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Improving California's Teacher Data System to Better Inform Decisions

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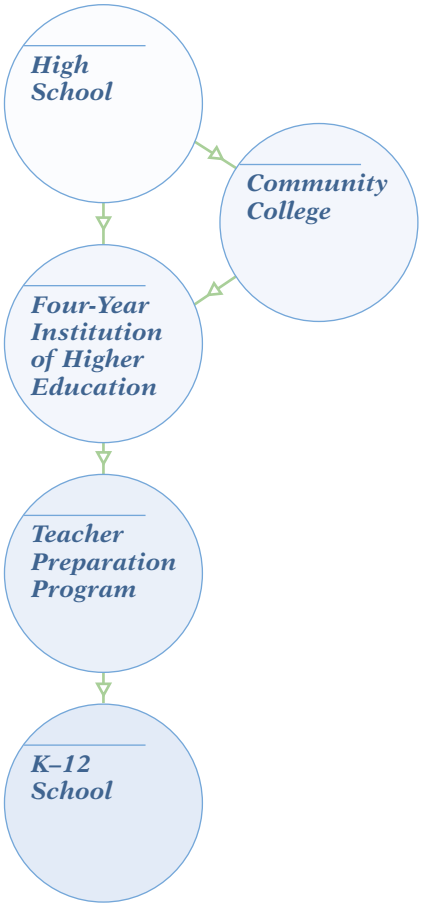
This knowledge brief is part of a continuing series designed to inform California education leaders about new research findings on key state policy topics. It summarizes recent findings on improving the access to, and the use of, teacher workforce data in California, and focuses on the importance of instituting a statewide teacher data system that allows for the tracking of individual teachers and groups of teachers over time, from their preparation through their credentialing, induction, placement, and retention on the job.

Understanding how California's public school teachers progress into and through the teaching workforce helps education leaders know whether the state's overall teacher development system is producing the teachers that students need and to what extent efforts intended to strengthen the workforce are functioning as planned and producing desired outcomes. Key to that understanding is having linked, longitudinal data that would enable systems to track teacher candidates, individually and collectively, over time, from when they enter and then complete a preparation program, to when they first take a position in a K–12 school on through their continued work as teachers (fig. 1). Such data could yield helpful insights for state policy leaders, those leading teacher education programs, and others seeking to improve local teacher preparation and readiness.

Having a more comprehensive understanding of the teacher workforce is critical for California education leaders and policymakers. For several years, the state has experienced persistent shortages — both of fully qualified teachers in general and, within that category, of teachers of color. The inequitable distribution of those who are fully qualified has resulted, for example, in students of color being taught by underprepared teachers at much higher rates than their White peers (see, for example, Darling-Hammond et al., 2018). In addition, the relative shortage of teachers of color and their distribution has meant that students of color are taught at higher rates than White students by teachers who do not share their racial or ethnic identities (Carver-Thomas, 2017).

Over past decades, California has invested in various initiatives to remedy such shortages, but without a linked, longitudinal data system to monitor the teacher workforce over time, the state has been unable to answer basic questions about the effectiveness of those efforts. If teacher-related data were more systematically collected, managed, and shared, these data could, for example, reveal entry and exit patterns for teachers of different subjects and training backgrounds and show the productivity — in terms of recruitment and retention — of different pathways into and investments in teaching. To support more effective management of supply and demand, California's teacher workforce data need to be more consistently collected and to be more accessible for analysis over time, so as to inform policy decisions and improvement efforts.

Figure 1. Basic teacher education progression



Note. Some teacher preparation programs are integrated into four-year institutions of higher education, while others are integrated into local teaching positions.

Having linked, longitudinal data about California teacher candidates and teachers is a state policy priority today. Governor Gavin Newsom recently dedicated one-time funding of $10 million to development of a linked, longitudinal statewide K–12 data system.[1] A portion of these funds supports a statewide "Cradle to Career" working group that includes leaders from the California State Board of Education, the California Department of Education (CDE), the California Commission on Teacher Credentialing (CCTC), and the University of California (UC) and California State University (CSU) systems. The group's charge is to make recommendations, in 2020 and 2021, about the system, such as which data elements should be prioritized in the integrated system, which entities should have access to the data, and how the system should incorporate key workforce data elements (Petek, 2019). Progress on this last front — workforce data — may take more time than developing student data specifications. But, ideally, there will eventually be a requirement to link teacher data across preparation and K–12 institutions and to disaggregate those data to the levels deemed most useful for addressing state policy questions and for informing improvement within systems and specific institutions.

Implications of having linked, longitudinal data for state policy

At the state level, having linked, longitudinal teacher workforce data could help California leaders to better understand teacher shortages and to track key efforts to strengthen the teaching workforce. Among such workforce improvement efforts in California are recruitment programs,

1 The goals of the relevant state legislation, enacted in 2019 and known as the "Cradle-to-Career Data System Act," include enabling partner entities to share information; tracking indicators "to enable parents, teachers, health and human services providers, and policymakers to provide appropriate interventions and supports to address disparities in opportunities and improve outcomes for all students"; and enabling "agencies to plan for and optimize educational, workforce, and health and human services programs." The required state workgroup is authorized to "assess and recommend data system structural components, processes, and options for expansion and enhancement of data system functionality" and to "advise ongoing efforts to develop, administer, and enhance the data system" (Cradle-to-Career Data System Act, 2019).

loan-forgiveness programs, and the improvement of high-quality workforce development programs. Two examples of such efforts are the CSU system's multi-year initiative to make its teacher education programs more clinically oriented (Miller, 2020) and the state's recent and significant investment in teacher residency programs.[2] A chief goal of these policy efforts is increasing the supply and retention of quality teachers in high-need subjects and schools.

Understanding the success of these and other improvement efforts or investments requires tracking teacher candidates as they move into positions in California public schools, and then as they continue teaching in those schools, over time. However, as of yet, there is no central system for monitoring the progress of these individuals over the course of their working lives. Individuals' employment information, which is maintained by CDE, is not currently linked to information about their credentialing institution(s), which is maintained by CCTC. This means that, typically, each preparation program and/or initiative leader must collect, link, monitor, and report placement and retention data on their own. Or, worse, it means that these data are never collected and reported at all — a missed opportunity to learn about the effectiveness of certain programs and interventions, knowledge that could inform future state policy and investments. Thus, California's education policy leaders lack the information needed to know how different investments in teaching might be paying off in terms of improving recruitment and retention patterns, particularly among teachers of different subjects and training backgrounds, or if and how certain programs may be better able to attract and retain teachers of color (Guha et al., 2016).[3]

2 Research suggests that, compared with traditional preparation programs, teacher residency programs can yield more diverse candidates who are more likely to teach math and science and who are more likely to remain teaching over time (see, for example, Papay et al., 2012).

3 Reviews of local control accountability plans across California suggest that the state's school districts spend millions annually on teacher recruitment and retention, with some having only limited ability to assess the efficacy of these efforts.

Implications of having linked, longitudinal data for local improvement

At the local and regional levels, having linked, longitudinal teacher workforce data could also help leaders of teacher preparation programs know where to focus their efforts and where best to apply their limited time and resources in addressing key problems (Bell et al., 2018; Bryk et al., 2015). If a preparation program had data about where its own completers teach and how long they stay in positions, it could use this information for continuous improvement, by identifying any gaps in program performance. For example, data could show that completer employment and retention are weaker than desired for individuals who have gone through certain programs, for those who take jobs in high-poverty schools, or among teachers of certain racial or ethnic backgrounds. Based on those data, program leaders could assess their existing processes and, as needed, undertake improvement efforts (Grunow & Hough, 2018). Such improvement work might involve reexamining programming around coursework, clinical placements, and/or mentoring (Takahashi et al., 2019). This type of continuous improvement focused on key aspects of the program is already underway in many teacher preparation programs in the state (White, Hirschboeck, et al., 2020; White, Takahashi, et al., 2020).

California's current teacher data context

In California, different information about the respective status of individual teachers and teacher candidates has historically rested in different places, with some held by teacher preparation programs and some by CDE and/or CCTC.[4] The unique identification numbers needed to link teachers as they move from preparation into and through employment also exist, and the state has had a

4 CDE and CCTC both publish a variety of descriptive teacher workforce data online, albeit aggregated at a relatively high level, including a variety of staff data files from CDE and summary results from CCTC's annual statewide Program Completer Survey.

history of policy discussions on how to connect these data for robust analysis of workforce trends (see The CalTIDES Story in the following sidebar). However, key issues related to privacy protection and to data transfer, management, storage, and the matching of individuals across institutions over time have not yet been resolved in any systematic way across institutions, thus preventing the necessary data linking and, in turn, analysis or research that would lead to understanding of important workforce patterns (Darling-Hammond et al., 2018; Reed et al., 2018).

The CalTIDES Story

Established in statute in 2006, the California Longitudinal Teacher Integrated Data Education System (CalTIDES) was created for "developing and reviewing state policy, identifying workforce trends, and identifying future needs regarding the teaching workforce." It also was intended "to provide high-quality program evaluations" and "promote the efficient monitoring of teacher assignments as required by state and federal law" (Taylor, 2016, p. 70). CalTIDES would have linked teacher data across several state agencies, and state officials spent years working through linkage and privacy issues among key agencies. At the time, the state had received $6 million in federal funding to create the database. In the end, however, due to various challenges, CalTIDES was never built. In 2012, Governor Jerry Brown eliminated authorization for the project, citing a desire to "avoid the development of a costly technology program that is not critical" (p.70).

Following a 2016 analysis by the California Legislative Analyst's Office that identified the drawbacks of having no statewide teacher database (Taylor, 2016), in 2017 the UC system dedicated $1.5 million in seed funding to create the California Teacher Education Research and Improvement Network (CTERIN), a group with representatives from UC, CSU, CCTC, CDE, the California State Board of Education, the California Teacher Association, the Association of California School Administrators, the California County Superintendents Educational Services Association, and the California Department of Finance. CTERIN's mission has been to work closely with state agencies (particularly CDE and CCTC) to assess stakeholders' data needs, establish key data agreements, and provide methodological direction to lay the foundation for an effective statewide data system that integrates California's heretofore disconnected teacher databases.

California's teacher-data story has been further advanced by the Every Student Succeeds Act (ESSA) requirement that each state annually report to the U.S. Department of Education its number of "ineffective teachers" and those working "out-of-field," as defined by ESSA (CDE, 2020). To that end, in 2018 the state budgeted $380,000 for CCTC to build a semi-automated assignment-monitoring system for this purpose. The result, in 2019, was the California State (Educator) Assignment Accountability System (CalSAAS), which, with CTERIN, represented another step toward connecting CDE's teacher-placement data with CCTC's teacher-credentialing data. The system is intended, over time, to connect with the California School Dashboard, to allow local stakeholders to better understand local teacher vacancies and/or misassignments (Purdue, 2019).

Data-sharing efforts across California that hold promise

Within this statewide data environment, some groups have made recent strides in leveraging available teacher data to make important strategic decisions. Although they are carried out locally or regionally rather than statewide, these efforts offer lessons upon which California leaders can build for future data-sharing efforts.

The California State University Chancellor's Office and Programs

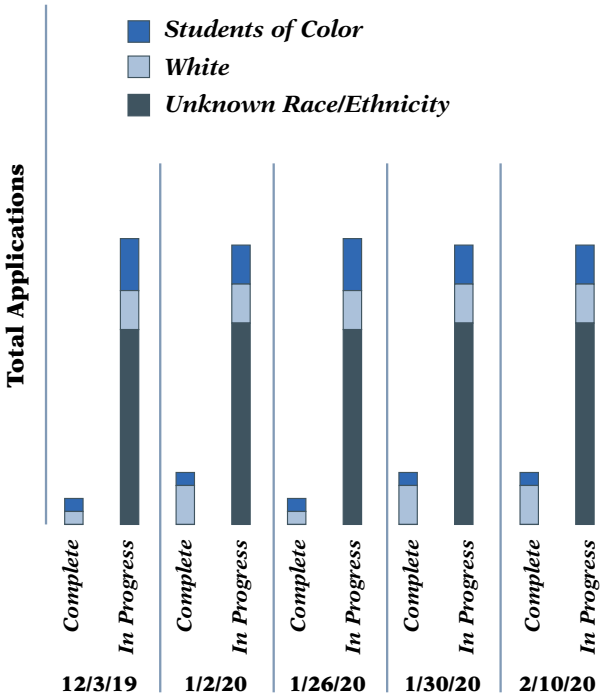
Until early 2019, the CSU system's 23 teacher preparation programs had no comprehensive source of data indicating whether or where their completers took teaching jobs, or how long they stayed in new teaching positions. However, CSU's Chancellor's Office had been working to remedy that problem by trying to negotiate a three-way data-sharing agreement with CDE and CCTC. CCTC did not choose to join, but in spring 2019, a first-of-its-kind agreement was established between CSU and CDE, enabling the statewide linking of CSU teacher-preparation completer records with public school employment records. (Because CCTC does not participate in the data sharing, there is some incomplete matching of records.) The CSU-CDE agreement yields internal reports for each CSU preparation program, showing its completers' employment and retention patterns by subgroup. These reports are not shared outside the CSU system, as they are intended to help system leaders, as well as campus staff and faculty, to refine their own improvement efforts (S. Kolbe, personal communication, May 22, 2020).[5]

The CSU-CDE data are enabling teacher preparation programs to answer critical questions about key issues. Among these critical questions are: What proportion of our program completers accept jobs in California public schools, and how long are they staying in those jobs? In what districts do our program completers take jobs? And, how well do our completers mirror the racial and ethnic populations of the districts in which they work? Informed by clear answers to these questions, teacher preparation officials are taking action to adjust system processes to improve outcomes. For example, the use of the CSU-CDE data, combined with local demographic data, has provided evidence that, in some districts students of color are taught by teachers who do not share their racial or ethnic identities, at much higher rates than White students. This information led to the launch of the Chancellor's Office Learning Lab, a cross-campus network that supports CSU campuses' efforts to ensure that the cohorts of teachers they prepare more proportionately reflect the demographics of the public students they will teach.

At ***Humboldt State University,*** for example, a team within the teacher preparation program recently set out to improve the diversity of its teacher candidates. A first step involved learning more about the student populations that the university's program completers were teaching. The team's initial belief had been that these completers took jobs scattered all over the state, but the CDE employment data available from the Chancellor's Office showed otherwise: Approximately half of the completers took jobs in local districts, with about one in five joining the county's largest district. This information informed the team's strategic goals, leading the team to emphasize the importance of matching the program's teacher candidates to the student demographics in nearby counties. After reviewing the relevant data, the team tested several recruitment and admission activities that members hypothesized would increase the number of candidates of color in the credential programs. To monitor whether the changes being tested were indeed leading to more applications, the team began tracking a key leading indicator of program enrollment — the number of in-progress and completed program applications disaggregated by race/ethnicity. (These disaggregated data were available by request from the university admissions office.) The information allowed the team to create useful data visualizations (such as the one shown in fig. 2), and program leaders were able to track whether their recruitment and admission efforts were yielding intended results — that is, more applicants of color applying to, enrolling in, and completing the teacher preparation program (L. Miller, personal communication , May 18, 2020).

5 CSU system leaders intend to make these types of data reports more accessible over time, via a new set of dashboard tools now in development.

Figure 2. Humboldt State University's in-progress and completed applications, by race/ethnicity



Source: Humboldt State University; used with permission. Note that counts have been removed at the request of Humboldt State University Officials.

In another CSU improvement initiative for teacher preparation programs, ***California State University Bakersfield*** (CSUB) began developing and implementing a teacher residency program in 2014, in partnership with three small rural districts in Kern County. CSUB has since expanded its model to several additional districts in in the county. As program leaders recently emphasized in interviews as part of a recent WestEd evaluation (Tejwani et al., 2019), CSUB has been focusing closely on placement and retention data to inform program development and improvement. CSUB residency leaders track completers' job placements and then connect with completers later (via follow-up interviews or surveys) to explore changes in their working environments. For example, if program leaders see that one of the program's completers was not rehired by a district, they reach out to that individual to understand what the challenges were in their initial placement and how CSUB could have better supported them during preparation and induction. Program leaders engage in similar efforts when a completer moves from one district to a different type of district, such as from a rural district to an urban district. Also, when a low hiring rate was evident for an early residency cohort, CSUB had conversations with its district partners and used the input to heighten the program's focus on its students' interview preparation and on better alignment of program content with districts' literacy efforts. In addition, in response to feedback from program completers, CSUB implemented a weekly one-hour resident learning community that allows residents to discuss their struggles and engage with their peers to problem-solve. CSUB leaders also used their program's completers' placement and retention data as they expanded district partnerships, because these data indicated the districts in which their program graduates were being hired — and, thus, which additional districts might be interested in collaborating with the preparation program (K. LaGue, personal communication, May 4, 2020).

Los Angeles Educator Pathways Partnership

The Los Angeles Educator Pathways Partnership (LAEPP) is a research effort among the L.A. Compact,[6] the Los Angeles Unified School District (LAUSD), and six L.A.-area institutions of higher education (IHEs),[7] with facilitation assistance from UNITE-LA. The intent is to use data to improve teacher preparation, teacher retention within LAUSD, and, ultimately, student learning. In 2013, LAUSD and each IHE signed bilateral agreements (renewed every several years) to initiate a coordinated regional data-sharing and research effort — while also protecting confidential teacher-candidate and employee data.

6 The L.A. Compact is a group of more than 20 regional leaders and organizations from the education, business, government, labor and nonprofit sectors that came together in 2008 to improve cradle-to-career outcomes for students.

7 The higher education institutions participating in LAEPP are CSU Dominguez Hills, CSU L.A., CSU Northridge, Loyola Marymount University, the University of California Los Angeles, and the University of Southern California.

LAEPP efforts and the findings from its data analyses to date have created a much-needed feedback loop for teacher training and retention in the nation's second-largest school district. Data sharing has given the IHEs a new perspective on local teachers' working conditions — including a better understanding of the relationship between school administrator longevity and teacher retention, and of the differing job environments among special education teachers — and that perspective informs changes in teacher preparation at the IHEs. The project seeks to further inform teacher workforce development efforts by identifying best practices and developing collaborative strategies for the affiliated preparation programs to co-design clinical experiences. The group's most recent analyses are specifically focused on improving STEM teacher education, performance, and retention, with the answers to a new set of research questions ready to be analyzed and presented in dashboards and narrative reports for each IHE (L. A. Compact, 2020). LAEPP will also engage in predictive modeling to better understand the factors that accurately forecast teacher retention, and its research will be utilized for program improvement in each university teacher training program and in LAUSD (D. Guan, personal communication, May 28, 2020).

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