Addressing California's Growing Teacher Shortage

2017 Update

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LEARNING POLICY INSTITUTE

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Table of Contents

List of Figures and Tables

Executive Summary

In a January 2016 report on teacher shortages in California, *Addressing California's Emerging Teacher Shortage: An Analysis of Sources and Solutions,* the Learning Policy Institute found that there were too few qualified California teachers to meet the growing demand of school districts across the state. A fall 2016 survey of more than 200 California districts revealed that 75% of districts were experiencing teacher shortages, and the vast majority said those shortages were getting worse.[1] Most of those districts reported responding to shortage conditions by hiring teachers with substandard credentials or permits—that is, teachers who have not yet completed the subject matter and teacher preparation requirements for a full credential (see sidebar on page 3).

In this update, we show that, consistent with school district survey data, teacher workforce trends have worsened in the past year, with especially severe consequences in special education, math, and science, and significant threats in bilingual education:

- **Stagnant teacher supply is insufficient to meet growing teacher demand.** New California credentials have remained constant at 11,500 since 2013–14, while projected annual new hires have grown and now exceed 20,000.
- **There have been significant increases in substandard credentials and permits.** In 2015–16, California issued more than 10,000 intern credentials, permits, and waivers, more than double the number issued in 2012–13. These authorizations to teach were granted to those who had not completed—or sometimes not even started—preparation for teaching. The greatest growth has been in emergency-style permits known as Provisional Intern Permits (PIPs) and Short-Term Staff Permits (STSPs). **In 2015–16, California had over 4,000 teachers on PIPs and STSPs, nearly five times as many as in 2012–13.** About 1,700 PIPs and STSPs were issued in special education and more than 450 in math and science.
- **Enrollment in teacher preparation remains near historic lows.** Despite a 10% increase in teacher preparation enrollments between 2013–14 and 2014–15, the number of teaching candidates enrolled in 2014–15 was just one quarter of the number enrolled in 2001–02.
- **The pipeline of prepared math and science teachers continues to shrink.** Between 2012 and 2016, the proportion of math and science teachers entering the field on substandard credentials or permits doubled, going from 20% to nearly 40%, while the number of such teachers entering with full credentials dropped from 3,200 to only 2,200 over that time frame.
- **More special education teachers are entering the classroom on substandard credentials or permits than are entering with full teaching credentials.** Just 36% of new special education teachers in 2015–16 had a preliminary credential. The remaining authorizations issued to new special education teachers—more than 4,000, comprising 64% of the total—were for intern credentials or short-term permits or waivers. No other major teaching field issues most of its new credentials to underprepared candidates.

- **California may be unprepared to meet the expected increase in demand for bilingual education teachers as schools develop and expand bilingual programs under Proposition 58.** At 700 new bilingual teachers in 2015–16, California authorizes fewer than half the number of new bilingual teachers it did when bilingual education was hiring at its peak in the mid-1990s.
- **Shortages disproportionately impact low-income and minority students.** Teachers hired on emergency-style credentials are twice as likely to teach in high-poverty schools than in low-poverty schools and three times more likely to teach in high-minority schools than in low-minority schools.

Recent investments in the California state budget hold promise for bolstering the teacher workforce within the next 5 to 7 years but will not lessen the shortages occurring now. To address the shortfalls, more immediate solutions would be needed. To strengthen the teacher supply pipeline, California could:

1. **Offer service scholarships or loan forgiveness programs that cover the cost of tuition and living expenses to teacher candidates who commit to teach in high-need fields and locations.** Service scholarship and loan forgiveness programs have a track record of recruiting and retaining qualified teachers in the places where they are most needed.
2. **Boost the supply of teachers entering shortage fields and locations through high-retention teacher preparation programs completed in 1 year at the postbaccalaureate level, such as teacher residency models.** These teachers could immediately fill vacancies in shortage fields with the training and incentives to have successful and lasting careers.
3. **Eliminate barriers to re-entry for retired teachers in shortage fields, or postpone their exit.** Retired teachers are an untapped resource that can help meet immediate hiring needs. In the short term, the state could remove caps on earnings that would allow districts to hire retirees to return to schools as teachers and mentors. If employees pay into the retirement system, this would be revenue neutral. The state could also use a Deferred Retirement Option Program to keep experienced teachers in shortage fields.

Introduction

> The teacher shortage is something I'm living and breathing. At my own school—which has a positive school climate and where the data look good—I have five newly hatched teachers. And I had to employ some cutthroat tactics to ensure I opened fully staffed.
>
> — California school board member and elementary school principal

One year ago, in January 2016, the Learning Policy Institute examined growing teacher shortages in California, finding that they had rapidly reached critical proportions by the time districts began hiring again as the economy improved after the Great Recession.[2] A fall 2016 survey of over 200 representative California districts found that three out of four were facing teacher shortages, and most respondents said those shortages were worsening.[3] This trend is troubling because of the serious impact shortages have on students. According to the survey results, 55% of districts reporting shortages turned to teachers with substandard credentials or permits to fill vacant positions. Districts also reported hiring substitute teachers, assigning teachers to positions outside of their credential fields, leaving positions vacant, increasing class sizes, and canceling courses to manage vacancies, all of which impact student learning.

This report highlights the most recent data on California teacher workforce trends, based on data from California government sources. In short, we find that teacher demand continues to grow, but teacher supply is stagnant. Shortages are particularly acute in special education, math, and science, and in schools serving students of color, low-income students, and English Learners (ELs). We anticipate there will be an increasing need for bilingual education teachers due to the passage of Proposition 58 in the fall of 2016, which permits California districts to reinstate bilingual education programs. This report examines policy strategies for increasing teacher supply in all of these areas and in the locations where shortages are most severe.

California Teacher Credential and Permit Types

Fully prepared teachers/Teachers with full credentials

Preliminary credentials are awarded to individuals who have successfully completed a teacher preparation program and the state assessments required for a license, including demonstration of subject matter competency and teaching skills. These credentials are valid for five years.

Clear credentials are awarded to preliminary credential holders once they have successfully completed an induction program. These credentials are renewable every 5 years.

Underprepared teachers/Teachers with substandard credentials and permits

Provisional Intern Permits (PIPs), Short-Term Staff Permits (STSPs), and Waivers are used to fill "immediate and acute" staffing needs. These emergency-style, one-year permits allow individuals who have not completed teacher preparation programs nor demonstrated subject matter competence to teach a particular grade or course for a maximum of 1 year.

Limited Assignment Teaching Permits allow credentialed teachers to teach outside of their subject area to fill a "staffing vacancy or need."

Intern credentials are awarded to teachers in training who have demonstrated subject matter competency but who have not completed a teacher preparation program or met the performance assessment requirements for a license. Interns take courses and receive mentoring while teaching.

Source: California Commission on Teacher Credentialing, CTC Glossary: http://www.ctc.ca.gov/reports/data/files/data-terms-glossary.pdf. See also http://www.ctc.ca.gov/credentials/leaflets/cl856.pdf, http://www.ctc.ca.gov/credentials/leaflets/cl858.pdf; http://www.ctc.ca.gov/credentials/leaflets/cl402a.pdf.

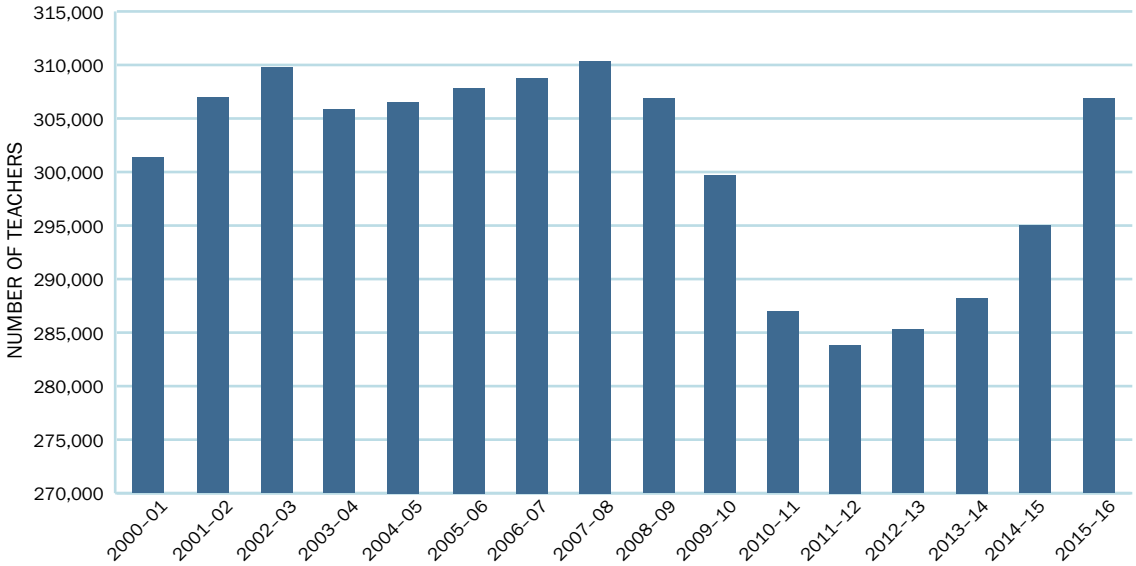
Trends in the California Teacher Workforce

Teacher Demand Is Growing

In the decade leading up to the Great Recession, the California teacher workforce held relatively steady at between 300,000 and 310,000 teachers annually. Following budget deficits in the years of the recession, California lost 25,000 teaching positions between 2008 and 2012 to layoffs and attrition. However, as the economy has rebounded, so has the demand for teachers, as districts attempt to return class sizes and program offerings to pre-recession levels. The most recently available data show that the size of the teacher workforce in 2015–16 matched that in 2008–09, an 8% increase over the 2011–12 workforce low (see Figure 1).

Figure 1
The Teacher Workforce Continues to Grow

Number of California public school teachers, 2000–01 to 2015–16



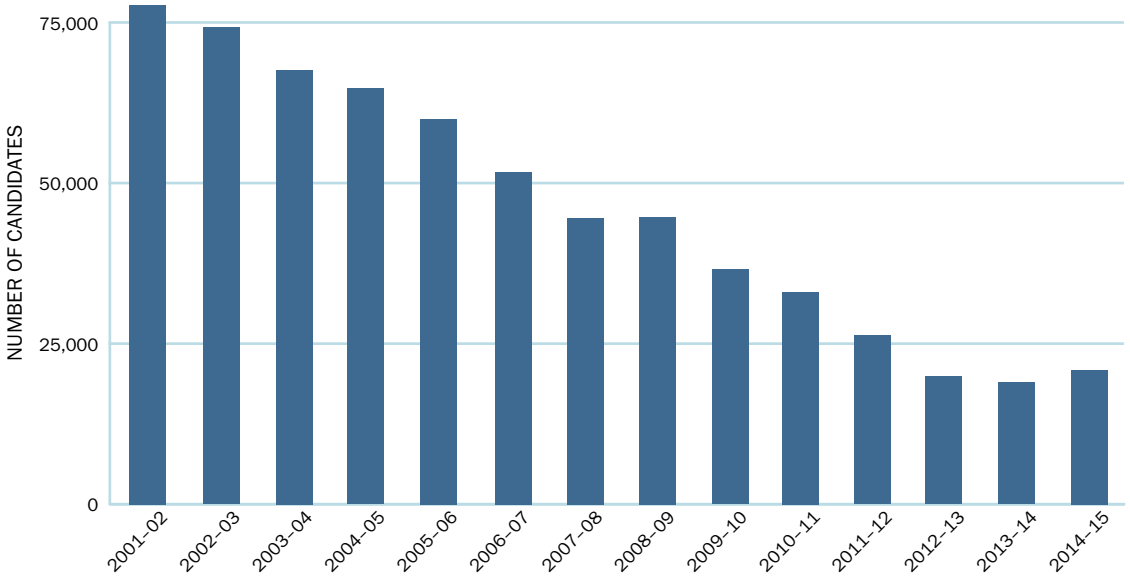
Source: California Department of Education, 2000–2015. 2015–16 data are preliminary. Data available on DataQuest web page at http://data1.cde.ca.gov/dataquest/.

The Teacher Supply Pipeline Is Diminished

Enrollment in teacher preparation programs has steadily declined from a high of 77,705 candidates in 2001–02 to 18,984 in 2013–14 (see Figure 2). Evidence from 2014–15 shows a modest uptick in enrollments, with 20,881 candidates enrolled. This increase from the previous year could suggest that prospective candidates are responding to the shortage and could portend growing enrollments in coming years. Still, the number of candidates enrolled in 2014–15 was just a quarter of the number enrolled in 2001–02 and not enough to meet current demand.

Figure 2
Enrollment in Teacher Preparation Remains Low

Number of candidates in California enrolled in teacher preparation programs, 2001–02 to 2014–15



Source: California Commission on Teacher Credentialing. Data available at http://www.ctc.ca.gov/reports/data/titleII-prog-info.html.

The University of California (UC) and California State University (CSU) systems typically prepare about 60% of new teachers in California, with CSU accounting for about 50% and UC preparing less than 10%.[4] Both systems have noted growing enrollments in their teacher preparation programs after hitting low points in 2013–14. CSU saw a 1-year increase of about 800 candidates in 2015–16, while UC enrollments increased by fewer than 50 candidates (see Table 1). Both systems remain far below the enrollment levels of a decade ago. At its highest point, in 2002–03, CSU alone enrolled over 31,000 teaching candidates.[5]

Table 1
Teacher Preparation Enrollments in the State University System

Institution	2011–12	2012–13	2013–14	2014–15	2015–16
California State University	9,496	8,052	8,642	8,837	9,660
University of California	1,055	788	726	883	928
Total	**10,551**	**9,840**	**9,368**	**9,720**	**10,588**

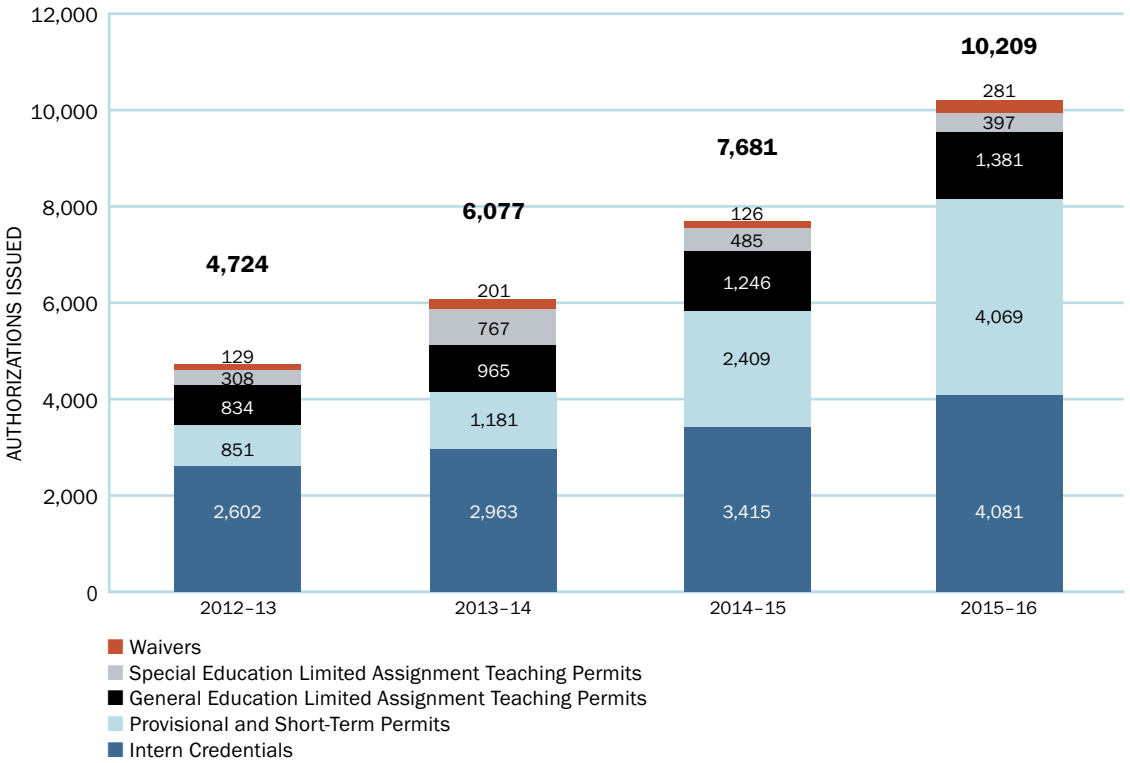
Source: Data from the California State University Office of the Chancellor and the University of California Office of the President, provided by LPI request.

Other data suggest that these small increases have been inadequate to meet demand and, as we discuss later, they have not been in the fields where the shortages are the most severe. Substandard permits and credentials increased by more than 2,500 in 2015–16, nearly three times as much as CSU and UC increases in teacher preparation enrollments combined (see Figure 3).

Substandard permits and credentials increased by more than 2,500 in 2015–16, nearly three times as much as CSU and UC increases in teacher preparation enrollments combined.

It should be noted that teacher preparation enrollment figures may overstate the number of new teachers entering the field. Not all candidates who enroll in teacher preparation programs go on to complete them, and even those who do may not join the teacher workforce. In 2014–15, about 10,600 candidates completed programs, a 25% decline over the previous 5 years and consistent with declines in enrollments.[6] Of those completers, national research suggests that between 75% and 90% go on to teach within 4 years.[7] In addition, even among program completers who do join the workforce, many will not teach in the fields and locations where the need is greatest.

Figure 3
Substandard Credentials and Permits Doubled Between 2012–13 and 2015–16



Note: Number of substandard credentials and permits issued between July 1 of each year and June 30 of the following year.
Source: Data provided by the California Commission on Teacher Credentialing by request.

Substandard Credentials and Permits Have Increased Significantly

Perhaps the best indicator of shortages is the issuance of substandard credentials or permits, which by law are not supposed to be issued unless fully qualified candidates are not available. Between 2012–13 and 2015–16, there was a substantial increase in the number of teachers entering the field on substandard credentials and permits—that is, without having completed teacher preparation or other state credentialing requirements for a preliminary teaching credential. In 2015–16, more than 10,000 intern credentials, permits, or waivers were granted, more than double the number of such permits issued just 3 years earlier, in 2012–13 (see Figure 3). The greatest increases in substandard credentials and permits between 2012 and 2015 have been in emergency-style provisional and short-term permits, which have nearly quintupled, and waivers, which have more than doubled.

Of all substandard authorizations, PIPS, STSPs, and waivers require the least teaching preparation and are growing at the fastest rates, more than tripling since 2013 and comprising the largest share of substandard authorizations. These emergency-style permits are issued to fill "acute staffing needs" and do not require teachers to have demonstrated competency in the subjects they will teach or to have enrolled in teacher preparation programs. Intern credentials, which require teachers to have demonstrated subject matter competency and to be enrolled in a teacher preparation program, have increased at a slower pace, growing by less than 60% since 2012–13. Meanwhile, the number of credentials issued to fully prepared teachers continued to decrease over the same period (see Figure 4).

> Evidence shows that underprepared, out-of-field, and substitute teachers typically depress student achievement and have higher attrition rates.

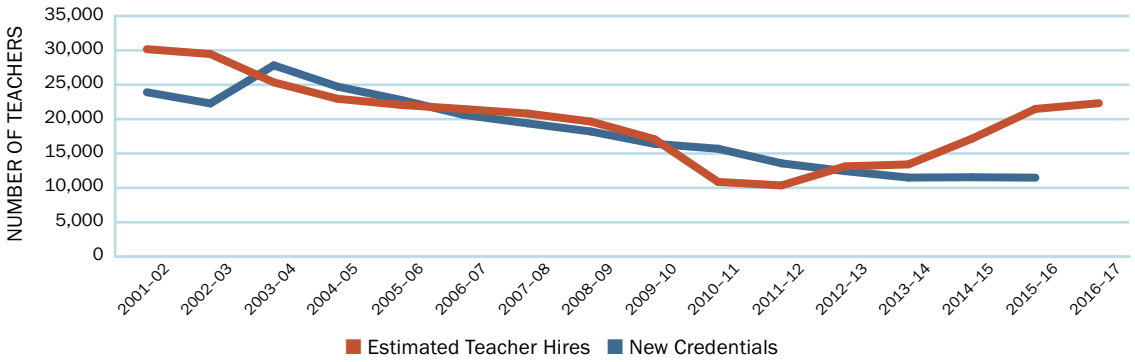
Districts certainly cannot leave all of their unfilled positions empty. Survey data suggest that, in addition to hiring underprepared teachers, they are hiring substitutes, who need only pass a basic skills test, and assigning some teachers out of their fields of preparation.[8] Relying on underprepared, out-of-field, and substitute teachers is a cause for concern. Evidence shows that these teachers typically depress student achievement and have higher attrition rates.[9] According to a 2014 study drawing on a nationally representative sample of teachers, those who entered the profession with little to no pedagogical training were 2.5 times more likely to leave teaching after their first year than were well-prepared teachers. Well-prepared teachers in this study were those who entered the profession with comprehensive preparation, including at least a full semester of practice teaching with feedback, observation of other teachers, and extensive coursework in learning theory and teaching methods. The likelihood of staying in the profession held whether teachers were well prepared through a traditional or alternative certification pathway. Meanwhile, the high attrition rates of underprepared teachers create continuous demand for new teachers and exacerbate shortages.[10]

Shortage Predictions Intensify as Teacher Demand Increases and Teacher Supply Stagnates

Between 2013–14 and 2015–16, California preliminary credentials issued by the Commission on Teacher Credentialing stagnated at about 11,500 each year (see Figure 4). Meanwhile, district-estimated teacher hires continued to grow, exceeding 22,300 estimated hires in 2016–17. Even with the additional 3,800 teachers prepared out of state who were credentialed in 2015–16, and the unknown number of already credentialed teachers who may have re-entered the profession after stepping out for a period of time, teacher demand far outpaced teacher supply.[11]

Figure 4
Teacher Demand Continues to Grow

New preliminary teaching credentials issued and district-estimated new hires, 1999–2000 to 2016–17



Note: The 2015–16 credential data represent preliminary credentials issued to new California-prepared teachers who have met all initial credential requirements.

Source: Data on estimated teacher hires are from the California Department of Education. Data on new credentials are from the California Commission on Teacher Credentialing.

Subject Area Shortages

Special Education Substandard Credentials and Permits Are Growing at an Alarming Rate

> I was speaking with an attorney this week, and he is saying that districts are getting so desperate to find special ed teachers, they have started calling his law firm to say, "Do you know of any districts that have a teacher that is being non-re-elected, that is not doing bad things to kids, but just needs work on their instruction that we can pick up?" They are calling law firms to find teachers.
>
> —County personnel administrator

California schools have had persistent difficulties filling special education vacancies, but in the past 2 years these shortages have skyrocketed, as evidenced by the growth of substandard special education certifications. The most dramatic increases in interns, permits, and waivers have been in the field of special education, where the numbers have nearly doubled between 2011–12 and 2015–16 (see Figure 5). In that same time, however, the number of preliminary special education credentials issued to fully prepared teachers has actually fallen by 29%.

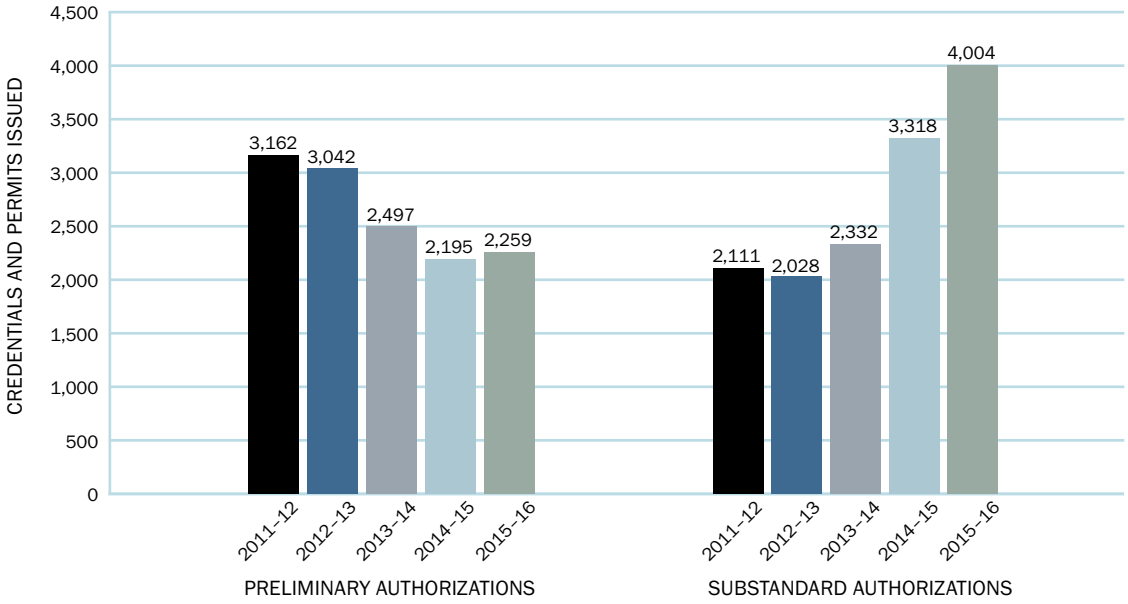
Although the annual pool of new special education teachers has increased by nearly 30% over the past 2 years, these increases are being driven entirely by teachers with substandard authorizations. The increase in the annual hiring of these teachers likely reflects a high attrition rate for special education teachers, since the number of special education students has not been increasing appreciably. With an aging teacher workforce and fewer qualified new special education teachers, special education shortages may become even worse in future years. Researchers project that more than a quarter of California's special education teachers teaching in 2014 will retire by 2024 (in some counties, up to 86.5% may retire), more than in any other subject area.[12]

Teacher preparation is important for all students, but it is even more critical to the success of children with special needs. Research has found that special education training significantly improves teachers' capacity to effectively teach students with special needs.[13] Special education teachers with more extensive pedagogical training and practice teaching are better prepared to handle key teaching duties, such as planning lessons, managing the classroom environment, fulfilling professional duties, and using a variety of instructional methods.[14] Those teachers who are not prepared to meet the needs of their students struggle to manage the classroom and may inadvertently elicit challenging behaviors from students that lead to classroom disruption, restraint and seclusion, and other outcomes that negatively impact student learning and well-being.[15] In addition, shortages in special education are most likely to disproportionately affect English Learners, who are overrepresented in special education by nearly 30%, and Black students, who are overrepresented in special education by nearly 50%.[16]

Research has found that special education training significantly improves teachers' capacity to effectively teach students with special needs.

Figure 5
Trends in Special Education Teacher Supply

Preliminary and substandard authorizations issued, 2011–12 to 2015–16

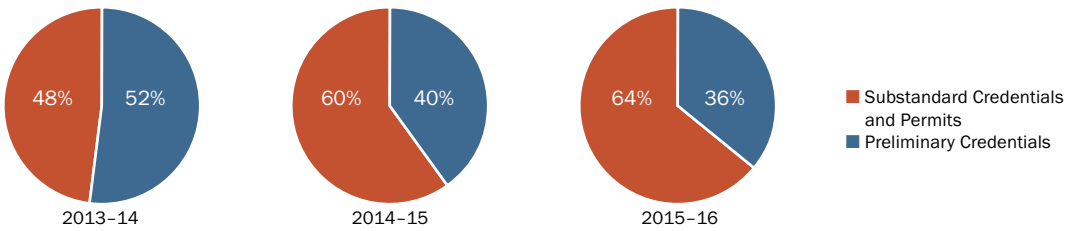


Source: California Commission on Teacher Credentialing.

In 2013–14, just under half of new special education teachers held substandard authorizations (interns, permits, or waivers) (see Figure 6). By comparison, in the same year interns, permits, and waivers comprised about a quarter of new math and science teachers, another critical shortage field (see next section). In the past 2 years the proportion of underprepared new special education teachers has grown substantially. In 2014–15, 60% of new special education teachers held substandard authorizations, and by 2015–16, nearly two thirds (64%) held substandard authorizations. In no other major teaching field do interns, permits, and waivers make up a majority of new teachers.

Figure 6
New, Underprepared Special Education Teachers Outnumber Those Who Are Fully Prepared 2:1

Proportion of preliminary and substandard special education authorizations issued, 2013–14 to 2015–16

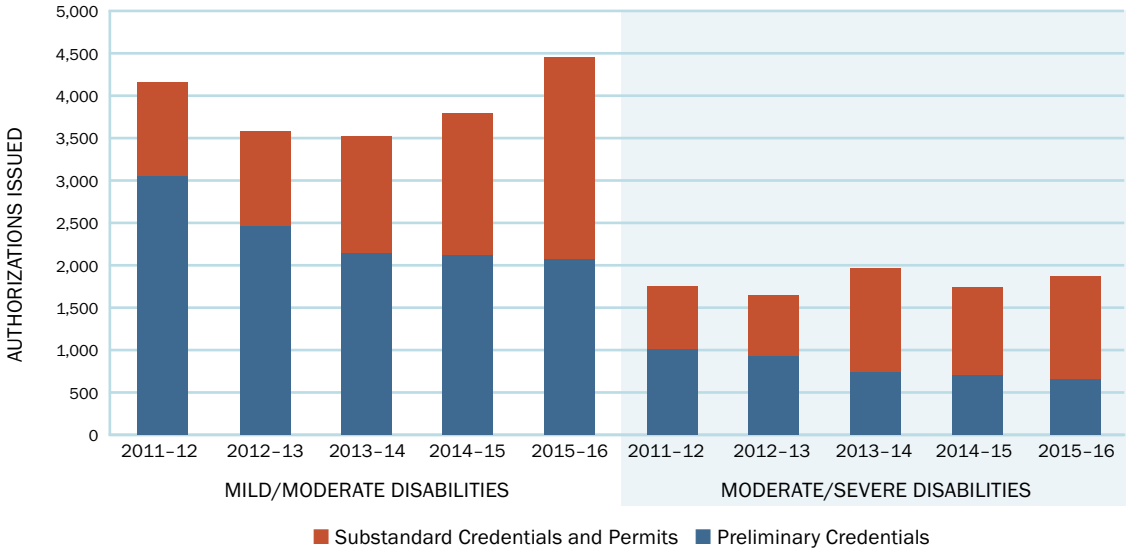


Source: California Commission on Teacher Credentialing.

Among new special education teachers, underprepared entrants outnumber fully prepared entrants in nearly every special education subspecialty. Special education subspecialties include early childhood, visual impairments, physical and health impairments, deaf and hard of hearing, mild/moderate disabilities, and moderate/severe disabilities. In every subspecialty, a greater proportion of new teachers held substandard authorizations in 2015–16 than did in 2011–12.

In other words, special education shortage conditions have been getting worse over time and across the board. The greatest increases in the proportion of substandard authorizations have been in mild/moderate disability authorizations, which have more than doubled since 2011–12, and moderate/severe disability authorizations, which have increased more than 60% (see Figure 7.) These types of special education credentials are needed to teach students with complex learning needs, including students diagnosed with autism, intellectual disabilities, and serious emotional disturbance.[17]

Figure 7
Special Education Subspecialty Authorizations, 2011–12 to 2015–16



Source: Data provided by the California Commission on Teacher Credentialing by request.

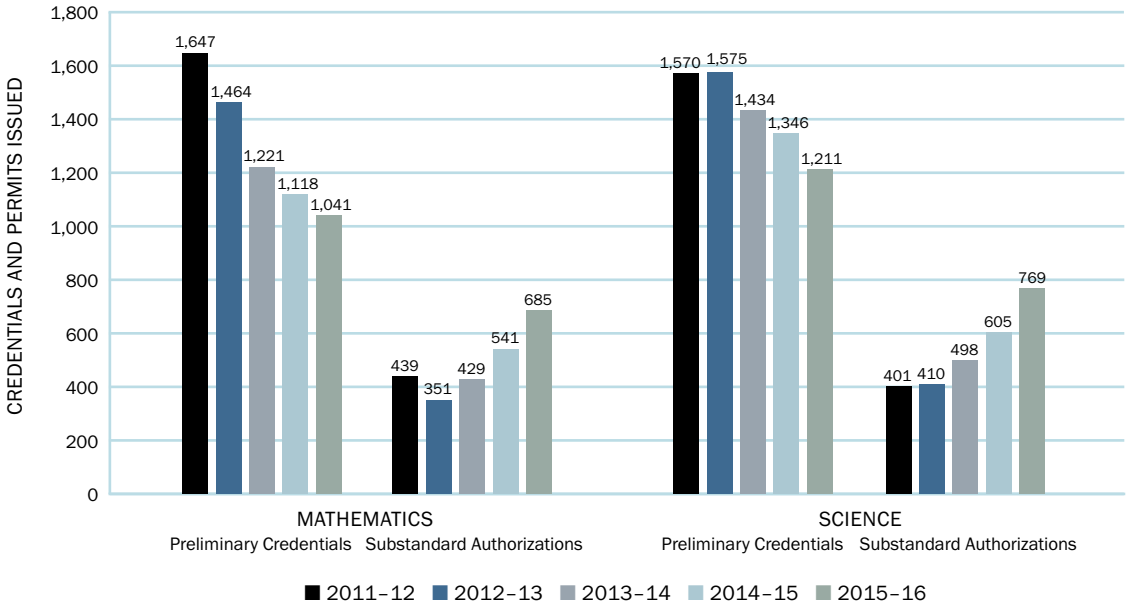
The Pipeline of Fully Prepared Math and Science Teachers Continues to Shrink

Between 2011–12 and 2015–16, the proportion of new math and science teachers entering teaching on substandard credentials and permits doubled, from about 20% to 40% of the total (see Figure 8). The implementation of more challenging Common Core State Standards and Next Generation Science Standards makes it even more important that math and science teachers have both the content knowledge and the teaching expertise to help students develop higher-order thinking skills and subject matter proficiency. Our analysis shows, however, that despite the growing teacher workforce, the pipeline of prepared math and science teachers is shrinking; fewer math and science teachers are entering the profession each year, and a larger share of those entering are underprepared. The number of new teachers entering the field with preliminary credentials

dropped from 3,200 to 2,200 between 2012 and 2016. While the total number of math and science teacher vacancies posted on EDJOIN, the statewide educator job portal, held steady between 2015 and 2016, far more of those postings were still listed as the school year was underway in mid-October 2016 than in mid-October 2015. In addition, mid-October science vacancies were up by a third in 2016 compared to the same time in 2015.[18]

> Fewer math and science teachers are entering the profession each year, and a larger share of those entering are underprepared.

Figure 8
Trends in Mathematics and Science Teacher Supply
Preliminary and substandard authorizations issued, 2011–12 to 2015–16



Source: California Commission on Teacher Credentialing.

California May Be Unprepared to Meet the Expected Increase in Demand for Bilingual Teachers

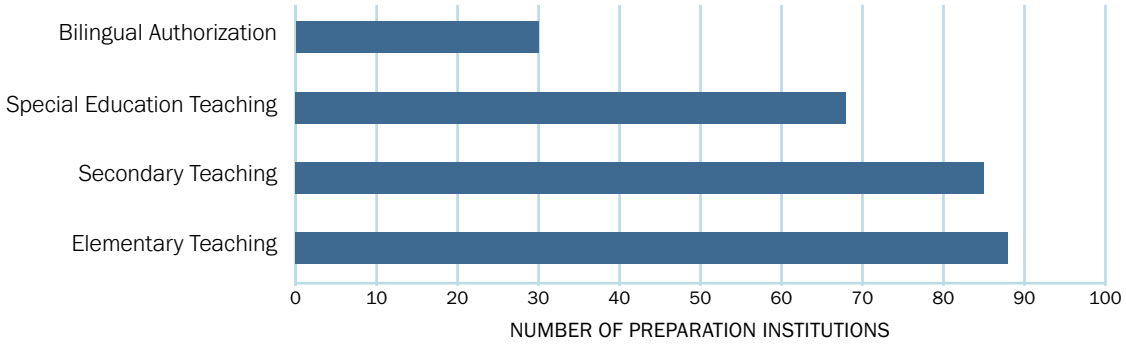
The passage of Proposition 58 in November 2016 removes restrictions on bilingual education programs for California's English Learner students, allowing California school districts to more easily create or expand bilingual and immersion programs. Proposition 58 amends and removes key components of Proposition 227, which when passed in 1998 severely limited the extent to which schools could offer bilingual education. Now, schools and families have greater latitude to seek bilingual education, which will likely lead to increased demand for teachers with bilingual authorizations. Bilingual education teachers must be fluent in both English and the second language of instruction, as well as pedagogically skilled to support language acquisition and academic content mastery. Teacher shortages pose a unique challenge in this context. As districts and schools attempt to create or expand bilingual programs, they will have to vie for an already limited supply of fully prepared teachers, in addition to recruiting teachers with bilingual authorizations.

There are 1.4 million English Learners in California, making about one in five students an English Learner.[19] Before the passage of Proposition 227, about 30% of ELs were served by bilingual programs. A decade later, the proportion of EL students served by bilingual programs decreased to just 5%.[20] As a result, the number of bilingual teacher preparation programs was greatly reduced across the state.[21] In 2009, the Commission on Teacher Credentialing approved a set of standards that would allow teachers to pursue bilingual authorization through multiple routes, with both coursework and examination options, likely contributing to a greater share of bilingual authorizations being issued to existing teaching credentials than to new teaching credentials.[22] Currently, only 30 teacher preparation institutions offer bilingual authorization training programs, compared to more than 80 that grant secondary and elementary teaching certifications (see Figure 9).[23]

At its peak in 1994–95, California granted over 1,800 bilingual authorizations (see Figure 10). Even after the passage of Proposition 227, California issued over 1,200 bilingual authorizations a year between 2003–04 and 2009–10. Since 2010, new bilingual authorizations have declined steadily, with fewer than 700 teachers authorized in 2015–16. Of the more than 200 representative California school districts surveyed in fall 2016, before Proposition 58 was passed, 14% reported shortages of bilingual teachers.[24]

Figure 9
Few California Institutions Offer Bilingual Teacher Training

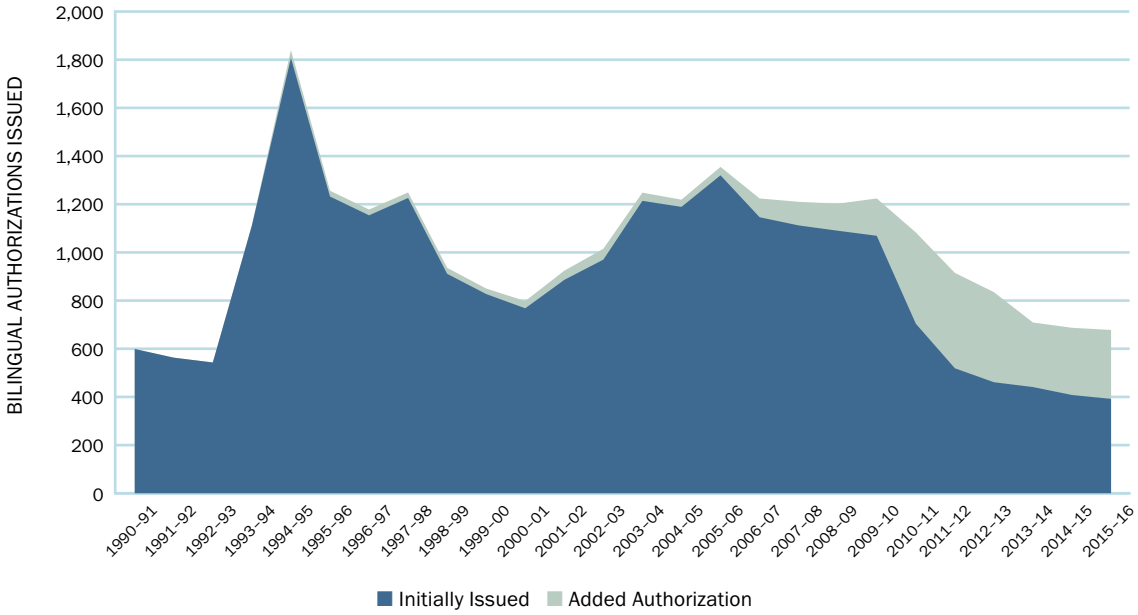
Institutions with state-approved, active educator preparation programs



Source: California Commission on Teacher Credentialing. Data available at http://www.ctc.ca.gov/reports/data/app-edu-prep-prog.html.

Research shows that ELs in well-implemented bilingual programs outperform ELs in English immersion programs in every subject by middle or high school and are more likely to achieve at or above grade level.[25] A review of the research on bilingual education shows that bilingual students also experience cognitive, social, and economic advantages.[26] They have better focus, memory, and problem-solving skills, a better sense of self, better relationships with their parents, and are more likely to graduate high school and go to college than their monolingual peers. However, as California learned in its earlier experience with bilingual programs, successful program models require well-prepared teachers, and teacher shortages can undermine the programs' effectiveness.

Figure 10
Bilingual Authorizations Issued 1990–91 to 2015–16



Note: Initially issued bilingual authorizations are those issued on a new teaching credential. Added authorizations are those that have been issued on an existing credential.

Source: Data provided by the California Commission on Teacher Credentialing by request.

Shortages Disproportionately Impact Low-Income, English Learner, and Minority Students

According to California's 2016 State Plan to Ensure Equitable Access to Excellent Educators, teachers in the state's high-minority schools are nearly three times as likely to be teaching on an emergency-style credential than teachers in a low-minority school.[27] In high-poverty schools, such credentials are twice as common as in low-poverty schools. There is a similar trend in the distribution of teachers hired on intern credentials. Districts also report shortages in schools serving ELs. According to survey data, of districts serving the most ELs, 83% report having shortages compared to 64% of districts with the fewest ELs.[28]

Recent Legislation

California's $35 Million Investment Is a Down Payment Toward Eliminating Teacher Shortages

After several bills were introduced in the California State Legislature in 2015–16, the 2016–17 California State Budget included $35 million in funds for programs aimed at curbing teacher shortages.[29]

1. **California Center on Teaching Careers:** The state budget included $5 million to create the California Center on Teaching Careers, which is charged with recruiting new teacher candidates by providing information and resources on teacher preparation, credentialing, and employment via a significant online presence and six regional centers across the state. The California Commission on Teacher Credentialing (CTC) awarded the 3-year grant to the Tulare County Office of Education, which is expected to begin operating in early 2017.[30]

2. **Integrated Teacher Preparation Program Grant:** The budget included $10 million for grants to institutions of higher education to develop or expand 4-year integrated teacher preparation programs. These integrated programs allow undergraduates to earn a bachelor's degree and teaching credential in 4 years, in contrast to the more widespread fifth-year, postbaccalaureate pathway to a credential in California. These programs will allow candidates to enter the classroom sooner in their educational process and with less student debt. The CTC has identified 34 grant recipients, prioritizing program proposals designed to produce teachers specializing in special education, math, science, or bilingual education and those that will develop integrated programs in partnership with community colleges.[31]

3. **California Classified School Employee Teacher Credentialing Program:** The 2016–17 budget rebooted California's successful Paraprofessional Teacher Training Program, allocating $20 million for grants to school districts, county offices of education, and charter schools to recruit classified school staff to become certified teachers.[32] Grants fund tuition and other costs at $4,000 per candidate per year for up to 5 years ($20,000 maximum). The budget included funding for 1,000 classified staff to become teachers, and the CTC received grant applications seeking funding to train 5,582 classified employees.[33]

The expected benefits these investments will yield are more than 5 years away, as programs still need to be designed and launched, undergraduates must complete 4-year teacher preparation programs, and classified staff must complete at least 4–5 years of postsecondary education to earn a B.A. and teaching credentials. Furthermore, supply is not increasing in the fields with the greatest shortages as a result of the small uptick in teacher education enrollments. Hence, to address the shortages in the short term, California will need targeted initiatives that can more quickly expand the pipeline of highly needed teachers to supplement the longer-term strategies.

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Policy Recommendations

In the past year, California's teacher shortage has worsened as teacher demand grows and teacher supply stagnates. As a result, districts are having to hire a growing number of teachers on substandard permits and credentials, which are increasing more quickly than are preliminary credentials.

Fortunately, recent California legislation demonstrates a concern for addressing the worsening teacher shortages across the state. However, as discussed above, **benefits from the most recent budget investments will not be apparent for 5 years or more, with students in the meantime suffering the consequences of ongoing shortages**. The state's goals for high-quality education will be undermined if it continues to supplement an inadequate teacher supply with underprepared teachers who leave at high rates (two to three times greater than prepared teachers), thereby provoking greater churn in high-need schools and depressing student achievement.[34]

The state has a singular role in this effort, which is to build the teacher supply pipeline—something that districts cannot do by themselves. While districts can entice teachers in a variety of ways, unless the supply is adequate, successful districts ultimately poach teachers from other districts around the state. In doing so, **well-resourced districts and schools often shift teachers away from under-resourced districts and schools, and our most vulnerable students bear the brunt of teacher shortages.** As a school board member in a well-resourced district explained: "We are in a better position, but that is because we are an excess property tax district and over the last 3 years have increased salaries by 20%."[35]

Most school districts are not in a position to compete with a district such as this one when there is a limited supply of fully prepared teachers. **If the state, however, can increase the total supply of teachers in high-demand fields, all schools and students could be better off.** Given the immediate pressing need, state efforts might focus in part on incentives to attract individuals to train in key fields, such as in 1-year postbaccalaureate programs with a service requirement that keeps them in classrooms where they are needed.

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The following recommendations address how the state can boost teacher supply quickly without compromising on teacher quality. Given the urgent need to eliminate teacher shortages for today's students, the state could consider the following short term strategies:

1. **Offer service scholarships or loan forgiveness that cover the cost of tuition and living expenses to teacher candidates who prepare and commit to teach in high-need fields and locations.**

   Service scholarships and loan forgiveness programs have been found to be effective at attracting teachers into high-need schools and hard-to-staff positions.[36] Well-designed service scholarship and loan forgiveness programs can draw prospective teachers into the profession by lowering the debt burden of college and teacher preparation, especially given

modest teacher salaries. Research shows that student debt has a powerful influence on whether college students choose to pursue a career in education; this is especially true for college students of color and those from low-income households.[37]

In addition, combining solid, comprehensive preparation with a service requirement keeps candidates in teaching longer. Since attrition feeds demand, reducing teacher attrition can slow the growth of teacher demand and thereby reduce future shortages. For example, recruits from the North Carolina Teaching Fellows service scholarship program had higher retention rates than did other in-state prepared teachers, and proved to be more effective as well.[38]

2. **Boost the supply of teachers entering shortage fields and locations through high-retention teacher preparation programs completed in 1 year at the postbaccalaureate level, such as teacher residency models. These teachers can immediately fill vacancies with the training to have successful and lasting careers.**

Teacher residencies are rigorous teacher preparation programs modeled on medical residencies; they offer an accelerated path to teacher certification through district-university partnerships that ensure high-quality pedagogical training and clinical practice. Residents receive funding for tuition and living expenses, plus a stipend or a salary, while they apprentice with a master teacher in a high-need classroom for an entire school year and take related courses that earn them a credential and a master's degree. They repay this investment by committing to teach in a hard-to-staff position in the sponsoring district for at least 3 to 4 years after their residency year while they receive additional mentoring. Urban districts or consortia of rural districts with nearby universities often sponsor these programs.

Research on the impact of the residency model suggests that, on average, residents are more racially diverse than new teachers; are much more likely to stay in teaching, especially in the high-need districts that sponsor them; and are typically more effective than other novice teachers.[39] The San Francisco Teacher Residency (SFTR) program is a prime example. The program focuses on math, science, and bilingual education; two-thirds of residents are people of color, compared to 49% of all San Francisco Unified School District (SFUSD) teachers. After 5 years, 80% of graduates still taught in SFUSD, compared to 38% of beginning teachers hired by SFUSD through other pathways. An impressive 100% of principals report that SFTR graduates are more effective teachers than nonresident novice teachers.[40]

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Residencies currently operate in 10 rural and urban communities in California.[41] The state could encourage their expansion with a competitive grants program in which the state, perhaps in partnership with private funders, matches local investments to stimulate programs to reach more high-need communities.

3. **Eliminate barriers to re-entry for retired teachers in shortage fields, or postpone their exit.**

Retired teachers are an untapped resource that can help meet immediate hiring needs without the considerable cost and delay of pre-service preparation. More experienced teachers could be a boon to many schools, since evidence shows that teachers, on average, continue to improve student outcomes with each year of experience, including into the second and third decades of their careers.[42]

Already, retired teachers are taking advantage of opportunities to re-enter the workforce. Data from the California State Teachers' Retirement System (CalSTRS) show that in 2016 there was a marked increase in the number of retirees applying for separation-from-service requirement exemptions. This exemption allows retirees to return to schools within 180 days of retiring if they meet several criteria, including filling a critically needed position. In 2013, CalSTRS received just 13 of these exemption applications, which are submitted by employers.[43] In 2016, they received 88, nearly seven times as many applications as they did in 2013. Between 75% and 90% of these applications are approved by CalSTRS each year. This growth in separation-from-service exemptions suggests both that retired teachers are willing to return to the classroom soon after retirement, and districts are interested in hiring retired teachers to fill positions.

There are currently barriers to tapping this source of teachers, however. In addition to the 180-day separation-from-service requirement, state law currently includes an earnings cap. In 2016–17, retired teachers were capped at earning $41,732 annually if they were to return to service in a California public school. There is no cap on earnings, though, if retirees choose to teach in private schools, public schools outside of California, or in other work outside of public schools.[44] California's average teacher salary is about $70,000, so most retired teachers would exceed the earnings limit by returning to the classroom.[45] For every dollar they exceed the earnings limit, a dollar is withheld from their retirement earnings.

Earnings limit exemptions already exist for a select few. Until June 30, 2017, retirees appointed by a state or county superintendent, the State Board of Education, or the Board of Governors of the California Community Colleges to work as a trustee, fiscal expert or advisor, receiver, or special trustee in schools experiencing financial or academic challenges may be exempt from the earnings limit. Broader exemptions have also existed in the past. Between 2001 and 2012, some retirees could apply for an exemption if they taught k-12, provided mentorship to new teachers and student teachers, or taught special education or EL education.[46] State policymakers could consider authorizing a similar earnings limit exemption that allows retirees to return to the classroom to fill critical vacancies in high-need fields and hard-to-staff classrooms.

State policymakers could consider piloting a similar earnings limit exemption that allows retirees to return to the classroom to fill critical vacancies in high-need fields and hard-to-staff classrooms.

Such a pilot could be structured to be cost neutral, if teachers pay into the retirement system while they are working. Meanwhile, it would allow schools to fill shortage positions with experienced teachers without the expense of costlier solutions.

Another way to reduce barriers to re-entry for retired teachers and to fill critical shortage positions is the Deferred Retirement Option Program (DROP) approach to pension plans, being used for teachers in states such as Louisiana and Florida and for public sector employees in many other states.[47] A DROP, which can be designed to be revenue neutral, allows employers to retain long-term, experienced employees who serve critical needs beyond normal retirement eligibility while also attaining some certainty as to when they will retire. The employee can "freeze" his or her service credits and final average salary as of the DROP election date for retirement calculation purposes. The member elects to have the retirement allowance that would have been paid (if the member had retired) credited to a DROP account while he or she continues to work and draw a salary from the employer.

A third way to retain late career teachers is to offer targeted retention bonuses to senior teachers who are rated as effective and who are teaching in high-need fields.[48]

The strategies suggested in these recommendations can be targeted to the key shortage fields and locations where the need is most acute. In this way, districts can bolster their teacher workforce while other state investments take hold. Our recommendations focus on the immediate need to increase the supply of well-prepared teachers in the state, but long-term success will require a comprehensive set of policies that takes into account the many factors that create shortages, including high rates of teacher attrition.[49]

An influx of new teachers will not last long in the profession if they do not also encounter supportive mentors and school leaders, as well as good working conditions. In addition to important state recruitment actions, **districts can undertake local initiatives, such as improving compensation, mentoring and support, hiring and personnel management practices, and working conditions** to more effectively recruit and retain teachers who are dedicated to the profession and prepared for success in the classroom.[50]

Conclusion

> Having gone through a teacher shortage in the mid-90s, I worry that we're going to be in that era again where we are desperate for a warm body, and that they're not given the proper training and setup to be successful. And who is affected by that is kids; and that's a huge worry to me.
>
> —California district superintendent

A common objection to teacher shortage interventions is the belief that the teacher labor market will adjust on its own to meet demand. It is true that teacher supply is dynamic, and adjusts as economic and social conditions change. As the demand for teachers increases, we can expect that districts will seek to improve salaries and working conditions and more individuals will take an interest in teaching, a change that will likely occur incrementally over the next few years.

Nonetheless, shortages are still a major problem. First, the promise of more teachers tomorrow does nothing to help students today. Even if we assume that teacher supply will adjust to meet growing demand, that change could be years into the future with a cost borne by students. Even if teacher preparation enrollments continue to grow, there is no guarantee that new candidates will enter the fields where they are most needed. Indeed, evidence suggests that special incentives will continue to be needed for certain high-need teaching fields and locations. Even high-paying states such as Massachusetts offer incentives to address shortages in special education, bilingual education, math, and science, despite having a statewide surplus of teachers in other fields.[51] Similarly, schools in urban and rural areas or with low-income, high-minority, and/or high-EL student populations may continue to struggle to find qualified teachers.

Even if we assume that teacher supply will adjust to meet growing demand, that change could be years into the future with a cost borne by students.

Faced with a similar challenge during a period of severe shortages more than 20 years ago, California responded by issuing emergency permits and waivers; by the year 2000, over 40,000 teachers were teaching with substandard authorizations, disproportionately assigned to high-minority, high-poverty schools.[52] However, the number of underprepared teachers decreased quickly as incentives introduced in the late 1990s began to take hold; the Assumption Program of Loans for Education loan forgiveness program, the Governor's fellowships, and Cal TEACH grants all helped to underwrite preparation with service requirements that recruited and distributed teachers to the places where they were most needed. Salary increases, investments in teacher mentoring, and the Teachers as a Priority program all contributed to sharp reductions in the number of underprepared teachers who were hired. However, these programs were eliminated over the subsequent decade, leaving the state unprepared for the emergence of a new round of shortages.

The most recent evidence shows that the pattern of many years ago may be repeating itself now; substandard credentials and permits are rapidly increasing, with students in special education, as well as those in high-minority, high-poverty, and high-EL schools hardest hit. There are thousands of students today in classrooms with teachers who are wholly unprepared. While the state has made initial investments in increasing the supply of well-prepared teachers, these investments

will take time to yield qualified teachers. More action is needed to ensure a robust, well-prepared teacher workforce now and into the future. Rather than filling more classrooms with underprepared teachers, the state could invest in rapidly building the supply of qualified teachers in the fields and locations where they are most needed, while creating incentives for experienced, effective teachers to re-enter and remain in the classroom.

Endnotes

1. Podolsky, A., & Sutcher, L. (2016). *California teacher shortages: A persistent problem*. Palo Alto, CA: Learning Policy Institute and California School Boards Association. The demographics of this sample are generally representative of the average district demographics in the state.
2. Darling-Hammond, L., Sutcher, L., Furger, R., & Shields, P. (2016). *Addressing California's emerging teacher shortage: An analysis of sources and solutions*. Palo Alto, CA: Learning Policy Institute.
3. Podolsky, A., & Sutcher, L. (2016). *California teacher shortages: A persistent problem*. Palo Alto, CA: Learning Policy Institute and California School Boards Association.
4. Suckow, M., & Roby, L. *Teacher supply in California, 2014–15: A Report to the Legislature.* Sacramento, CA: California Commission on Teacher Credentialing, April 2016. http://www.ctc.ca.gov/reports/TS-2014-2015-AnnualRpt.pdf (accessed 11/14/16).
5. Data provided by California State University Office of the Chancellor in response to LPI request.
6. Title II State Program Information. (n.d.). http://www.ctc.ca.gov/educator-prep/Title2.html (accessed 12/8/2016).
7. Sutcher, L., Darling-Hammond, L., & Carver-Thomas, D. (2016). *A coming crisis in teaching? Teacher supply, demand, and shortages in the U.S.* Palo Alto, CA: Learning Policy Institute.
8. Podolsky, A., & Sutcher, L. (2016). *California teacher shortages: A persistent problem*. Palo Alto, CA: Learning Policy Institute and California School Boards Association.
9. Ranjana, D. (2009). *Investigating the impact of substitute teachers on student achievement: A review of the literature*. Albuquerque, NM: Albuquerque Public Schools. http://www.aps.edu/accountability-reporting/documents/2008-2009-publications/impact-of-substitue-teachers-on-student-achievement-research-brief-jan-2009 (accessed 12/5/16); Miller, R. T., Murnane, R. J., & Willett, J. B. (2008). Do teacher absences impact student achievement? Longitudinal evidence from one urban school district. *Educational Evaluation and Policy Analysis, 30*(2), 181–200; Brown, S. L., & Arnell, A. T. (2012). Measuring the effect teacher absenteeism has on student achievement at an 'urban but not too urban:' Title I elementary school. *International Journal of Humanities and Social Science, 2*(17), 172–183; Boyd, D., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2006). How changes in entry requirements alter the teacher workforce and affect student achievement. *Education Finance and Policy, 1*(2), 176–216; Darling-Hammond, L., Holtzman, D. J., Gatlin, S. J., & Heilig, J. V. (2005). Does teacher preparation matter? Evidence about teacher certification, Teach for America, and teacher effectiveness. *Education Policy Analysis Archives, 13*(42). Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007). Teacher credentials and student achievement: Longitudinal analysis with student fixed effects. *Economics of Education Review, 26*(6), 673–682. Noell, G.H., Porter, B.A., Patt, R.M., & Dahir, A. (2008). Value added assessment of teacher preparation in Louisiana: 2004–2005 to 2006–2007. *Department of Psychology, Louisiana State University*. http://www.regents.la.gov/assets/docs/2013/09/Final-Value-Added-Report-12.02.08-Yr5.pdf (accessed 1/7/2017).
10. Ingersoll, R., Merrill, L., & May, H. (2014). *What are the effects of teacher education and preparation on beginning teacher attrition?* Philadelphia, PA: Consortium for Policy Research in Education; Podolsky, A., Kini, T., Bishop, J., & Darling-Hammond, L. (2016). *Solving the teacher shortage: How to attract and retain excellent educators.* Palo Alto, CA: Learning Policy Institute; Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38*(3), 499–534.
11. Re-entrants (fully credentialed teachers returning to the classroom after having left teaching for a period of time) are another component of teacher supply. Nationally, fewer than a third of teachers who leave return within five years, and chances that they will return continue to decline thereafter. *See* Grissom, J. A., & Reininger, M. (2012). Who comes back? A longitudinal analysis of the re-entry behavior of exiting teachers. *Education Finance and Policy, 7*(4), 425–454. p. 428–429; Murnane, R., Singer, J. D., Willett, J. B., Kemple, J., & Olsen, R. (2009). Who will teach? Policies that matter. Cambridge, MA: Harvard University Press.
12. Fong, A. B., Makkonen, R., & Jacquet, K. (2016). *Projections of California teacher retirements: A county and regional perspective.* (2017). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory West. http://ies.ed.gov/ncee/edlabs (accessed 12/7/16).

13. Feng, L., & Sass, T. R. (2013). What makes special-education teachers special? Teacher training and achievement of students with disabilities. *Economics of Education Review, 36*, 122–134; Nougaret, A. A., Scruggs, T. E., & Mastropieri, M. A. (2005). Does teacher education produce better special education teachers? *Exceptional Children, 71*(3), 217–229; Sindelar, P. T., Daunic, A., & Rennells, M. (2004). Comparisons of traditionally and alternatively trained teachers. *Exceptionality, 12*, 209–223.; Boe, E., Shin, S., & Cook, L. H. (2007). Does teacher preparation matter for beginning teachers in either special or general education? *Journal of Special Education, 41*(3), 158–170.; Brownell, M. T., Haager, D., Bishop, A. G., Klingner, J.K., Menon, S., Penfield, R., & Dingle, M. (2007). *Teacher quality in special education: The role of knowledge, classroom practice, and school environment.* Paper presented at the annual meeting for American Education Research Association, Chicago, IL.

14. Boe, E., Shin, S., & Cook, L. H. (2007). Does teacher preparation matter for beginning teachers in either special or general education? Journal of Special Education, 41(3), 158–170. Nougaret, A. A., Scruggs, T. E., & Mastropieri, M. A. (2005). Does teacher education produce better special education teachers? *Exceptional Children, 71*(3), 217–229.

15. Mohr, W. K., & Anderson, J. A. (2001). Faulty assumptions associated with use of restraints with children. *Journal of Child and Adolescent Psychiatric Nursing, 14* (3), 141–151.

16. In 2015–16, Black students made up approximately 8.7% of students enrolled in special education and 5.8% of total student enrollment (California Department of Education DataQuest, http://data1.cde.ca.gov/dataquest/, accessed 12/27/16). In 2012–13, English Learners made up approximately 27.8% of students enrolled in special education (California Task Force on Special Education 2015 Report) and 21.6% of total student enrollment (California Department of Education DataQuest, http://data1.cde.ca.gov/dataquest/, accessed 12/27/16).

17. *Education specialist instruction credential.* (2016). Sacramento: Commission on Teacher Credentialing. http://www.ctc.ca.gov/credentials/leaflets/cl808ca.pdf (accessed 12/14/17).

18. EDJOIN ran custom queries for the Learning Policy Institute tallying openings at the start of the year by subject and by county.

19. California Department of Education DataQuest, http://data1.cde.ca.gov/dataquest/, accessed 12/20/16.

20. Legislative Analyst's Office. Proposition 58. http://www.lao.ca.gov/ballot/2016/Prop58-110816.pdf (accessed 12/13/2016).

21. *Bilingual authorization program standards.* (2015). Sacramento: Commission on Teacher Credentialing. http://www.ctc.ca.gov/educator-prep/standards/bilingual-authorization-handbook.pdf (accessed *11/21/16).*

22. *Bilingual authorization program standards.* (2015). Sacramento: Commission on Teacher Credentialing. http://www.ctc.ca.gov/educator-prep/standards/bilingual-authorization-handbook.pdf (accessed 11/21/16).

23. *Commission-approved educator preparation programs*. Sacramento: Commission on Teacher Credentialing. http://www.ctc.ca.gov/reports/data/app-edu-prep-prog.html (accessed 12/20/16).

24. Podolsky, A., & Sutcher, L. (2016). *California teacher shortages: A persistent problem (brief)*. Palo Alto, CA: Learning Policy Institute and California School Boards Association. This survey received responses from 19 of the 25 largest school districts. About 16% of the 19 districts noted bilingual shortages, or 12% of all 25 largest districts.

25. Valentino, R. A., and Reardon, S. F. (2015). Effectiveness of four instructional programs designed to serve English learners: Variation by ethnicity and initial English proficiency. *Educational Evaluation and Policy Analysis. 37*(4), 612–637; Umansky, I., and Reardon, S. F. (2014). Reclassification patterns among Latino English learner students in bilingual, dual immersion, and English immersion classrooms. *American Educational Research Journal, 51*: 879–912; Thomas, W. P., and Collier, V. P. (2002). *A national study of school effectiveness for language minority students' long-term academic achievement*. Santa Cruz, CA: Center for Research on Education, Diversity, and Excellence.

26. Gandara, P. (2015). Rethinking bilingual instruction. *Educational Leadership*, 60–64.

27. *California State Plan to Ensure Equitable Access to Excellent Educators* (2016). Sacramento: California Department of Education. http://www.cde.ca.gov/be/pn/im/documents/memo-ilssb-plsd-dec16item01.doc (accessed 12/21/16).

28. Podolsky, A., & Sutcher, L. (2016). *California teacher shortages: A persistent problem (brief)*. Palo Alto, CA: Learning Policy Institute and California School Boards Association.

29. *2016–17 State funded grant programs: Announcement of awards.* (2016). Sacramento, CA: Commission on Teacher Credentialing. http://www.ctc.ca.gov/commission/agendas/2016-12/2016-12-2A.pdf (accessed 12/12/16).

30. *Commission awards grant funding to ease teacher shortage.* (2016). Sacramento, CA: Commission on Teacher Credentialing. http://www.ctc.ca.gov/briefing-room/pdf/PR-2016-12-07.pdf (accessed 12/12/16).

31. Leal, F., & Fensterwald, J. (2016). College campuses to receive $8 million to boost teacher-prep programs. Oakland, CA: EdSource. https://edsource.org/2016/college-campuses-to-receive-8-million-to-boost-teacher-prep-programs/574084 (accessed 12/12/2016); *Commission awards grant funding to ease teacher shortage*. (2016). Sacramento, CA: Commission on Teacher Credentialing. http://www.ctc.ca.gov/briefing-room/pdf/PR-2016-12-07.pdf (accessed 12/12/16).

32. Classified staff are non-certificated staff and include clerical staff, instructional assistants (paraprofessionals), custodians, and accounting personnel. Certificated staff include teachers, administrators, speech therapists, school psychologists, and nurses. *See* California Department of Education Glossary of Terms, http://www.cde.ca.gov/ds/sd/cb/glossary.asp#c (accessed 2/1/2017).

33. Leal, F. (2016). State awards $20 million in grants to help more school employees become teachers. Oakland, CA: *EdSource*. https://edsource.org/2016/state-awards-20-million-in-grants-to-help-more-school-employees-become-teachers/574511 (accessed 12/21/2016); California Commission on Teacher Credentialing.(n.d.). *California Classified School Employee Teacher Credentialing Program funding decisions*. http://www.ctc.ca.gov/files/2016-11-funding-rec-classified.pdf (accessed 12/21/2016).

34. Boyd, D., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2006). How changes in entry requirements alter the teacher workforce and affect student achievement. *Education Finance and Policy, 1*(2), 176–216; Darling-Hammond, L., Holtzman, D. J., Gatlin, S. J., & Heilig, J. V. (2005). Does teacher preparation matter? Evidence about teacher certification, Teach for America, and teacher effectiveness. *Education Policy Analysis Archives, 13*(42); Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007). Teacher credentials and student achievement: Longitudinal analysis with student fixed effects. *Economics of Education Review, 26*(6), 673–682; Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38*(3), 499–534; Ingersoll, R., Merrill, L., & May, H. (2014). *What Are the Effects of Teacher Education and Preparation on Beginning Teacher Attrition?* Philadelphia, PA: Consortium for Policy Research in Education, CPRE Report (#RR–82); Podolsky, A., Kini, T., Bishop, J., & Darling-Hammond, L. (2016). *Solving the teacher shortage: How to attract and retain excellent educators*. Palo Alto, CA: Learning Policy Institute.

35. Santa Clara Unified School District school board member quotation provided via fall 2016 California School Boards Association survey.

36. Podolsky, A., & Kini, T. (2016). *How effective are loan forgiveness and service scholarships for recruiting teachers?* Palo Alto, CA: Learning Policy Institute.

37. Rothstein, J. & Rouse, E.R. (2011). Constrained after college: Student loans and early-career occupational choices. *Journal of Public Economics, 95*(1–2), 149–163.; Baum, S. & O'Malley, M. (2003). College on credit: How borrowers perceive their education debt. *Journal of Student Financial Aid, 33*(3), 7–19; Podolsky, A. & Kini, T. (2016). *How effective are loan forgiveness and service scholarships for recruiting teachers? (brief)*. Palo Alto, CA: Learning Policy Institute.

38. Henry, G. T., Bastian, K. C., & Smith, A. A. (2012). Scholarships to recruit the 'best and brightest' into teaching: Who Is recruited, where do they teach, how effective are they, and how long do they stay? *Educational Researcher, 41*(3), 83–92; Podolsky, A., & Kini, T. (2016). *How effective are loan forgiveness and service scholarships for recruiting teachers?* Palo Alto, CA: Learning Policy Institute.

39. Guha, R., Hyler, M.E., & Darling-Hammond, L. (2016). *The teacher residency: An innovative model for preparing teachers.* Palo Alto, CA: Learning Policy Institute. *See also* National Center for Teacher Residencies. (2016). *NCTR Network Partner Report 2015–16*. Chicago, IL: National Center for Teacher Residencies; Perlstein, L., Jerald, C., & Duffrin, E. (2014). *Building effective teacher residencies.* Chicago, IL: Urban Teacher Residency United; Papay, J. P., West, M. R., Fullerton, J. B., & Kane, T. J. (2012). Does an urban teacher residency increase student achievement? Early evidence from Boston. *Educational Evaluation and Policy Analysis, 34*(4), 413–434; Silva, T., McKie, A., & Gleason, P. (2015). *New findings on the retention of novice teachers from teaching residency programs.* Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences. https://ies.ed.gov/ncee/pubs/20154015/pdf/20154015.pdf (accessed 12/7/2017); Tennessee Higher Education Commission. (2014). Tennessee Teacher Preparation Report Card 2014 State Profile. https://www.tn.gov/assets/entities/thec/attachments/reportcard2014A_Tennessee_State_Profile.pdf (accessed 1/18/2017); Sloan, K., & Blazevski, J. (2015). *New Visions Hunter College Urban Teacher Residency: Measures of success*. Bloomington, IN: Rockman et al.

40. Guha, R., Hyler, M.E., & Darling-Hammond, L. (2016). *The teacher residency: An innovative model for preparing teachers*. Palo Alto, CA: Learning Policy Institute.

41. Learning Policy Institute. (2016). *Teacher residencies in California*. Palo Alto, CA: Learning Policy Institute.; Guha, R., Hyler, M.E., & Darling-Hammond, L. (2016). *The teacher residency: An innovative model for preparing teachers.* Palo Alto, CA: Learning Policy Institute.

42. Kini, T., & Podolsky, A. (2016). *Does teaching experience increase teacher effectiveness? A review of the research (brief)*. Palo Alto, CA: Learning Policy Institute.

43. Data provided by California State Teachers' Retirement System in response to LPI request.

44. *Working after retirement: Know the rules.* (2016). Sacramento, CA: California State Teachers Retirement System (CalSTRS). http://www.calstrs.com/sites/main/files/file-attachments/workingafterretirement2016.pdf (accessed 12/27/16)/

45. National Education Association Research. (2015) *Rankings and Estimates* (tables C–9 and C–11). Washington, DC: National Education Association.

46. CalSTRS Member Handbook, 2011–2012. http://www.calstrs.com/pod/past-member-handbooks (accessed 1/25/2017).

47. Birley, C., & Eichstadt, K. (1998). *Deferred retirement option programs*. Reno, NV: Davis Graham & Stubbs. https://www.dgslaw.com/images/materials/606313.pdf (accessed 1/29/17).

48. Kim, D., Koedel, C., Ni, S., Podgursky, M., & Wu, W. (2016). *Pensions and late career teacher retention*. Columbia, MO: Department of Economics, University of Missouri.

49. Sutcher, L., Darling-Hammond, L., & Carver-Thomas, D. (2016). *A coming crisis in teaching? Teacher supply, demand, and shortages in the U.S.* Palo Alto, CA: Learning Policy Institute.

50. Podolsky, A., Kini, T., Bishop, J., & Darling-Hammond, L. (2016). *Solving the teacher shortage: How to attract and retain excellent educators.* Palo Alto, CA: Learning Policy Institute.

51. Levin, J., Berg-Jacobson, A., Atchison, D., Lee, K., & Vontsolos, E. (2015). *Massachusetts study of teacher supply and demand trends and projections.* Washington, DC: American Institutes for Research. *See also*, *Teaching scholarships in Massachusetts.* http://www.teachingdegree.org/massachusetts/scholarships/.

52. Darling-Hammond, L. (2003). Access to quality teaching: An analysis of inequality in California's public schools. *Santa Clara Law Review, 43*(4), 1045–1184.

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