewed described having district-wide and school-level teams who conduct regular, systematic reviews of data to inform instructional change and to determine what additional support systems and mechanisms are needed to promote student learning and achievement. These teams can include board members, cabinet

members, central office administrators, school site leaders, teachers, and classified staff. Several district leaders noted that they situated this work initially at the district level, before delving in more deeply at the school site level. For other district leaders, this process is embedded at the school level in Professional Learning Communities (PLCs) and Instructional Leadership Teams (ILTs). A district superintendent described ILTs as the "unit of implementation" at the school site level:

> We've invested a lot in building our site leadership capacity and instituting an Instructional Leadership Team at each of our sites…. To varying degrees of quality, they're engaged in analysis of data, of reflection on needs, and then putting in plans to address those needs.

Another superintendent pointed to the role of PLCs in analyzing data for improvement: "So at a teacher level, in a PLC, they are looking at very real-time data associated with their instruction, and they're able to make those kinds of changes regarding lesson planning and lesson delivery, on a more real-time approach."

District leaders are also working to create a culture in which data analysis and monitoring are ongoing as well as to increase the capacity of district personnel at all levels to collaborate around using data for improvement. One district superintendent described it this way: "What I mainly focus on is building leadership capacity around mindsets that are necessary to get fear out of the organization…. Creating safety's been very important. Creating competency at the site level was important…." Another district superintendent noted:

> I think that we've successfully shifted the culture around viewing improvement as not a thing to be afraid of and shifting this notion around punitive accountability to we all are accountable for improvement…. Now I think it's common practice for teachers to get in each other's classrooms. It's common practice for principal meetings to be focused on student data and instruction rather than compliance. It's common practice that we're able to and willing to look at the brutal facts of where we are with a lot of our kids and resist making excuses or blaming kids or families because of that, because of those results.

In a continuous improvement framework, people at all levels of the system need to know how to make good use of data, how to analyze it to understand disparities in performance, and how to evaluate whether new investments have changed outcomes. This requires skill development among practitioners and often, as noted above, a shift in the culture of data use. And sometimes, as one district administrator observed, this can also simply mean unlearning poor practices and prior assumptions about data use: "I think probably one of the biggest barriers is to help people overcome just un-useful practices."

Districts also need support to learn how to more effectively use data to inform investments and to document when an investment is strategic. In many districts, administrative functions are siloed, and there is a lack of understanding about program evaluation or how to

align goals, programs, and dollars. A district administrator described the complexities of the new system and the challenges it presents for districts:

Because we now have these School Dashboard indicators and we have three years of state assessment data now, it's figuring out are the dollars that we have allocated to these actions and services, are they working? If they're not, should we reallocate funds and focus that in other areas so that we can really get the improvement that we're looking for? It's not as black and white as it was years ago.

State policymakers, technical assistance providers, and COE administrators interviewed similarly identified the need to increase districts' capacity and expertise to generate and utilize more timely local data to impact the classroom. One state policymaker acknowledged, "There needs to be a conversation on how we invest in resources to empower districts to use the data they collect and not wait for a School Dashboard. There's definitely a hole in our system."

## Learning From the CORE Data Collaborative

To fill this gap, over 50 school districts have joined the CORE Data Collaborative for access to better data and a collaborative structure for its use. The Data Collaborative is an outgrowth of the original CORE districts' work and is designed to provide better data for educators as well as an infrastructure for building capacity to make use of data for improvement. The CORE Data Collaborative provides a unique opportunity to understand and learn from districts and counties that have opted into a data system to supplement the state's data.

To understand the data and analytics available in the CORE measurement system and how these resources are being used across the state, we interviewed leaders from nine districts and two COEs that are members of the CORE Data Collaborative and interviewed staff in the "CORE hub," the intermediary organization that supports the work of participating districts. We also observed in-person and virtual Data Collaborative meetings and reviewed training and meeting materials. In addition, we reviewed preliminary findings from interviews with 16 district and county CORE Data Collaborative members conducted by McKinsey & Company.[13] In what follows, we will first provide background on the CORE districts and the development of the CORE Data Collaborative. Then we will discuss the data and analytics available in CORE's measurement system and the capacity-building and networking opportunities available to members. Finally, we will share the benefits and limitations to the Data Collaborative in participants' own words.

### Background on CORE and the Data Collaborative

The CORE districts first developed their measurement system under their NCLB waiver. The guiding principle of the CORE districts in their use of multiple measures under this

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[13] Our interviews were conducted in Summer 2017; McKinsey & Company interviews took place in December 2016.

accountability framework is that data should be used as "a flashlight, not a hammer."[14] In other words, the CORE districts emphasized that measures should be useful for continuous improvement and not just for accountability. At the same time, they believed that measures should represent all of the aspects of school and student performance, not just the academic subjects that had been emphasized under NCLB. As a result, CORE's measurement system from its inception has focused on academic outcomes alongside non-academic measures of student success, including chronic absenteeism, suspension/expulsion, students' social-emotional skills, and school climate and culture.[15] While ESSA and LCFF now prioritize multiple measures as well, CORE was ahead of this policy shift with its systematic measurement of school and student performance on multiple dimensions, and generated widespread interest in the popular press and policy circles nationwide (Blad, 2015; Bornstein, 2015; Zernike, 2016).

Since the passage of ESSA in 2015, the CORE districts have reconceptualized their partnership, as they were no longer required to implement their shared accountability system. Through developing and executing their waiver plan, the CORE districts established a deep commitment to collaboration and shared learning around their multiple-measures data system. For this reason, in 2016, CORE reorganized as a Networked Improvement Community committed to:

1) Anchoring their shared work in the student and school quality measures in their measurement system, and holding each other accountable for specific outcomes;
2) Looking inward and building coherence within each district as a way to improve the power of each system to improve student outcomes (Fullan & Quinn, 2015); and
3) Using the tools of improvement science to anchor their collaborative work together as a Networked Improvement Community (Bryk, Gomez, Grunow, & LeMahieu, 2015).[16]

While deepening their work together as a NIC, the CORE districts simultaneously expanded access to their multiple-measures data and learning system by inviting other California districts to join their Data Collaborative. Any district was invited to join for a relatively small fee, which includes access to the data system and shared learning opportunities around its use.[17] Districts that join contribute their own student data to the CORE measurement system, all of which is currently in their administrative datasets and sent to the state annually. Participating districts are then able to benchmark student performance against other schools in the data system. Data Collaborative districts engage in structured network learning activities that enhance their capacity to use data to drive system improvement. As of the 2017–18 school year, over 50 California school districts representing nearly a million additional students are participating in the Data Collaborative, including San Bernardino City Unified School District, a consortium of districts in the Silicon Valley (the East Side Alliance coordinated by the Silicon

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[14] http://coredistricts.org/calif-core-districts-pilot-accountability-measures/
[15] For more detail on CORE's implementation of the waiver, see Marsh et al. (2016).
[16] For more detail on CORE's early implementation as a NIC, see Nayfack et al. (2017).
[17] At the time of this report, the fee was $28,000 per partnering agency plus $0.28 per student for professional learning support. This, for example, results in a fee of $30,800/year for a district with 10,000 students.

Valley Education Foundation), the Sweetwater Union High School District, Aspire Public Schools, Green Dot Public Schools, and school districts in Sacramento, Ventura, and Riverside counties.[18] When combined with the one million students already served by the original CORE districts, the integrated data system now represents nearly one third of California's student population.

**CORE's Data System**

The majority of the data used in CORE's measurement system is contained in the state's student data system (CALPADS). CORE gets the data directly from the districts, but all of the data is processed on an annual basis. However, CORE makes this data system more valuable for district leaders by (a) adding additional data sources, (b) using this data to calculate different kinds of metrics, and (c) creating analytics and data displays that enable district and county leaders to look at data in different ways. These data displays are made available to the districts more quickly than the same source data on the California School Dashboard or other public data sources.[19]

Figure 4 displays the data elements in CORE's measurement system. Many of the data elements are also represented in California's School Dashboard and other state data reporting tools, including academic achievement as measured by the Smarter Balanced Assessment Consortium (SBAC) in English Language Arts and mathematics, graduation rate, chronic absenteeism, and suspension/expulsion. However, the CORE measurement system includes additional data sources, which extend the state's data in important ways. First, participating districts can choose to administer surveys of students' social-emotional learning (self-management, growth mindset, self-efficacy, and social awareness) and student, parent, and staff reports of a school's culture and climate (support for academic learning, sense of belonging and school connectedness, knowledge and perceived fairness of discipline rules and norms, and sense of safety).[20] Additionally, in an effort to continue improving and extending the data system, college outcomes have recently been added to the CORE data system via the National Student Clearinghouse.[21] For the 2017–18 school year, college attendance rates by school are included in the data system, with additional metrics being developed for future years.

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[18] See http://coredistricts.org/our-work/data-collaborative/.

[19] In the past two years, participating districts have seen results on the CORE dashboard by mid-August, whereas California state data are not available until December.

[20] For more detail on how CORE's surveys can be used for accountability and continuous improvement, see Hough, Kalogrides, and Loeb (2017).

[21] http://www.studentclearinghouse.org/

**Figure 4.** Data Elements in CORE's Measurement System
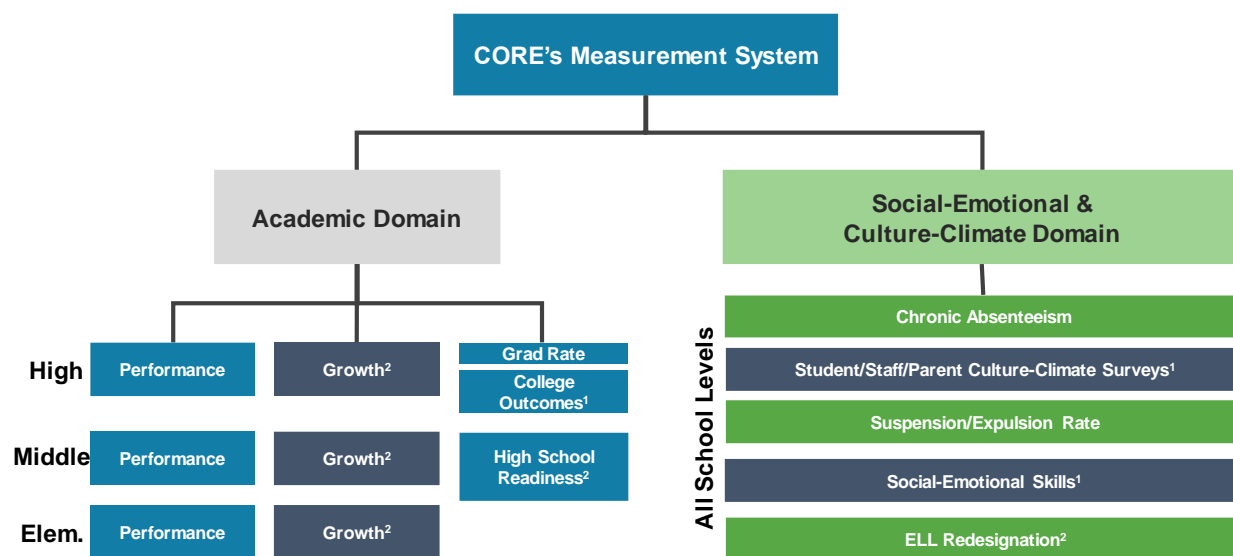


*Note.* 1) Additional data added to supplement state data. 2) State data used to calculate different kinds of metrics.

Additional items in the CORE measurement system represent methods for utilizing CALPADS data to produce more informative metrics for use by educators. For example, CORE has developed and reports an academic growth metric, which is very different from how California state reports test scores. The CORE measure of student growth takes into account an individual student's prior test history, socioeconomic disadvantage, disability status, English Learner status, homelessness, and foster care status, using this information to measure how quickly they grow relative to students similar to them in these categories. The CORE model also accounts for concentration of these characteristics within schools. In this way, the CORE growth measure is constructed as a "value added" model, estimating the school's impact on student achievement relative to other schools serving similar students. Alternately, California's accountability system uses one-year school-wide *change over time* in student achievement, which does not account for changes in student population or the kinds of students a school serves. Additionally, CORE reports a high school readiness score at the middle school level, which is based on predictive analytics demonstrating that combinations of student GPA, attendance, grades, and suspensions are indicative of a student's risk level upon entering high school.[22] Finally, CORE calculates EL redesignation rates in a way that reflects district leaders' concerns about long-term ELs and stagnant redesignation within schools. At the school level, this is calculated as the percentage of students who are reclassified from English Language learner status to "fluent English proficient" out of the number of all the English learners who

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[22] A student is considered ready for high school if they: (a) have an eighth-grade GPA of 2.5 or higher; (b) have attendance of 96% or higher; (c) have no grades of D or F in ELA or math in the final course grade; and (d) were not suspended in eighth grade. At the school level, this is reported as the percentage of students who are high school ready upon completing eighth grade.

are reclassified at a school site in the current year plus all those English learners who, after five years, were not reclassified at that school.[23]

However, arguably the most valuable aspect of the CORE data system is the variety of ways that data can be displayed. All participating districts have access to an interactive data interface in addition to a more static report card. The static report, which was created as part of the waiver, compares schools by level (elementary, middle, high) on a 1–10 scale for each metric, and breaks out each metric by student demographics (race/ethnicity, EL, FRPL, SPED).[24] In our past work in the CORE districts, we found that educators appreciated that these reports contained multiple measures, anchored their school data compared to others, and showed how school performance on each metric had changed over time (see Marsh et. al, 2016).

As useful as these static reports can be, as discussed in the framework above, they have limited use for improvement. They do not help to narrow attention or explain the nature of the problem. This is where the interactive data interface can be important; it was constructed to enable simple, deeper analysis that enables the user to dig into the kind of information that can be found in a static report.

Specifically, the CORE interactive data interface allows for a variety of comparisons between and within schools. First, the tool provides scatterplots to compare any two variables and how schools are distributed across them. As shown in Figure 5, this can involve comparing two outcome variables such as academic achievement and growth in mathematics. A comparison such as this can show which schools have both high academic achievement and higher performance scores (in the top quartile); these sites might be "bright spots," or places to learn from promising practices. On the other hand, schools with both low performance and low growth may need serious intervention to improve. A user can also look at achievement against demographics to see how schools of different sizes or poverty concentrations are performing. To enable this kind of comparison, there are a number of filters that can limit comparisons to similar schools (by size or demographics) or subgroups. The tool can also focus on schools within a given region, for example, within a particular district or county. A comparison like this allows for a school leader to ask, "How does my school compare to others like mine?" A district leader can ask, "How are the schools in my district doing, and how does this compare to other districts?" While a county leader can ask, "How are my districts, and the schools within them, performing?" Each dot on the scatterplot represents a school that is identified by name to facilitate support and collaboration.

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[23] CORE's measure of EL proficiency is slightly different than what is specified in ESSA. Rather than using only test score results to determine progress on English proficiency, the CORE districts chose to report reclassification rates, which are a combination of language proficiency scores and academic performance (Carranza, 2015).
[24] Fresno and Long Beach Unified School districts have made these reports public; they can be accessed at reports.coredistricts.org.

**Figure 5.** Scatterplot of Two Variables on the CORE Interactive Data Interface



Comparing Growth in Math to Proficiency in Math, All Students
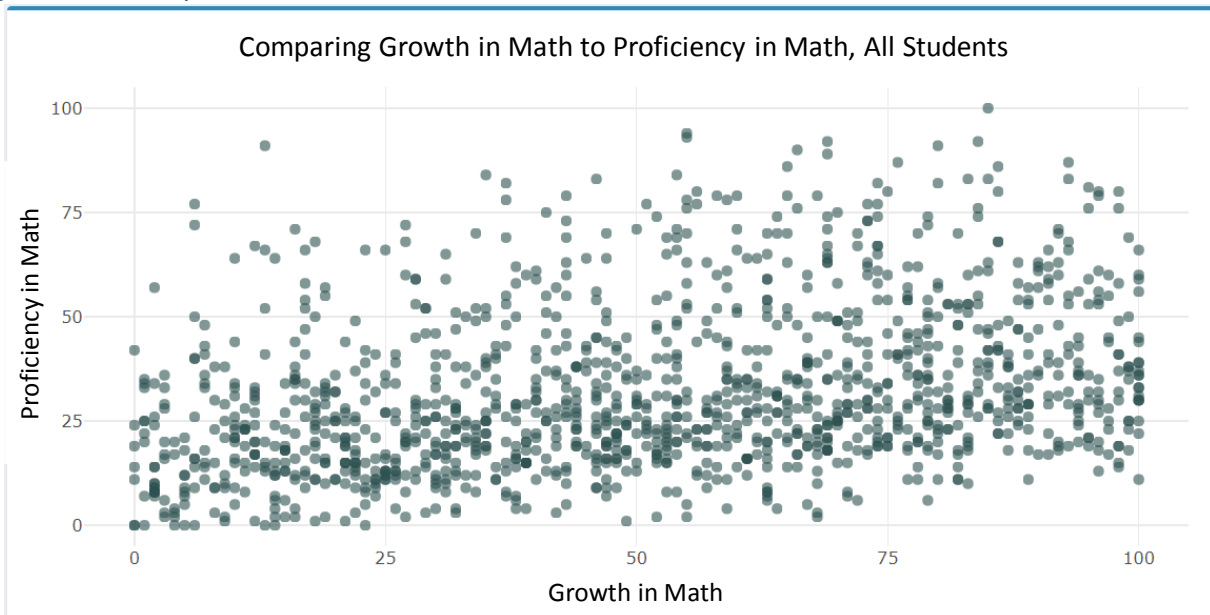
Most of these analyses compare two variables, which is a very useful way of understanding relationships. However, the CORE data system has many measures, and our previous research has demonstrated that a school's performance can vary widely across indicators (Hough, Penner, & Witte, 2016). CORE's interactive data interface provides a bird's-eye view of how all of the schools in a district or region are performing on a given indicator compared to the others. As an example, Figure 6 shows each indicator compared to chronic absence. Through California's five-level color coding, a user can see the proportion of schools that are in each category within a system (e.g., district or county). Each histogram counts the number of schools in each performance category, conditional on their performance category in the chosen metric. This view allows a user to see patterns across all of the indicators. For example, when comparing student reports of school culture-climate to chronic absence, it is apparent that there is a relationship between culture-climate and absenteeism: More schools that are red on chronic absence are also red on school culture-climate, and on the other hand, schools that are blue on chronic absence are more often doing well on culture-climate. This view allows users to see that while schools with red chronic absence often have red culture-climate, this is not necessarily true for the relationship between academic growth and culture-climate. As this bird's-eye view illustrates, CORE's interactive data interface provides ways for the user to drill down into more detail, for example, to see which particular schools are low on each indicator and to highlight patterns.

**Figure 6.** Bird's-Eye View of All Performance Metrics



CORE's interactive data interface also allows for further investigations to understand the problems within a particular school. In these kinds of comparisons, the user can see how performance on a particular metric has changed over time and how this compares to the district and overall trends. For example, Figure 7 shows that in a particular school the students' ratings of school culture and climate are lower in the target school (at only 61 percent of students reporting a positive school culture-climate in 2016–17) than in the district or Data Collaborative overall.25 Benchmarking in this way can be useful, especially on a new measure like school culture-climate, which is required by the state but may lack meaning without being normalized against other schools. In this way, a school or district can know whether a score of 61 is "good" or "bad" relative to other schools. A user can also look at reports for specific subgroups as a way to get more information.

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25 CORE's culture-climate measure includes four constructs: support for academic learning, sense of belonging and school connectedness, knowledge and perceived fairness of discipline rules and norms, and safety. To create school-level metrics, CORE translates survey responses into the percentage of positive responses in each school. For example, a school with a student culture-climate score of "80" would indicate that 80 percent of the survey questions were answered positively by students. For more information, see Hough, Kalogrides, et al. (2017).

**Figure 7.** Trends Over Time in a Particular School Compared to District and Overall Trends



Year Over Year Trends, Student Culture-Climate, All
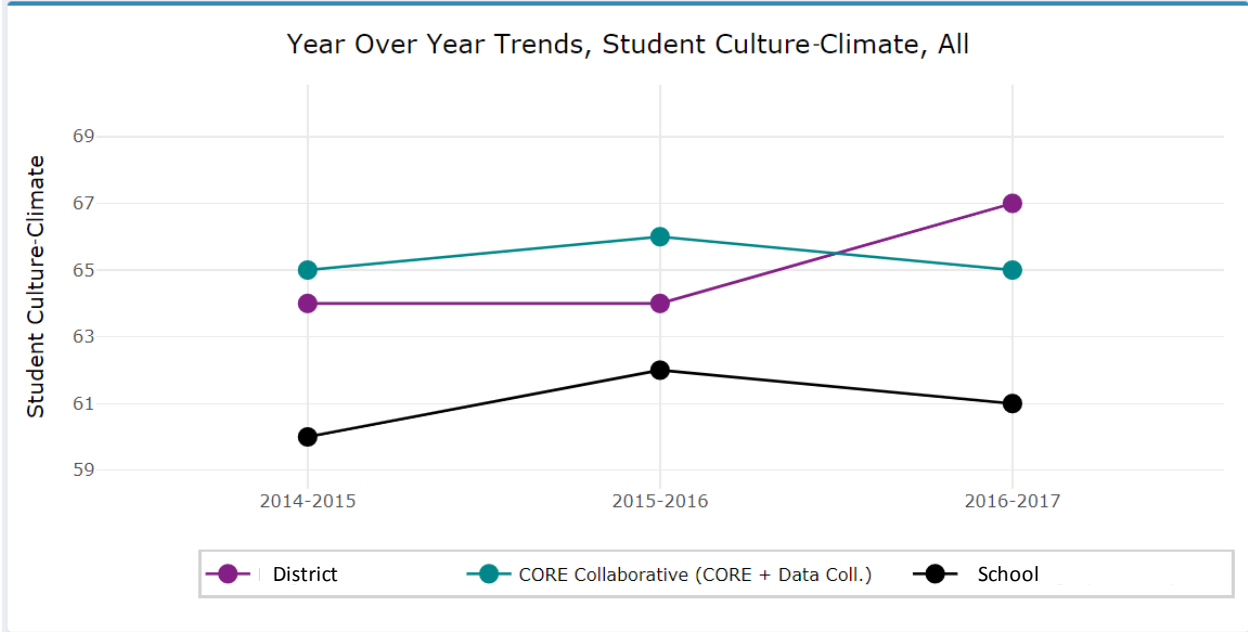
The CORE interactive data interface also allows for directly analyzing performance gaps between different groups of students or grades within a school, as shown in Figure 8. For this school, what looks like average performance (a student growth percentile of 59) is revealed to be a serious problem in sixth grade, where students are growing at a much slower rate than the rest of the network, while students in seventh and eighth grade demonstrate high growth. A result such as this helps to direct attention—instead of solving what could be thought of as a school-wide problem, district and school leadership can focus on supporting the sixth-grade team.

**Figure 8.** Breaking Down School-Level Results by Grade
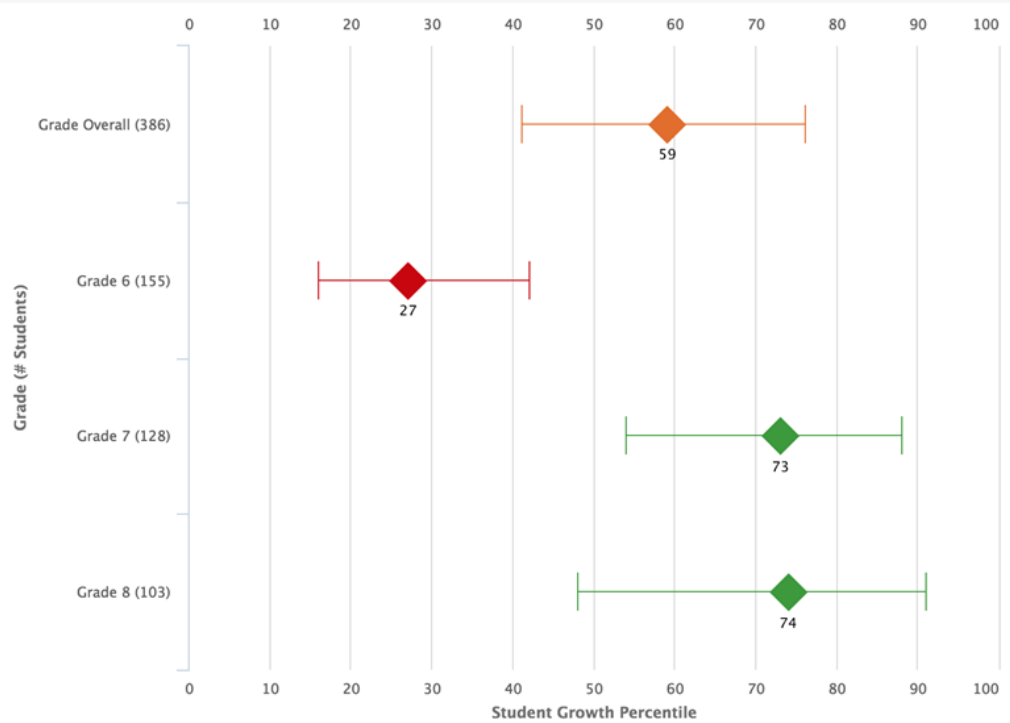


Analyses such as this one are supported by the drill down function within the data interface, which allows the data and research leads in each district to get a results extract, with student-level detail, of the records that make up the scores for each school. Districts can use the extract for their own research or analytics about trends and patterns, or they can take this data to a school team to discuss the performance of particular students. If districts have their own capacity to pull data from their student information system, then this extract may be less useful for creating a research file. However, as discussed above, for districts with limited research or data capacity, it can be very helpful to have all the metrics in one extract, making it much easier than merging many files together from multiple data files.

**Data Use in the CORE Data Collaborative**

The majority of districts interviewed joined the Data Collaborative at the invitation of their COEs, and most signed up during the 2016–17 school year. COEs joined in order to have access to a larger data set and to get better data on district performance across different groups—data which would not otherwise be available to them. Participating districts similarly expressed their interest in being part of a larger data set and viewing their data through a different lens. As one district administrator explained, "They've got a really good data system. We could get feedback on our scores in a different way from what the California Department of Education is giving us." COEs report that they are using the CORE data system to help them track the performance of individual districts and schools. In this way, being part of the CORE data system provides data that is not readily available through the state. As one COE administrator noted, "The idea of seeing how districts or seeing our school sites and grades

within a school site are faring over time is something that CORE can provide that the current data set doesn't provide at the state level." Participation in the Data Collaborative also provides districts with a way of utilizing data that is not currently available to them unless they have robust research offices in the central office. District and COE leaders reported using the data in several different ways.

First, users report employing the data to compare their school(s) to others in the collaborative. This ability to use data to enable cross-district comparisons is regarded by many district and county leaders as one of the main value-added features of the CORE data system. One district administrator shared:

> [Comparing our schools to others] was particularly eye opening because we have a few of our Title I schools that we're very concerned about the score, but when you compare them… they're doing better than expected. They're still low, but better than expected. Gives us a different viewpoint on it.

This kind of comparison can also help to highlight problematic outcomes that might not be visible when only looking at one site's data. As one district administrator recounted:

> When we started working with CORE and we were able to see the reclassification [rates] of other large urban districts at an elementary level, we were blown out of the water because they were reclassifying at a much higher rate. When those kids were reclassified out of elementary they were set up for success in middle school and high school…. We can see a pattern based on the availability of that data, how it was affecting their scores as the kids moved up…

The administrator subsequently shared these findings with the district's director of English language programs who immediately started contacting some of these districts to learn about their programs and practices to support English learners.

Second, respondents reported finding particular value in the unique indicators in the data system. CORE's student growth model is viewed by Data Collaborative members as an especially important and powerful tool and as one that is particularly valued by district leaders, as this administrator noted:

> The CORE growth metric is the single most important piece of data we get from CORE because we can use it to help high-performing schools realize that high scores may not be good enough if their students aren't growing at the same rate as similar students in other school districts. It's also a powerful tool for communicating to a low-performing school that has made significant gains with [its] students in comparison to similar students in other districts. It can help all principals determine how well they're doing in comparison to how well they "should be" doing…. A district research department could do half of that, and determine individual student growth from year to year, but the

CORE data provides us perspective because it answers the other half of the question—"Is that good?"—by giving us the comparative data to similar students across California.

District leaders also found value in the student surveys, even if they do not collect the data themselves. The analysis conducted with these data help district and COE leaders recognize broad patterns in the data that can be applied to their own sites. For example, one district superintendent described seeing important patterns in the student survey data available through CORE:

… I saw a [CORE] data set of some districts who did [the social-emotional survey] with kids [and] they noticed a big fall off in the female students around self-efficacy… and so it just makes you question, "What are female students in sixth, seventh and eighth grade going through?" I think that this data set really sparks a lot of conversation…

Finally, as described above, the CORE data set allows users to drill down to student level outcomes, and Data Collaborative members found this tool to be valuable. Data leads can access the student level records that make up the scores for each school on CORE's interactive data interface, or as one district superintendent characterized it: "This data set allows you to look at the kids."

**Capacity-Building and Collaboration to Support Data Use**

Respondents reported learning a lot from the CORE data system, which helps them better define their problems of performance within schools and districts. However, these data by themselves do little to help district or school administrators determine why a problem is occurring or to identify what changes might be enacted to make improvements. This is where CORE's capacity-building and collaborative structures come into play. CORE believes that these opportunities for networked capacity-building and support around data use are another way in which they differ from what is more generally provided by the state:

> By putting a program lead together with a data lead, and demonstrating how those folks can work together, and how the different information can work together to actually engage in a way of addressing a particular issue, is I think one of the things that we do that's different than the state's doing… that's one element, and maybe the most crucial element that we engage in…

Network activities include monthly virtual meetings that cover a range of topics such as "trends in the CAASPP results," "high school readiness," and "English Learner measures." In addition, there are biannual in-person meetings that are attended by five-person teams from each partnering educational agency. These in-person meetings offer opportunities for members to network, share learning, and better understand how to analyze performance and outcome data. All of these meetings are designed to provide a hands-on, interactive opportunity for members to build their capacity to utilize performance and outcome data, and to share learning with each other. As a CORE leader described it:

> I think what we're doing is we're equipping our reps, our data leads who are there, with the ability to use the data that's here, to do some analytical exploration into one of the

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**Example of Monthly Session Offered to Data Collaborative Members**

A recent monthly session's theme was *"Using the displays to better understand chronic absence for a school in your district."* CORE staff first walked participants step-by-step through where to find data related to chronic absence in the various CORE data sets, and then through a series of "quick explorations" to learn how these data can help to "illuminate the attendance story" for their schools and districts. Some of the available measures and analyses for chronic absenteeism the group reviewed included:

- Chronic absence percentages and performance levels
- Time series graphs by student group and overall
- Bar charts for student groups over time
- Time series comparison to other districts
- Scatterplots to show chronic absence plotted against SD, ELA scores, math scores and suspension rates

Participants were then asked to consider questions such as:
- What patterns do you see between schools in your district?
- What variability exists between "like" schools in your district?
- Is chronic absence increasing or decreasing over time?
- How do the gaps differ by student group?

These explorations and reflections were then followed by a presentation on the chronic absence initiatives being implemented by a leader in one of the member districts, who presented concrete practices that they have used to address chronic absence in their schools, and linked these efforts to data.

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areas represented by the data. To look for variability, to look for best practice possibilities. To look for schools that maybe have gaps or needs that aren't surfacing in any other way, or in any other data set. Then a light frame for how one might engage in learning more about what's going on at that particular school.

To this end, CORE focuses on providing Data Collaborative members with training on how to engage in an improvement process:

This year we're really focusing on the improvement science frame we have. It's around the idea of "seeing the system," doing a causal system analysis, [using] the tools—process mapping and fishbone diagrams, and empathy interviews—as opportunities to try to get more than simply the hard data…. How do I start from the [data] and then actually drill into something that's an area of interest and try to get more information about what this looks like for my particular school?

This idea for how to support Data Collaborative members flows from the work of the CORE Improvement Community (CIC). As we detailed in a recent report (Nayfack et al., 2017), the CIC is still in the beginning stages of its continuous improvement work, but the districts collectively have learned that accessing and interpreting different types of data are critical to building a complete understanding of a problem of practice. For the CIC, analysis began by examining a set of quantitative data reports provided by the network hub. Based on data showing clear gaps in performance, the districts identified math achievement for African American and Latinx students as their target, and then collected additional data to help them think more critically about the next set of activities that would help deepen their team's understanding of the problem of practice. This included interviewing teachers and students and observing classrooms to clarify some of the trends that surfaced in the system-wide data. These qualitative data, which are clearly not part of any shared data system, were a pivotal part of understanding how math was being taught and why math instruction and achievement disparities persisted. As one district improvement lead explained:

We have a lot of great data we use on a regular basis, but some of the things we need to measure we don't have a way of measuring unless we go and talk with the kids and hear their stories. That's a complicated and time-consuming process, but it might be the most effective to figure out how to solve the problems we are encountering.

This process of learning about the system causes of problems highlighted by data in the shared data system is reflected in the activities offered to members of the CORE Data Collaborative. In all of the activities, it is emphasized that quantitative data and analytics from the CORE data system are an important aspect of understanding a problem but are only the beginning of the improvement process.

Many of the members we interviewed had only recently joined the Data Collaborative and thus had limited participation in network meetings, yet they still found them useful and appreciated the network of training and support. We observed some of these meetings, and

several members in attendance expressed how much they valued the opportunity to network with other members and to establish ongoing relationships. One district participant described how much he learns from seeing other districts' approach to using data, noting that, "Sometimes another district is looking at data in a different way, putting a twist on it."

**Limitations of the CORE Data Collaborative**

Based on our interviews and observations, we concluded that while members were generally positive about the network and the support provided by CORE, they were in different stages of understanding and utilizing the CORE data set. Participants have expressed a need for expanded onboarding support, and for training targeted to stakeholder groups (e.g., principals, board members). More specifically, members recommended bi-weekly webinars, some to help new districts' onboarding and others targeted at different ways to use the data. They also recommended on-demand, short e-learning videos for each type of data that districts might analyze. These recommendations point to the need for various users to deeply understand data before they are able to act on it.

Beyond training and support, some members suggested that CORE could play the role of matchmaker, identifying and connecting lower performing districts with those that are showing strong improvement, as described by one district administrator:

> There are probably 30 or so districts now in CORE. But, more than me, at the district level, if I'm a principal, it would be great if they actually gave Principal Smith… a list of, "Here are three other schools in our CORE Collaborative that are similar to you that have similar kids and similar backgrounds, that are having bigger improvements. So, here are those three schools, and here are the phone numbers for those three principals…. We'd love to get you guys together to talk." Or, even better, would be like, "We'd like to bring you together for a session." You know, that session could be electronic, or it could be in person, but if they actually used the data and got down to identifying best-practice principals by different kinds of subjects and groups and they actually made those connections, they did that matchmaking, I think that'd be pretty exciting.

Several district leaders also expressed the desire to be able to identify "what steps, programs, services created the results" and to identify leading indicators. One district administrator likened it to "reverse engineering," while another described the process as "backwards mapping":

> I think what would be helpful would be sort of being able to map back. Okay, so if we were looking at something like A through G completion… going to map it backwards to where is the earliest possible place you could start to identify where you're having problems in that area, and that you could do something about?

Members agree that while being able to identify children in danger of failing sooner rather than later is critical, the more important question is what to do about it? There is a strong desire for the CORE Data Collaborative to help identify and disseminate information on what kinds of programs have been effective at changing course. They also noted a desire for the data provided by the CORE Data Collaborative to be more "user-friendly and actionable."

Finally, CORE recognizes that its data system has some limitations when it comes to supporting continuous improvement, as one CORE team participant acknowledged:

> The [data system] that we have is essentially an annual dashboard…. It's helpful for doing your annual school site planning. It's helpful to see after the fact, so it is post-mortem how the school is moving over time or changing over time…. It's valuable and meaningful in a continuous improvement framework because it's a part of… the work that schools and districts can do to engage in "seeing the system."

Data Collaborative members concur that while this summative data is useful for strategic planning or studying trends, it is not immediately actionable for improving student achievement, particularly in the intervention phase of an improvement process, when they are involved in iterative testing. To move beyond using data to "see the system" and identify gaps or patterns in the data, districts and schools must then turn to locally generated data in order to fully engage in the process of continuous improvement. This kind of local data, specifically on frequent data on student learning, is essential to changing instructional practice at scale. The CORE data appears to be most useful for district and county leaders, and even for school administrators or leadership teams, but potentially less useful for classroom teachers.

## Conclusion and Policy Implications

Data use for continuous improvement, with its adaptive and iterative nature, differs from data use for other purposes. Most importantly, data used in an improvement process must support the needs of the user: Classroom teachers need data to support their students, school leaders need data to support all of the students and teachers in a school, and district and county leaders need data that helps them decide where to provide additional supports or resources as they work to ensure quality across sites. These uses are very different from the data needed at the state level to hold districts and schools accountable for educational performance.

For data to be utilized effectively for improvement, there must be a deliberate structure around their use, with various actors aligned in both goals and process. The specific data necessary to drive improvement also depend on the phase of the improvement process. For example, at the beginning of an improvement process, data needs are geared towards understanding the problem and its causes. When educators are introducing changes, however, data are used in real-time to test whether those changes are resulting in expected improvements. While some of the information that these phases require is readily available, much of the quantitative and qualitative data needs to be collected throughout the process,

often with greater frequency than typical data collection and reporting timelines currently taking place within California's districts.

While the California School Dashboard has been welcomed as an improvement over previous accountability measurement systems, such as the Academic Performance Index, policymakers and educators across the state agree that California's existing data systems are limited as a resource for districts to review, analyze, and make decisions to improve the system. Specifically, the state data system suffers from the following limitations: (a) The static nature of the displays makes it difficult to study trends over time; (b) the "one school at a time" displays make it difficult to compare across or between systems, to benchmark performance, or to identify "bright spots;" (c) limited breadth of data and lack of comparisons across metrics make it difficult to build a holistic, integrated understanding of performance for a school; and (d) the inadequate frequency of data collection limits the ability of schools to track real-time impact as they make changes to improve.

To support improvement, CORE's data system provides educators in the CORE Data Collaborative with tools and supports that make the data more useful. Currently, school districts representing over one third of California's student population have joined the CORE Data Collaborative, which is designed to provide better data for educators and an infrastructure for building capacity to make use of data for improvement. Districts that join contribute their own student data to the CORE measurement system, all of which is currently in the districts' administrative datasets and is sent to the state annually. CORE makes this data system more valuable for district leaders by (a) adding additional data sources; (b) using this data to calculate different kinds of metrics; and (c) creating analytics and data displays that enable district and county leaders to look at data in various ways. Participating districts are then able to benchmark student performance against other schools in the data system and are invited to participate in structured network learning activities that enhance their ability to use data to drive continuous system improvement.

Current participants in the CORE Data Collaborative find this data to be particularly useful for them in the "project definition phase" of an improvement project, when they are analyzing data to build a deeper understanding of the problem. However, for other phases of an improvement process—particularly when testing interventions—these annual data are less useful. When districts reach this phase of an improvement cycle, there is a need to collect and track different kinds of data. This includes data that are locally generated, tracked, and used at the classroom level and school level as well as more frequent data than is currently available in any shared data systems. Given the widespread demand for better data and capacity-building to support improvement, the state could provide assistance in these areas. To this end, we provide three directions that the state could take to better support local efforts around data use for improvement:

**1) Ensure that all districts have access to better tools to make use of data already collected by CDE.** As discussed above, CALPADS data are the backbone of the California School Dashboard and other state data systems, but these source data are not made available to

districts or those who support them in ways that are easy to use. CORE makes this data system more valuable and user-friendly by creating better data displays, calculating innovative metrics, and adding new data sources, such as surveys and links to higher education. This data system is now available to any district that is able to pay a small fee to join the Data Collaborative. Now that the infrastructure has been developed by CORE for California data,26 the additional cost for each district to join is relatively low and could be supported by the state. For example, the state could provide funds for districts to join a data system like the CORE Data Collaborative, which could incentivize better local data use. CORE's development of this data system has been supported by philanthropic investment and can now be leveraged as a statewide benefit. This approach of leveraging the development of technologies and systems is a strategy that the state in general could employ to spread innovation. Alternately, California could develop and manage a state data system, as many other states in the nation have done successfully.27

**2) Facilitate the development of local and real-time data systems to support improvement.** District and county leaders we interviewed discussed unanimously the importance of local data for monitoring progress and evaluating the impact of interventions. Such data include intermediate outcomes, such as student attendance or results on formative assessments, which are often collected in student information systems but may need to be extracted and formatted in order to be tracked over time and used by actors across system levels. The most useful data systems for improvement will also include process and input data that help leaders track implementation of particular interventions. These types of data are not typically collected at scale in school systems, such as the amount of exposure students are getting to an intervention (e.g., tutoring or pull-out support), results from student surveys, data from observations on classroom instruction or other school-based activities, measures of quality of implementation, or finance data to connect expenditures to programs. As discussed earlier, the specific data elements tracked in an improvement process must be locally generated and aligned with the particular improvement initiatives underway within schools and districts. However, the state could help strengthen the infrastructure for these local data systems and their use in two ways.

First, the state could enable local data use by investing in data structures that could be utilized by districts or those that support them. There are a number of local and real-time data systems currently being utilized across the country, as detailed in the Appendix, including many within California districts. Given that California districts have many similarities in terms of context and data that are already collected, the state could invest in developing one or more of these platforms for use by districts across the state. The most promising route would be for California to join the Ed-Fi standards, given Ed-Fi's growing national prominence. Ed-Fi is an open-source technology that consists of a uniform data standard, a centralized operational data store (ODS) and application program interface (API), and various mapping tools for visualizing

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26 CORE's data warehouse and interactive data interface are managed by Education Analytics (http://edanalytics.org), which supports states and districts around the country in using data to make informed decisions on policies and programs.
27 See Phillips et al. (2018) for examples of how other states have been successful in building data systems, including addressing concerns around data security and privacy.

data. Ed-Fi's uniform "Ed-Fi Data Standard" allows districts using Ed-Fi to connect student information, assessment, and rostering systems, as well as to develop and share new applications for using locally generated data. California's investment in Ed-Fi technology could support counties or consortia of districts, like CORE, in accelerating data use for improvement and cost-sharing across districts.

Second, the state could continue to work with assessment providers to ensure that the formative assessment system is optimally designed for alignment and integration with local data systems. Interim data on assessments are an ideal source of formative data for schools, teachers, districts, and consortia, but it can be difficult for educators to access and make use of the data. For example, if the SBAC interim assessments being administered across the state were aligned and compiled in a central location, it would be easier to use the interim data in local data systems, to share across sites, and to build statewide capacity around their use.

**3) Ensure access to high-quality professional learning opportunities around using data for improvement.** As discussed above, "data don't drive" and development of data systems alone will not result in improvement without a strong capacity to make use of data at all levels of the system. To this end, we recommend that the state play a role in building the capacity of actors across the system to use data for improvement. While this support could come from a number of agencies across the state, including the CDE, the California Collaborative for Educational Excellence, the California County Superintendents Educational Services Association, or other consortia like CORE, there must be alignment in approaches to ensure that various professional learning activities are coordinated and support a shared vision of continuous improvement for the state. Key in this regard is the development of common improvement frameworks to guide district and school leaders in their analysis, exploration, idea generation, implementation, and tracking efforts. Additionally, the state could support a process for utilizing data to identify (a) where improvement is occurring so that it can be replicated and (b) where it is lagging so that we can change it. Finally, the various agencies and consortia across the state must coordinate efforts to make certain that all districts in the state can access high-quality opportunities to learn about and be supported in the process of improvement. Given the current wide variation in access to local supports (e.g., Moffitt et al., 2018; Plank, 2018), the state must assure that all districts are given the resources to use data effectively to improve outcomes for their students.

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**Appendix: Real-Time Data Systems That Support Improvement**

**Illuminate Education**

Illuminate Education is an example of a real-time online platform that encourages data sharing and integration (Blair, 2017; "Illuminate Special Education Information System," n.d.). The application program interface (API) provides teachers and other stakeholders access to a range of data, such as student behavior, special needs, demographics, and formative test scores, that are updated in real time. The company offers four core products: Illuminate DnA (Data and Assessment), which houses a platform for teachers to create, administer, and analyze formative assessments to improve instruction; Illuminate K–12 Student Information system, which contains aggregated school data in a central location; Illuminate eduCLIMBER, which is a cloud-based interactive tool providing educators with easy data visualization; and Illuminate Special Education, which streamlines special education processes. One district that has been utilizing Illuminate DnA is Denver Public Schools (DPS) in Colorado, the largest district in the state (Getting Smart Staff, 2017). As of the 2016–2017 school year, Illuminate DnA has been implemented in 61 of the 142 schools within the district. DPS teachers are able to use Illuminate DnA to not only test their students after lessons but to also conduct more comprehensive interim and end of year assessments.

**PowerSchool**

Currently serving 32 million students in 13,000 school districts, PowerSchool is an online real-time platform that helps to reduce data silos within districts by housing student information in one location ("PowerSchool, a leading K-12 education technology platform," n.d.). The platform's PowerSchool Learning management system allows educators to customize and rearrange student data to best fit their needs as well as to share work with colleagues. For example, Oregon Community Unit School District utilizes PowerSchool's central student information system to pinpoint struggling students without the cost of user machine installations ("Oregon CUSD 220 Improves Graduation Rate, Reduces Failing in Classes," n.d.). The district, which previously had separate databases and Excel spreadsheets, relied on PowerSchool to identify that 30 percent of the freshmen class in 2008 received at least one F and to reduce the rate to 19 percent by 2015. PowerSchool is currently expanding, with an expected $1.8 million going into establishing itself in Roanoke, Virginia (Jones, 2017).

**Schoolnet**

Schoolnet, which is an online platform created by Pearson, provides a central system for educators to administer tests and see the real-time reports of the assessments next to the district's student information system. The platform offers four modules: the Account module helps track student performance in accordance with school improvement plans; the Align module ensures that the district curriculum and instruction are aligned with student performance; the Assess module streamlines the process of administering benchmark assessments; and the Outreach module allows districts to share information with the greater

community. The highlighting feature of Schoolnet, however, is that district leaders are the "driving force" of the platform; that is, districts get to choose the specific services provided to their educators within the system. For example, Austin Independent School District (AISD) in Texas turned to Schoolnet to implement an integrated data warehouse that created "actionable" data for teachers and kept all information in one system (Schoolnet, 2012). Through the new system, teachers in AISD are given student profiles and behavior histories to which they did not access before. As a case study of three different districts using Schoolnet conducted by the Consortium for Policy Research in Education (CPRE) in 2004–2006 found, however, teachers who receive more training on using Schoolnet are more likely to be optimistic about its value, and district staff are key in successful implementation (Consortium for Policy Research in Education, 2007).

### Ed-Fi

Ed-Fi is an open-source technology that consists of a uniform data standard, a centralized operational data store (ODS) and application program interface (API), and various mapping tools ("What is Ed-Fi?" n.d). Given the lack of consistency in the numerical codes assigned to students in various data systems that districts use, Ed-Fi created a uniform "Ed-Fi Data Standard" that allows districts using Ed-Fi to connect student information, assessment, and rostering systems. Tennessee's Shelby County Schools, for example, has allowed educators to keep a roster of students who may need additional help in an after school tutoring program in one location rather than logging onto different systems (Kebede, 2016). Many independent platforms currently use Ed-Fi standards and technology, such as Certica's Data Connect and InnovateEDU's Cortex. The Cortex draws from the Ed-Fi ODS to collect data indicators multiple times a day and allows educators to view this information (Certica Solutions, 2017). Relatively new, InnovateEDU's platform was recently piloted at Providence Public Schools in Rhode Island and Achieve First charter schools in the 2016–2017 school year (InnovateEDU Cortex, n.d.).

### Edupoint

Edupoint's Synergy Education Platform contains multiple systems, such as the Synergy Student Information System (SIS), Assessment, Learning Management System (LMS), Analytics, and Special Education (Synergy Analytics, n.d.). The SIS, for example, includes metrics such as demographics and discipline, dashboards, and over 300 pre-built reports so that teachers can analyze data in real time throughout the year. By condensing all of the various data management pieces into one central platform, Edupoint's Synergy allows districts such as Mesa Public Schools in Arizona to input student information online so that educators do not have to manually update the data and parents can view the indicators as well (Edupoint Educational Systems, 2017). Synergy has also recently partnered with San Diego County Office of Education to implement its platform in several of the county's school districts.

**Schoolzilla**

Schoolzilla is a K–12 online data platform that integrates a data warehouse with school dashboard profiles and protected data sharing options ("Why Schoolzilla?" n.d.). The platform, which updates district information on a daily basis, allows educators and administrators to view data points by subgroup as well as by student. Rocketship Education charter schools, for example, currently use Schoolzilla to serve their 90 percent free-and-reduced price lunch student population (Tansey, 2014). Although Rocketship Education teachers were previously unable to see detailed benchmark test data in order to inform instruction on a student level, they now have access to reports created through Schoolzilla's platform that track an individual student's performance on test subsections throughout the year.

**BrightBytes**

BrightBytes offers its Clarity and DataSense platforms that follow its unique approach: 1) integration of data; 2) research through partnerships with universities and organizations; 3) analysis of needs; and 4) data-driven recommendations. The K–12 Clarity platform provides data analytics support that converts complicated analyses into actionable next steps for improvement. The DataSense platform is BrightBytes's data integration solution that collects, translates, and cleans data in a centralized location for customers. In addition, DataSense allows for a streamlined process of reporting data to the State Department of Education and makes it easier for educators to track and share data points from different sources. In 2017, BrightBytes partnered with San Bernardino County Superintendent of Schools to assist in establishing data transparency under the new San Bernardino Countywide Education Open Data Platform (BrightBytes, 2017). More recently, the platform has announced an eight-year collaboration with Georgia's Henry County Board of Education to support the district's personalized learning efforts through creating a one-to-one digital learning environment (BrightBytes, 2018). BrightBytes is also currently expanding its offerings from its award-winning Early Warning module and designing a Student Success module that will identify both students at-risk of not graduating and of not succeeding in postsecondary school.

**Student Insights (Somerville Public Schools)**

A few districts, such as Somerville Public Schools (SPS), have created their own open source data software in recent years ("The Boston Foundation awards Somerville Public Schools a two-year $200K grant," 2017). SPS's Student Insights software gives its schools access to real-time information on student performance, history of student behavior, and recommendations from teachers and administrators. The software also sends teachers email alerts if a particular student's absences increase unusually. Through this centralized data system, SPS encourages its teachers to make incremental improvements to their teaching practices based on their students throughout the year. Although SPS is currently expanding Student Insight's features to include analytics and an option for students to input information about themselves into the system, several other districts, such as Fall River and New Bedford, are already starting to implement Student Insights.

**Project Unicorn, A Data Interoperability Initiative**

Alongside independent online platforms that are currently being created, there have been recent efforts to create communities around the idea of strengthening data sharing in the K–12 education system. Project Unicorn is one example of a collective alliance of over 200 school systems, foundations, non-profit organizations, and vendors that advocates for secure interoperability in districts across the nation (Project Unicorn: A Data Interoperability Initiative, 2017). Although the alliance does not recommend products or data standards, it provides a shared rubric for districts and vendors to assess whether they are moving towards improved data interoperability and enabling educators to make informed improvements in their classrooms.