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June 1, 2020

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## **RE: California State University Mathematics and Science Teacher Initiative Report**

This report is about the California State University (CSU) Mathematics and Science Teacher Initiative (MSTI). The report provides (1), annual information on the number of mathematics and science teachers credentialed, (2), an expenditure plan, (3), a report of the initiative's different components and activities, including best practices, and (4) the job placement of students who earn a mathematics or science teaching credential.

The report is important because the state of California continues to experience a severe teacher shortage in mathematics and science. The CSU strategies for addressing the shortage are the primary feature of MSTI and its activities are critical to ensuring that California's students are taught by qualified mathematics and science teachers.

The annual report is provided each year in accordance with Provision 5 of the Budget Act of 2009. It indicates the four areas to be covered in an annual report due on May 31.

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**CSU Campuses**  
Bakersfield  
Channel Islands  
Chico  
Dominguez Hills  
East Bay

Fresno  
Fullerton  
Humboldt  
Long Beach  
Los Angeles  
Maritime Academy

Monterey Bay  
Northridge  
Pomona  
Sacramento  
San Bernardino  
San Diego

San Francisco  
San José  
San Luis Obispo  
San Marcos  
Sonoma  
Stanislaus

**CSU Report: Mathematics and Science Teacher Initiative Report**

May 1, 2018

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Should you have any questions about this report, please contact *Frederick Uy*, Director of Educator Preparation and Public School Programs, at [fuy@calstate.edu](mailto:fuy@calstate.edu) or (562) 941-4713.

Sincerely,



Steven Relyea (Jun 1, 2020 16:47 PDT)

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Executive Vice Chancellor and  
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SR:dr

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**The California State University**  
WORKING FOR CALIFORNIA

**CALIFORNIA STATE UNIVERSITY  
MATHEMATICS AND SCIENCE TEACHER INITIATIVE**

**ANNUAL REPORT**

**CALIFORNIA STATE UNIVERSITY  
OFFICE OF THE CHANCELLOR**

**MAY 2020**

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# California State University Mathematics and Science Teacher Initiative (MSTI)

## Overview

Through the implementation of its systemwide Mathematics and Science Teacher Initiative (MSTI), the California State University (CSU) has supported the production of mathematics and science teachers. Since the program began, CSU campuses have increased the annual number of mathematics and science teachers from 750 in 2002-03 to more than 850 in 2018-19. CSU campuses currently produce the highest number of mathematics and science teachers in the state. In these chronic shortage fields for grades K-12, data collected by the California Commission on Teacher Credentialing (CTC) for the 2018-19 program year showed that CSU campuses prepared a total of 857 preliminary and intern credential teachers, of which 385 were in mathematics and 472 were in science. This outcome represents an unexpected systemwide decline in production of 66 teachers (7%) compared to the prior year. The decline was more pronounced in science than math and production trends varied considerably by campus. We plan to conduct a deeper investigation into the factors contributing to these variations. Some of the factors we plan to explore include STEM majors seeking non-teaching careers due to higher pay, fewer job prospects due to declining K-12 student enrollment, etc. We will also investigate the relationships between specific recruitment strategies used in different programs with their production outcomes in order to continue to identify more robust innovative ways of recruiting STEM teachers.

To leverage further the investment of supporting the MSTI initiative in addressing the state's STEM teacher shortage and indicate his belief in the program, Chancellor Timothy White invested \$10,000,000 for the next four years (2019 – 2023). This investment enabled each campus to double its funding allocation for 2019-20. Together these investments will help support campuses in the recruitment of diverse candidates, and first-rate preparation of these candidates to become teachers of science and mathematics. They also will help campuses address the teacher shortage in these critical fields by not only attracting more students in the programs, but also by retaining current teachers in the workforce.

Utilizing MSTI resources in strategically planned efforts, CSU campuses not only have been effective in the production of mathematics and science teachers, but also have been successful in acquiring federal grants to supplement the initiative. This includes prestigious Robert Noyce scholarship awards from the National Science Foundation (NSF). Furthermore, the CSU has developed strong partnerships with the U.S. Department of Energy, the National Aeronautics and Space Administration (NASA), and the National Oceanographic and Atmospheric Administration (NOAA). These agencies have provided more than 750 research internships in leading federal labs for CSU future mathematics and science teachers.

CSU's success in mathematics and science teacher preparation includes the continuation of its being a leading partner in the 100Kin10 national initiative. Started in 2011, this is a group of national foundations, education institutions, and businesses that have joined to prepare 100,000 excellent science, technology, engineering, and mathematics (STEM) teachers over the next ten years. As part of the initiative, CSU has committed to sustain and grow its preparation of new mathematics and science teachers annually. CSU priorities in the 100Kin10 initiative include: producing increased numbers of teachers in severe shortage fields; placing new mathematics and science teachers in high-need schools; and preparing candidates credentialed in more than one STEM discipline to assist hard-to-staff schools.

## Background

In 2018, Learning Policy Institute reported that there is a continued projected need for new mathematics and science teachers in California over the next ten years<sup>1</sup>. The demand for mathematics and science teachers is far greater than the pool of teachers credentialed in these fields, and many students in the state continue to be taught by teachers who are under-prepared or unprepared in these subjects. Some teachers were even unauthorized to teach these subject areas.

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<sup>1</sup> Darling-Hammond, L., Sutcher, L., & Carver-Thomas, D. (2018). *Teacher Shortages in California: Status, Sources, and Potential Solutions* (research brief). Palo Alto, CA: Learning Policy Institute.

There is a direct relationship between a teacher's qualifications, in terms of certification, subject-matter knowledge, highest degree, and years of experience, and student achievement. Students with less-qualified mathematics and science teachers demonstrate lower achievement gains than those whose teachers are more qualified.

The crisis of an inadequate number of fully- and well-prepared STEM teachers has been persistent. More often than expected, less-qualified teachers are placed disproportionately in schools with the highest needs, mostly located in urban areas and primarily serve students of color. Unfortunately, a noticeable high percentage of these unqualified teachers are found in many mathematics and science classrooms.

Compared to other institutions, the CSUs as a system produces the largest numbers of mathematics and science teachers in California, averaging annually at least 30% of new teachers in these fields<sup>2</sup>. Through MSTI, each CSU campus implements strategies based on its strengths and the needs and opportunities in the area it serves. All campuses have an annual action plan with goals for increased credential production and strategies for reaching those goals.

The campus approaches are integrated within the CSU systemwide initiative that includes seven comprehensive strategies. The evidence from efforts in mathematics and science teacher preparation indicate there is not one simple solution to increasing the production of STEM teachers. Various obstacles to increasing recruitment and production exist, and these obstacles must be addressed through a multi-faceted approach for sustained effectiveness. The CSU approach includes the following:

- a. recruitment of diverse new students,
- b. increasing production through new credential pathways,
- c. financial support to attract outstanding candidates and facilitate credential completion,
- d. community college program alignment,
- e. online and in-person test preparation,
- f. partnerships with federal labs and industry, and
- g. identification of the most successful approaches to share with other campuses.

Campuses work diligently together to support these approaches and put structures in place to for the campuses to share ideas and to assist each other in applying such approaches.

Finally, significant attention is given to the state curriculum standards in the preparing of new mathematics and science teachers. CSU's leadership in these areas has been recognized in its receiving major federal and philanthropic grants for teacher preparation approaches addressing the standards.

### **Expenditure of Mathematics and Science Teacher Initiative Funds**

The 2019-20 State Budget appropriated \$2.713 million for the CSU Mathematics and Science Teacher Initiative. In addition to this, the MSTI budget for each campus was doubled as a result of the additional funding that Chancellor White allocated to the campuses. The expenditure plan adopted for these funds consists of two primary components, as described below.

- Support provided for each of the 22 campuses preparing mathematics and science teachers to implement these approaches such as: (a) comprehensive recruitment efforts, (b) a range of credential pathways to increase mathematics and science credential production, (c) financial support for candidates, (d) programs aligned with community colleges, and (e) test preparations: **\$4,454,000 (\$2,227,000 original amount, \$2,227,000 added amount)**.
- Statewide management and administration, including activities aimed at: (a) acquiring external resources

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<sup>2</sup> California Commission on Teacher Credentialing. (2020). Teacher Supply Credentials. Retrieved from: <https://www.ctc.ca.gov/commission/reports/data/edu-supl-creds>

through aligned federal and philanthropic funds, (b) monitoring program implementation and effectiveness by the Educator Quality (EdQ) Center, (c) recruitment efforts of the EduCorps initiative, (d) disseminating effective practices, and (e) program management and administration: **\$466,500**.

Campus funding was, as in previous years, based on and reflected the production of mathematics and science teachers by each campus. This approach has been used during the previous years in order to target resources effectively. Allocations to campuses ranged from \$55,000 to \$160,000 in 2019-20, and individual campus amount was based on (a) production, (b) increases achieved during the entire period of the systemwide initiative, and (c) total campus annual production. In order to receive an allocation, each campus was required to submit a plan that included:

- Credential production targets
- Action steps for increasing production and recruitment of diverse candidates to become mathematics and science teachers
- A detailed budget and budget justification for the allocation
- A progress report, including the identification of effective strategies and best practices

Purposes for which the campus allocations are being used follow systemwide guidelines. These guidelines are for administrative fees, faculty salaries, consultants, and travel in order to ensure that resources are targeted primarily to assisting students in entering and completing credential preparation. Only activities that are directly related to mathematics and science teacher recruitment and preparation can be supported, and the funds cannot be used to offset costs of instruction or student support that are part of ordinary campus academic programs. All budgets are reviewed thoroughly by the MSTI Director to ensure conformity with these requirements.

Budget items for which campuses used MSTI funds included the following items:

- Scholarships to assist students in completing their mathematics or science credential
- Support to programs like STEM Teacher and Researcher (STAR) in Cal Poly San Luis Obispo to gain a better understanding and experience in STEM
- Stipends to students who served as mathematics or science aides or tutors in PK-12 schools or as STEM assistants in extended learning programs
- Dedicated project coordinators and support staff responsible for advising, planning, management, and reporting
- Recruitment and diversification efforts and outreach
- Coordination with community colleges and advising for community college students
- Review and preparation for the California Subject Examination for Teachers (CSET) in mathematics and science
- Maintenance and improvement of project websites of campuses

Systemwide guidance regarding the use of MSTI funds is provided to ensure that activities are undertaken that have significant promise for recruiting diverse candidates to become preparing new mathematics and science teachers. In addition, a primary feature of systemwide management is strategic use of program funds to leverage federal and philanthropic funding.

### **Effectiveness of Mathematics and Science Teacher Initiative Components**

The components of MSTI are integrated into a comprehensive systemwide strategy that is recognized as being one of the most significant efforts for increasing mathematics and science teacher preparation that has been undertaken nationally. The five distinctive features of the initiative are as follow:

- **Institutional commitment that is articulated and reinforced at multiple levels**

A first feature that has supported program effectiveness is institutional commitment at all levels. Support of campus academic leaders and staff, engagement of science, mathematics and education faculty, and

cooperative efforts to attract, recruit, and prepare diverse outstanding candidates are characteristic of MSTI. The programs on campuses have mutually supportive leadership among the top academic leaders in STEM and teacher preparation.

- **Comprehensive recruitment and financial support**

A second feature that has been instrumental in supporting program effectiveness is the integration of comprehensive recruitment strategies and financial support. Strategies for recruiting candidates from diverse populations are directly aligned with scholarships and paid field experiences working with K-12 students to enable candidates from diverse backgrounds to complete a credential program without incurring significant student debt.

- **Approaches that connect future teachers with communities of practice that include scientists and mathematicians as well as other dedicated teachers in STEM disciplines**

A third feature supporting effectiveness in preparation connects future teachers with science and mathematics communities of practice. In programs like the STAR program at Cal Poly San Luis Obispo, CSU STEM teacher candidates are directly involved in scientific practice and discourse, and the programs engage them as members of professional communities with leading scientists. Every CSU campus has had STEM teacher candidates participate in STAR.

- **Broad-ranging collaboration and partnerships with other educational entities and with federal science agencies**

A fourth feature advancing effectiveness involves collaborative strategies and partnerships that often extend beyond traditional boundaries. These include innovative partnerships between colleges of education, science, and engineering that have resulted in recruitment of outstanding undergraduates in a range of STEM majors.

A variety of partnerships also exist with K-12 educational institutions and higher education. Included are partnerships with the California STEM Network statewide initiative led by Children Now. It is one of the state networks that is committed to advancing K-12 STEM teaching and learning. Another significant partnership is with the CDE (Californians Dedicated to Education) Foundation. CSU has also been an active partner in the annual STEAM Symposium it leads.

MSTI has an important higher education partnership with the Association of Public Land Grant Universities (APLU) through the Mathematics Teacher Education Partnership (MTEP). Its goal is to enhance the preparation of mathematics candidates at the secondary level. All CSU campuses has representation in the CSU systemwide MTEP. Through it, campuses are collaborating in research-based efforts aimed at recruiting more mathematics teacher candidates and enhancing their content and clinical preparation. CSU is the largest participant in the national MTEP and plays a prominent role in the APLU initiative.

Another important set of partnerships has been with philanthropic foundations and corporate supporters who are committed to advancing STEM education and teacher preparation. These partnerships have included the S. D. Bechtel, Jr. Foundation and Chevron. The S. D. Bechtel, Jr. Foundation provided support for grants to campuses that included attention to enhancing the STEM content and pedagogical expertise of teacher candidates. This funding has enabled CSU campuses to be leaders in addressing the Common Core State Standards Mathematics (CCSSM) and the Next Generation of Science Standards (NGSS) at all grade levels.

The Chevron Corporation also has provided support to CSU for its work in mathematics and science. Through its support, campus courses, labs, practicums, and field experiences have been revised to address (a) scientific and engineering practices, (b) crosscutting concepts in science, and (c) the engineering design process. Moreover, Chevron supported the following programs: STAR and

Makerspace initiatives. The STAR program has placements in federal and other distinguished research laboratories for students each summer, and participants become members of a community of teacher-researchers and have ongoing professional development opportunities. Makerspace initiatives include makerspaces and Fabrication labs; these have been established in a range of formal and informal learning environments (e.g. after-school and summer programs) where students can explore, create, and invent, using a variety of materials. Sonoma State University has established a Maker Certificate program and two other campuses, San Diego State University and California State University Sacramento, are planning Certificate programs to serve their respective regions.

- **Rigorous data systems and evaluation procedures for monitoring outcomes**

A fifth feature that has been instrumental in supporting program effectiveness is the thorough data systems to monitor candidate progress and program outcomes. Staff of the Educator Quality Center (EdQ), another unit of the Educator Preparation and Public School Programs division, compiles data to enhance educator preparation throughout the CSU and supports all 23 campuses in applying these data to improve their programs and results. EdQ data includes surveys of teachers and their employers about the quality and effectiveness of CSU teacher preparation, data on employment outcomes for CSU-prepared teacher candidates, and teacher pipeline data to track candidates through recruitment, application, admission, enrollment, and program completion.

## **Identification of Best Practices**

Best practices have been identified for each factor associated with effectiveness by examining relationships between the factors and changes in credential production. There has been a consistent association between certain approaches and large increases in the preparation of well-qualified teachers Institutional Commitment

In the case of institutional commitment, a common feature is seen at both campuses that began with little institutional engagement but that now have science and mathematics teacher preparation as a campus-wide priority, and those that have a long tradition of commitment to this area and where the institution has more than doubled its enrollments. The feature characteristic of the institutional commitment is sometimes referred to as nested leadership. There is a concerted, campus wide effort that involves the President, Provost, Deans, Department Chairs, and faculty all working toward the same goal. The actions at each level support one another and yield a culture of campus wide support for a long-term commitment to attracting and preparing outstanding new mathematics and science teachers.

### **A. Recruitment**

In recruitment, campuses use a variety of approaches. These include nominations by professors of candidates likely to be successful in a teaching career, social media, advertising, and pre-teaching clubs. They provide advising and mentoring, host numerous events, and develop networks of students interested in pursuing a mathematics or science credential. They provide support for early field experiences of varying durations, some paid and some unpaid, depending in large part on the candidates' ability to make a sustained time commitment. They also use annually award MSTI funds for small scholarships for students in mathematics and science teacher pathways.

In addition, EduCorps helped campus recruitment and diversification strategies to increase the number of students entering CSU's teacher preparation programs, especially in high-need areas including mathematics and science. On a number of campuses, the MSTI recruitment and diversification initiatives coordinated and collaborated with EduCorps.

### **B. Financial Support**

For financial support, campus efforts to secure external scholarship funding for candidates have been effective. The use of MSTI funds as aligned to resources to secure federal funds and the commitment of these funds for the entire period of federal grants has helped CSU campuses obtain scholarships that attract outstanding

mathematics and science majors into teaching. CSU campuses have been awarded National Science Foundation Robert Noyce scholarships and fellowships, with Noyce awards given to well over 100 candidates. As stipulated in the award, scholarships are for one to three years leading to a teaching credential while fellowships continue support for up to four years thereafter.

### C. Branding

The concurrent branding of mathematics and science teaching as a prestigious career choice is a best practice that many campuses use. Some achieve this through engaging messages on bookmarks, posters, and ads. Others have created exciting videos that demonstrate how mathematics and science teaching careers are attractive and highly rewarding. The STAR program is an example of a best practice communicating the prestige of STEM teaching and enabling future science and mathematics teachers to participate actively in scientific communities of practice. Through it, outstanding science teacher candidate's work with some of the nation's leading researchers.

### D. Test Preparation

An important practice undertaken by most CSU campuses is test preparations and review for CSET: Mathematics and CSET: Science that candidates are required to pass to enter the program. Campuses provide face-to-face and online preparation, campus-based test preparation workshops, and non-credit test preparation courses for mathematics and science candidates as part of MSTI. In some cases, MSTI funds are used to reimburse the cost of candidate registration for required CSETs.

### E. Monitoring and Reporting Systems

As noted earlier, another best practice enhancing MSTI effectiveness pertains to thorough and refined data systems for monitoring candidate progress and program outcomes. Robust data systems managed by the CSU Educator Quality Center are used to (a) identify the program models that are most effective in increasing production of well qualified mathematics and science teachers and (b) examining these programs to determine their distinguishing characteristics and strategic approaches. Furthermore, the Center's data collection and reporting systems enable educator preparation program leadership to track teacher candidates into the workforce, identify the characteristics of schools where they are employed, and analyze their degree of preparation based on feedback from candidates, first-year teachers, and their instructional supervisors.

## **Example MSTI Initiatives**

Based on the number of mathematics and science candidates it prepares, each campus receives an allocation annually for its MSTI program. The annual campus plans and activities represent the primary CSU systemwide MSTI implementation. Examples of campus strategies that represent best practices are found below.

### A. Collaboration with Computer Science Department

Significant MSTI activities focus on working closely with computer science departments to encourage and support candidates in obtaining a Supplementary Authorization in Computer Science. Campuses are providing courses and professional development for candidates and are offering computer science programs to local schools in order to provide field experiences for candidates and support computer science education in these schools.

### B. Grow Your Own Program

Campuses in the Central Valley work with rural school districts to increase their mathematics and science teachers. They offer Grow Your Own teacher pathways to recruit local students into teaching. The campuses reach out to the candidates in their own communities and provide advising, financial aid, and support services,

including their parents in outreach activities. The campuses also work with migrant education programs and the state Mini-Corps program to encourage and assist migrant youth in pursuing teaching careers.

Another excellent practice is supporting Learning Assistant programs. In these, candidates in mathematics and science teacher pathways and undergraduates in mathematics and science majors serve in teaching assistant roles, working with individual undergraduates or helping a faculty member as a course assistant. The Learning Assistant programs serve to encourage the undergraduate tutors—majors in mathematics and science—to pursue teaching as a career. Importantly, the programs may be coordinated with undergraduate academic tutoring as part of Graduation Initiative 2025.

#### C. Development of Minor Programs in Mathematics and Science

On a number of campuses, development of minors in mathematics and science enables undergraduates who are planning to pursue an elementary credential to take coursework that will prepare them to pursue an additional Foundational Level Mathematics (FLM) or Foundational Level General Science (FLGS) credential. Taking the coursework in the minor generally equips the candidates to pass the CSET needed to earn an FLM or FLGS credential or qualifies them to waive the CSET requirement.

#### D. Support for Professional Development

Many campuses support candidate participation at professional conferences, enabling them to participate in the community of mathematics and science teachers. For example, the campuses provide support for candidates to go as a group to the annual conferences sponsored by California Science Teachers Association (CSTA), California Mathematics Council (CMC), California Department of Education (CDE), Californians Dedicated to Education Foundation, Computer Using Educators (CUE), etc.

#### E. Working with Young Learners

Some campuses have exemplary programs run by the campus that involve candidates in working with children as a way of supporting their interest in teaching. One campus has a Hands-on Lab and another a Learning by Doing Lab. Local K-12 students visit the labs and candidates work with them and their teachers in structured learning activities. Two campuses have Digital Fabrication Labs (Fab Labs) and invite schools and community groups to visit the campus or participate in a Mobile Fab Lab. As part of MSTI, candidates in a mathematics or science pathway work with the visiting school and community groups in active hands-on programs addressing STEM and the engineering design process.

#### F. Innovative Programs

Another strong approach is one in which undergraduates participate in a local school, after-school, Saturday, or summer program, working with K-12 students in mathematics and science enrichment activities. These often include robotics, coding, and hands-on learning involving the engineering design process. The MSTI students may receive a scholarship or stipend in association with this work. The participants on some campuses are referred to as MSTI Fellows, creating distinction for the program. Often more than one undergraduate works at a field experience site with a resultant sense of community among the CSU students. One such program is the CSU Fresno Teaching Fellows program, a partnership with the California Teaching Fellows Foundation focused on teaching in after-school and summer programs.

#### G. Working with Community Colleges

On other campuses, MSTI collaborates closely with one or more community colleges. In some cases, the community college and CSU students together serve as STEM assistants in local schools or community organization STEM programs (e.g., Boys and Girls Clubs). In most cases, there is a comprehensive recruitment and advising program, with thorough coordination between the community college lower division mathematics and science experience—both academic and student services—and the CSU upper division mathematics and science preparation pathway and credential program.

Finally, some campuses are meeting with their area community colleges in conjunction with the Integrated Teacher Education Program (ITEP). Faculty in both segments work collaboratively to support the transfer process. These faculty focus on Associate Degree Transfer (ADT) and Transfer Model Curriculum (TMC).

#### H. High School Connection

On some campuses, MSTI outreach involves high school student engagement and working with students interested in teaching careers. Typically, a partnership includes middle and high school teachers and the collaboration includes students who are in a secondary Teaching Academy serving students interested in teaching. Programs may be undertaken with Educators Rising, which provides guidance for programs with local high school teacher clubs that offer a range of activities for students who wish to pursue or learn more about teaching and teaching careers.

#### I. Teacher Outreach Ambassadors

On several campuses, prospective mathematics and science teachers serve as Teacher Outreach Ambassadors. These university students work with high schools, community colleges, learning centers, outdoor activities, and at university events to promote careers in teaching, with an emphasis on mathematics and science. They, along with undergraduates, attend career fairs aimed at helping them make connections with potential employing school districts and schools.

### **Job Placement of CSU Students Who Earned a Mathematics or Science Teaching Credential**

A comprehensive analysis was conducted on the job placement of CSU mathematics and science completers from 2017-18 whose first year of teaching was in 2018-19. The findings were striking, demonstrating that large numbers teach in high-need schools. Of CSU mathematics and science teacher graduates:

- 71% taught in schools with more than half of the students in poverty, and over 88% taught in schools with 25% or more of the students in poverty;
- 44% taught in city schools, approximately 6% in rural schools, 7% in town schools, and the remainder in suburban schools;
- In the schools where graduates taught, approximately 33% of students met or exceeded math standards, somewhat lower than the California state average (statewide, 40% of students met or exceeded math standards);
- 77% taught in schools with less than 100% fully credentialed teachers.

California teacher workforce shortages underscore the importance of these job placements among CSU mathematics and science teachers—showing a sustained pattern in which the majority are in high-need schools.

Challenges of finding qualified mathematics and science teachers are acute among the state's high-need schools. The new mathematics and science teachers prepared by CSU are meeting the needs of California's school districts, teaching in the neediest schools and contributing substantially to overcoming inequities in the distribution of well qualified mathematics and science teachers.

### **Conclusions**

CSU campuses continued a pattern of new secondary mathematics and science teacher production in 2018-19. The new mathematics and science teachers produced by CSU campuses are taking job positions in high-need schools across the state. They are contributing markedly to addressing school district needs, including those in urban, rural, and low-income districts, and to reducing the disparities in access to fully qualified and diverse mathematics and science teachers that have existed in the state of California for decades.

## Mathematics and Science Teacher Production

Tables 1 and 2 present data from 2013-14 through 2018-19 for new teachers prepared in mathematics and science. The figures are based on the count by CTC of mathematics and science credentials that were received by preliminary credential candidates and intern credential candidates, including those who received Foundational Level Mathematics (FLM) and Foundational Level General Science (FLGS) preparation. Clear credentials, Subject Matter Authorizations, and Supplementary Authorizations were not counted<sup>3</sup>.

**Table 1: CSU Mathematics and Science Teacher Candidate Production by Subject: 2013-14 to 2018-19**

Subject	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Mathematics	488	459	430	408	417	385
Science	451	451	484	511	506	472
Total Mathematics and Science	939	910	914	919	923	857

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<sup>3</sup> California Commission on Teacher Credentialing. (2020). Teacher Supply Credentials. Retrieved from: <https://www.ctc.ca.gov/commission/reports/data/edu-supl-creds>

**Table 2: CSU Mathematics and Science Teacher Candidate Production by Campus: 2013-14 to 2018-19**

Campus	2013-14			2014-15			2015-16			2016-17			2017-18			2018-19		
	Math	Sci	Total															
Bakersfield	21	22	43	28	14	42	26	21	47	29	22	51	17	25	42	24	29	53
Channel Islands	9	10	19	9	6	15	3	8	11	10	9	19	5	13	18	3	12	15
Chico	13	19	32	11	10	21	13	14	27	12	17	29	16	26	42	12	21	33
Dominguez Hills	59	37	96	63	65	128	40	64	104	36	44	80	42	32	74	38	31	69
East Bay	33	35	68	22	27	49	25	25	50	22	29	51	35	36	71	17	34	51
Fresno	23	35	58	22	12	34	25	23	48	13	42	55	25	50	75	28	26	54
Fullerton	37	31	68	23	34	57	23	38	61	26	39	65	25	24	49	30	23	53
Humboldt	6	9	15	7	9	16	5	8	13	8	7	15	3	5	8	4	14	18
Long Beach	37	29	66	32	42	74	42	41	83	35	53	88	34	26	60	36	45	81
Los Angeles	22	16	38	28	14	42	18	25	43	23	14	37	11	13	24	8	13	21
Monterey Bay	21	5	26	21	11	32	10	5	15	10	12	22	13	19	32	10	22	32
Northridge	21	24	45	23	24	47	21	16	37	20	24	44	20	28	48	22	32	54
Pomona	15	21	36	19	24	43	25	18	43	13	16	29	17	17	34	15	9	24
Sacramento	17	30	47	20	17	37	12	25	37	20	24	44	19	12	31	7	20	27
San Bernardino	29	16	45	25	13	38	32	16	48	37	27	64	33	39	72	33	22	55
San Diego	32	21	53	27	31	58	34	25	59	26	29	55	30	36	66	32	22	54
San Francisco	17	9	26	12	13	25	9	15	24	7	14	21	18	20	38	16	12	28
San Jose	15	24	39	13	24	37	15	24	39	22	21	43	17	20	37	13	24	37
San Luis Obispo	11	27	38	4	13	17	10	18	28	9	34	43	11	25	36	4	17	21
San Marcos	14	7	21	19	25	44	9	20	29	7	12	19	9	8	17	9	16	25
Sonoma	17	16	33	16	14	30	18	17	35	7	8	15	6	11	17	7	11	18
Stanislaus	19	8	27	15	9	24	15	18	33	16	14	30	11	21	32	17	17	34
<b>Total</b>	488	451	939	459	451	910	430	484	914	408	511	919	417	506	923	385	472	857