

## **TEACHER PREPARATION PIPELINE STEM/CTE ANNUAL REPORT**

*The mission of the Teacher Preparation Pipeline STEM/CTE Collaborative is to provide a model of contextualized teacher preparation that successfully recruits, trains and supports existing and future educators throughout the state of California in the areas of STEM, Career Technical Education, higher education and K-12 education. California is facing an immediate teacher shortage. The Teacher Preparation Pipeline STEM/CTE Collaborative provides programs and services that enable all individuals to reach their career goals and fill the need for highly qualified teachers throughout California's labor market. The TPP STEM/CTE Collaborative is currently comprised of 10 colleges across the state, including Cabrillo College, College of the Canyons, Cerritos College, Cuyamaca College, Cypress College, El Camino College, Rio Hondo Community College, Saddleback College, City College of San Francisco and West Hills Lemoore. The Teacher Preparation Pipeline STEM/CTE initiative embodies and encourages effective practices in teacher preparation at the community college level and throughout the teacher preparation pipeline.*

*-Teacher Preparation Pipeline STEM/CTE Collaborative 2014-2015*

### **EXECUTIVE SUMMARY**

The Teacher Preparation Pipeline STEM/CTE Collaborative (TPP STEM/CTE) sought to “align career and technical education curriculum and student support service as a way to establish pipelines for students interested in teaching in today’s CTE fields”.<sup>1</sup> During the 2014-2015 year, the TPP campuses came together and created a Collaborative. This Collaborative focuses on the continuing development of a model of quality teacher preparation that includes career exploration, contextualized learning opportunities, teacher recruitment and retention, and the development of a quality teacher preparation model of collaboration that is currently shared regionally, statewide and beyond.

The TPP STEM/CTE Collaborative works with those within the TPP STEM/CTE network, but also provides guidance and support for non-TPP campuses that are looking to create or enhance their teacher preparation programs and resources. The TPP STEM/CTE Collaborative mentors other campuses interested in teacher preparation and welcomes new partnership opportunities.

---

<sup>1</sup> 2014 Career Technical Education Pathways Initiative Annual Report, CCCC

California is currently experiencing a teacher shortage that policy makers predict will only get worse in the upcoming years. Transcript studies on institutions attended by the nation's current classroom teachers suggest that more than 50% of teachers attended a community college for at least part of their education. Community colleges often provide most of the general content area courses future teachers receive. Fewer college students are choosing careers as teachers, presenting another challenge to meeting the projected demand. A recent report showed a 24% decline in enrollment in teacher credentialing programs during 2011-2012, and a decline of 66% statewide during the last decade. The CSU system issued just 5,787 credentials in 2011-12 compared to 13,933 in 2003-04.<sup>2</sup>

A fundamental need identified was to fill an estimated 51,500 openings for elementary school teachers and 31,100 jobs for secondary school teachers that would occur statewide between 2010 and 2020.<sup>3</sup> The median annual statewide salaries for elementary and secondary school teachers of \$67,496 and \$65,388 respectively, rank 8<sup>th</sup> and 9<sup>th</sup> among the 50 occupations in the report. Among the 10 best paid occupations listed, K-12 teaching is projected to have the highest number of job openings (82,600), second only to nursing (99,800). The regional work proposed by the TPP STEM/CTE Collaborative will support the state's need for qualified teachers.

In the 2013-2014 academic year, nearly 19,000 teacher candidates were enrolled in teaching credential programs. Approximately 65% of those teacher candidates were previously enrolled in a teacher preparation pathway program<sup>4</sup>. Teacher Preparation Pipeline STEM/CTE has developed and is refining an effective and transferrable model of teacher preparation that successfully recruits, trains and supports future teachers throughout the state of California. This model, developed in partnership with 10 community colleges across the state, will serve as a teacher preparation model for the Community College system in California, and beyond.

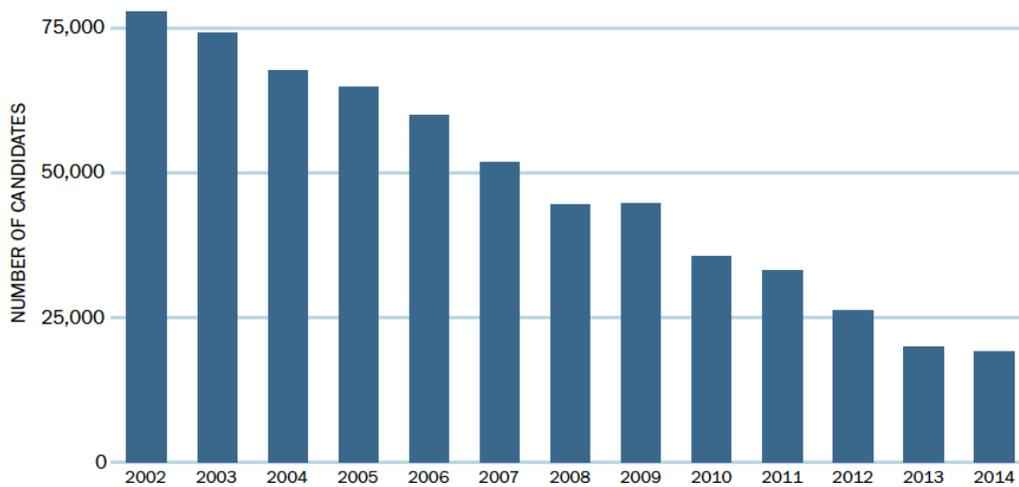
---

<sup>2</sup> Teacher Supply in California: A Report to the Legislature-Annual Report 2011-12, Commission on Teacher Credentialing, April 2013

<sup>3</sup> "Occupations With the Most Job Openings 2010-2020," Labor Market Information Division of the California Employment Development Department, 2012

<sup>4</sup> Annual Report Card on California Teacher Preparation Programs for the Academic year, 2013-2014", October 2015

Figure 5: **Enrollment in Teacher Preparation Programs Has Declined**



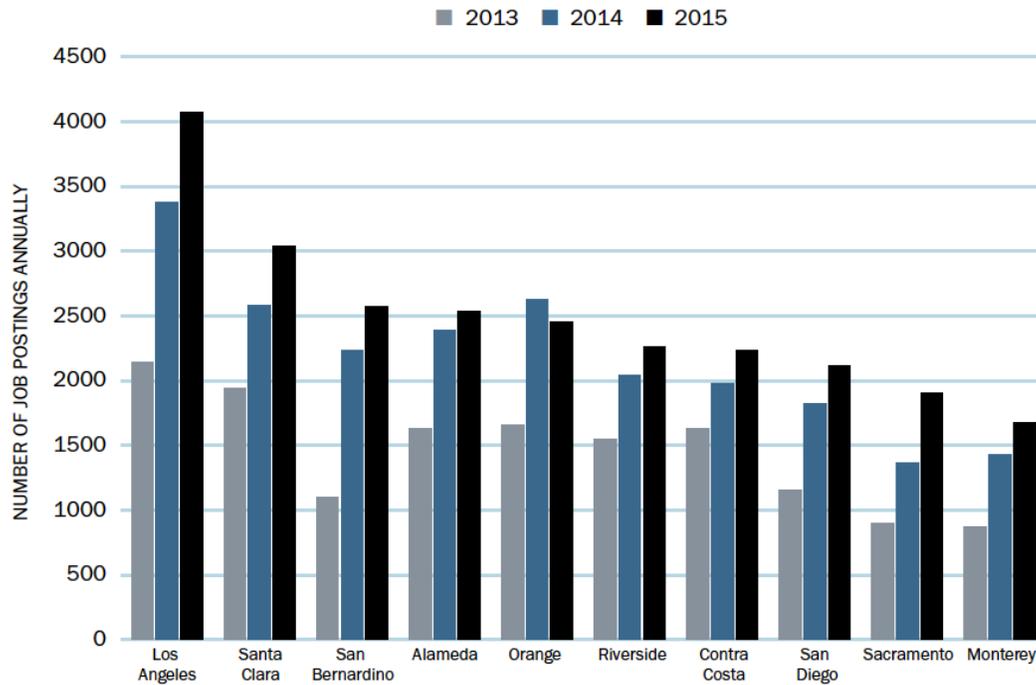
**Number of candidates enrolled in California teacher preparation programs, 2001-02 to 2013-14**

Source: California Commission on Teacher Credentialing, 2002-2014. Teacher Supply in California: A Report to the Legislature. Data available at <http://www.ctc.ca.gov/reports/all-reports.html>; 2014 Title II State Program Information. Data available at <https://title2.ed.gov/Public/Report/StateHome.aspx>.

© 2016 The Learning Policy Institute

The demand for teachers is growing and the number of candidates currently in teacher preparation programs will not meet the anticipated workforce needs in the field of education. In a recent report *Addressing California’s Teacher Shortage: An Analysis of Sources and Solutions* stated “Increased demand for K–12 teachers in California comes at a time when the supply of new teachers is at a 12-year low. Enrollment in educator preparation programs has dropped by more than 70 percent over the last decade, and has fallen below the number of estimated hires by school districts around the state.” Investment in quality teacher preparation programs will help address this upcoming crisis with ongoing development of regionalized efforts to align resources, coursework, contextualized learning, and opportunities for career development and professional networking. A collaborative and replicable model of teacher preparation will best meet the anticipated workforce needs in the field of education.

Figure 1: **Demand for Teachers Is Growing**



Note: Numbers reflect open teaching positions advertised on EdJoin over 12-month period, beginning October 16 and ending October 15.

Source: EdJoin data on postings for 12-month period, provided to LPI.

© 2016 The Learning Policy Institute

The Teacher Preparation Pipeline STEM/CTE Collaborative both exemplifies and encourages a regional and statewide model of teacher preparation that supports the state’s need for qualified teachers in the areas of STEM, CTE, higher education and K-12 education. California is in need of qualified teachers throughout the system and the goal of this model employed by the Teacher Preparation Pipeline STEM/CTE Collaborative is to positively impact California’s upcoming teacher shortage through sharing resources, standardizing practices, and providing a quality model of teacher preparation.

The mission of the TPP STEM/CTE Collaborative has been to identify effective practices in teacher preparation throughout the state of California, while developing partnerships and regional collaboration. Working with partner colleges (including CSU’s, UC’s and private universities), the 10 Teacher Preparation Pipeline STEM/CTE campuses developed a collaborative model of teacher preparation that creates regional opportunities for teacher preparation that can be duplicated throughout the state of

California. This project has specialized in targeted areas of teacher preparation, including STEM, CTE, K-12 and higher education.

## **THE REGIONAL SCOPE OF TEACHER PREPARATION PIPELINE STEM/CTE**

To achieve the goal of improving teacher preparation regionally, statewide, and beyond, the Teacher Preparation Pipeline STEM/CTE expanded opportunities for future teachers by encouraging regional collaboration throughout the state. Teacher Preparation Pipeline STEM/CTE campuses have reached out to their regional communities and partners to expand their reach throughout the state. Programs do not work in silos, but instead have worked to create a collaborative model of teacher preparation with regional specific activities, opportunities, and an inclusive approach to teacher preparation. The TPP STEM/CTE Collaborative currently implements the following regional broad range of activities:

**1. Science, Technology, Engineering and Math (STEM):** Increase the number and quality of STEM teachers throughout California by providing coursework, contextualized classroom experiences, and real life STEM experiences including specialized academic, career and personal counseling related to STEM teaching career pathways.

**2. Contextualized Learning:** Provide opportunities for contextualized learning that strengthen the development of future teachers throughout the state. Future teachers need various opportunities for fieldwork, Service Learning, volunteer and paid employment in related industry settings. A key component of pathway development and support is the provision of practical and verifiable workplace learning opportunities. For a future teacher pathway, these real-world experiences include a range of options.

**3. Career Technical Education:** Increase enrollment of CTE teachers throughout the state of California by providing opportunities for industry specific career exploration, career advising, (including pathway requirements) and CTE contextualized learning. CTE efforts have focused on increased awareness and enrollment of technically-skilled professionals who are receptive to teaching careers in CTE; including activities to promote and enroll students in courses at the community college that satisfy the coursework requirements for a secondary single subject or designated subject CTE teaching credential, that lead students to CTE teaching in the secondary schools; activities that lead to teaching in the community college system; activities to retain

students in CTE teacher preparation pathways, including those who transfer to four-year institutions; outreach to high schools, ROCPs, community colleges, four-year institutions and business/industry partners to identify, recruit, assess, enroll and retain students in courses that are part of a CTE teacher pathway.

**4. Collaboration:** Increase dialogue and collaboration between high schools, community colleges, CSUs, UCs and private universities in order to develop and maintain a consistent, positive, and significant experience for all future teachers. Institutions that collaborate benefit from each other's resources and provide a more seamless transition for students. As a result, it is critical for all stakeholders to collaborate and develop partnerships.

**5. Common Core State Standards and Next Generation Science State Standards:** Develop a deeper understanding of the shift in education pedagogy and methodology, including both training and professional development activities directly related to new state standards.

**6. Student Success, Career Pathways and Transitions:** Provide advising and counseling support services and follow-up on the *Student Educational Plan* for TPP STEM/CTE students who demonstrate an interest in a teaching career.

**7. A New Model of Teacher Preparation/Collaboration and Beyond:** The Teacher Preparation Pipeline STEM/CTE set out to create an inclusive and collaborative model of Teacher Preparation. The model of teacher preparation is intended to be both shared and replicated throughout the state and beyond. TPP STEM/CTE campuses work with each other and with non-TPP STEM/CTE colleges to provide opportunities for future teachers throughout the state.

## **SUMMARY OF INITIATIVE ACTIVITIES AND OUTCOME DATA**

Teacher Preparation Pipeline STEM/CTE was originally designed as a campus-by-campus program for future teachers. The initiative began during the 2006-2007 academic year and initially included 15 community colleges. Since the 2007-2008 academic year, TPP STEM/CTE has been comprised of 9-10 community colleges annually and has seen a drop in funding. The 2006-2007 funding levels for TPP STEM/CTE totaled \$4,100,000 for 15 campuses. The 2014-2015 funding level for TPP STEM/CTE totaled \$1,200,000 for 10 campuses. During the economic recession, teacher preparation started to go stagnant and workforce development efforts became more

focused on CTE industry sectors that showed greater need for workforce development and more promise for employment. Despite the decrease in funding and the economic recession, the Teacher Preparation Pipeline programs continued to recruit and train future teachers, though workforce opportunities for future teachers were becoming scarce.

The Teacher Preparation Pipeline STEM/CTE Collaborative has been observing teacher training and employment trends since 2006. Before the economic recession, TPP STEM/CTE anticipated a statewide teacher shortage due to massive upcoming retirements, updated legislative regulations (including No Child Left Behind), and major pedagogical shifts in California's schooling system (including the shift to Common Core State Standards). Further, funding for the initiative was due to sunset in 2014 at the same time the impending teacher shortage was looming. The Teacher Preparation Pipeline STEM/CTE initiative struggled to continue.

Throughout this time, the Teacher Preparation Pipeline STEM/CTE Collaborative determined that the silo approach to teacher preparation was not as effective as developing a regional and statewide model of teacher preparation that could be replicated throughout California and beyond.

Ultimately, continued support was granted by the California Community Colleges Chancellor's Office, which has been instrumental in the successful development of the restructured TPP STEM/CTE collaborative model of teacher preparation.

During the 2014-2015 academic year, the Teacher Preparation Pipeline STEM/CTE Collaborative positively impacted teacher preparation throughout the state in a variety of ways. A sample of success from the initiative is evident by quarterly reports that included such highlights as:

- 2,214 students engaged in coursework as a 1<sup>st</sup> point of interest for the Teacher Preparation Pipeline.
- Provided 3,478 community college students with teacher preparation resources throughout the state.
- 698 TPP STEM/CTE students participated in contextualized learning including fieldwork, Service Learning, internships or work-based learning.

- 553 students completed an education plan.
- Enrolled 388 high school students in concurrent or dual enrollment courses.
- Offered 78 Teacher Preparation Pipeline Career Awareness Activities designed for future STEM, CTE, K-12 and higher education teachers.
- Collaborated with K-12 and industry partners 73 times.
- Expanded to include 96 NEW partnerships with regional school districts and boards that provide opportunities for TPP STEM/CTE students.
- Partnerships include additional CSUs, UCs, private institutions, K-12 districts, industry, and ROP/CTE.
- Provided 89 professional development activities for K-12, community college faculty and counselors

As these 2014-2015 quarterly highlights showcase, the Teacher Preparation Pipeline STEM/CTE initiative enabled recruitment, training, and contextualized learning opportunities for future teachers throughout the TPP STEM/CTE regions. Continued investment in quality teacher preparation needs to be on the forefront of workforce development initiatives, as teaching is the one profession that directly impacts every other industry career pathway directly.

Ongoing and consistent funding for quality teacher preparation is a wise investment for the state of California. California's teaching workforce is dwindling and with expected retirements, the state will see a teacher crisis across the board, going beyond the current education workforce crisis areas of mathematics, science, Career Technical Education and special education. The time is now to invest in California's future teachers.

## **HIGHLIGHTS OF INITIATIVE ACTIVITIES**

The Teacher Preparation Pipeline STEM/CTE initiative has developed a collaborative model of teacher preparation that leverages regional and statewide resources to assist the next generation of California's teaching workforce. Through coursework, contextualized learning, professional development and ongoing advising, TPP STEM/CTE students learn early about the field of education, including workforce trends, teaching requirements, and incentives for those entering the teaching profession. Though the TPP STEM/CTE Collaborative works together with regional planning and statewide support for teacher preparation programs, The TPP STEM/CTE Collaborative continues to work with those within the TPP STEM/CTE network, to provide guidance, collaboration, support, and encouragement for non-TPP campuses that are looking to create or enhance their teacher preparation programs and resources.

TPP STEM/CTE programs across the state work regionally and statewide to enhance teacher preparation. Initiative highlights of the 2014-2015 academic year show the need to offer teacher preparation that is not a 'one size fits all' model, but instead adopt a *grow your own teachers* collaborative model that focuses on both statewide and regional needs in the field of education. TPP STEM/CTE offers and highlights regional specialized resources and opportunities for future teachers.

**HIGHLIGHT: Increased opportunities for career exploration to enhance the recruitment, development, and retention of future STEM teachers.**

California's future economic vitality depends on a highly skilled workforce but teaching is the one career sector that has never been holistically addressed, and that underpins all other career pathways. While there has been considerable discussion about the importance of preparing more students for STEM careers to meet anticipated demand, much less attention has been paid to the preparation of STEM teachers, who are crucial to the state's ability to educate future workers in STEM fields. California's demand for new math and science teachers in the next 10 years is expected to exceed 33,000, and the current rate of teacher preparation in the state cannot come close to meeting that need (The California State University, "Math and Science Teacher Initiative", [www.calstate.edu/teachered/msti/](http://www.calstate.edu/teachered/msti/)). TPP STEM/CTE campuses have developed a model of teacher preparation that emphasizes contextualized learning in the areas of STEM.

- **TPP SPOTLIGHT:** Grossmont-Cuyamaca strengthened teacher preparation programs in Region 10 by serving over 250 students with professional

development activities including online workshops and contextualized STEM curriculum. In addition, Grossmont-Cuyamaca sponsored a STEM Symposium in collaboration with SB1070 Health and Science Pipeline Initiative (HASPI) on contextualized chemistry.

- **TPP SPOTLIGHT:** City College of San Francisco offered or co-supported 24 sections of coursework: (Fieldwork/Internship classes, Intro to Education, CBEST/CSET prep, Special Education, etc.), for future teachers or those interested in exploring the teaching profession. City College of San Francisco offered 43 Supervised Fieldwork Placements and 5 work experience placements in San Francisco Unified School District classrooms.
- **TPP SPOTLIGHT:** Rio Hondo had forty-three students complete the (Teacher Education and Mentoring (TeAM) program and were exposed to the benefits of STEM teaching through Rio Hondo's mentoring program, internships and summer academy programs. The recruitment process focused on targeting students who were enrolled in STEM fields. Students served as teacher assistants and were given an introduction to the classroom under the guidance of an experienced STEM teacher mentor.



- **TPP SPOTLIGHT:** College of the Canyons hosted the Summer Institute, a junior high career exploration camp. TPP STEM/CTE students worked directly with faculty and industry leaders, while serving as classroom assistants. The Summer Institute included tracks in the areas of welding, architecture, robotics, allied health, sports medicine, and engineering.



- **TPP SPOTLIGHT:** West Hills Lemoore College conducted its 5C Experience (Creative, Cool, Community, College, Camp). The camp served 140 middle school students by bringing them into college classrooms, surrounding them with college mentors, and engaging them in a dynamic curriculum that was focused on STEM, career exploration, robotics, and academic success skills. 21 CTE-TPP-STEM college students served as mentors and teachers at the 5C Experience.

*For a video link about the 5C Experience, please visit:*  
[https://www.youtube.com/watch?v=mhDkmsQ\\_Aow](https://www.youtube.com/watch?v=mhDkmsQ_Aow)

**HIGHLIGHT: Innovative and contextualized STEM and CTE Career Exploration, Planning and Development**

- **TPP SPOTLIGHT:** Cerritos professional development and contextualized curriculum involved twenty-eight college faculty who participated in workgroups and either produced or assessed contextualized assignments and investigated common core standards. Two science faculty participated with two high school science teachers exploring the Next Generation Science Standards.
- **TPP SPOTLIGHT:** Cabrillo College has a partnership with an Outdoor Science Education program that supports low-income schools in the region; TPP STEM/CTE students worked with Outdoor Science Education as a new “entry point” to the teaching pathway.
- **TPP SPOTLIGHT:** El Camino College designed and produced three 2-minute promotional videos for the recruitment of future teachers. The three themes are:
  - *STEM (Science Technology Engineering Math) Teaching, call to action is, “Share your love of STEM by becoming a teacher.”*
  - *CTE Teaching, call to action is, “If you are a tradesman or professional, you can become a teacher of that trade or profession.”*
  - *General K-12 Teaching, call to action is, “You can become someone’s favorite teacher!”*

**HIGHLIGHT: Creating Contextualized Learning Environments and Training Opportunities for Current and Future Teachers**

- **TPP SPOTLIGHT:** During the 2014-2015 academic year, Cypress College TPP STEM/CTE future teachers completed approximately 8,000 fieldwork hours in K-12 classrooms. 27 TPP STEM/CTE students attended the Road to Teaching Conference at Santa Ana College. In addition, Cypress College hosts monthly huddles where future teachers discuss important themes, such as “Why teach?” and “What is good teaching?”
- **TPP SPOTLIGHT:** El Camino College has provided opportunities for partner high school instructors to attend a nearby professional development conference, the EdTechTeacher iPad Summit San Diego. Since 2012, EdTechTeacher has hosted events across the country and invited thousands of educators from around the world to collaborate and connect about how iPads are transforming education. At each iPad Summit, speakers share their knowledge and classroom experience through interactive, hands-on sessions.
- **TPP SPOTLIGHT:** Saddleback College has developed new partnerships with the intent of creating internship possibilities for our TPP students in STEM related areas. One example is the Marine Institute in Dana Point. Eight (8) students attended and completed applications for approximately 3 internships at the Dana Point Marine Institute beginning spring 2016, and possibly into summer 2016. Saddleback anticipates that the internship program will be successful and will become an ongoing opportunity for TPP students to be involved in hands-on STEM educational experiences.
- **TPP Spotlight:** Cypress College is currently working with the TPP collaborative to partner with Project Tomorrow, a national education nonprofit organization, through their YouthTEACH2Learn program. YouthTEACH2Learn is a career exploration program where students explore teaching as a career and allows students to gain practical experience by observing elementary school classrooms. Developing a concurrent/dual-enrollment component with this partnership will help all schools and colleges that are involved develop a teaching pathway that starts from the high school, connects to the community college, and eventually transfers to a 4-year university.

**HIGHLIGHT: Regionalization of efforts, resources and opportunities for future teachers**

- **TPP SPOTLIGHT:** City College of San Francisco has developed a community advisory committee, created a minor in Education, strengthened links between City College of San Francisco and San Francisco State University Metro Academy, shared recruitment events, offered a San Francisco State University class in Education at City College of San Francisco, shared Math Science Teacher Initiative recruitment data, and is advocating for San Francisco State University to re-authorize the CTE/Vocational Education credential. These types of efforts take collaboration, partnerships, and leveraging of resources. Through regionalization, these types of connections are able to develop and flourish.
- **TPP SPOTLIGHT:** Saddleback College has developed a model advisory board with key stakeholders within their region. Saddleback’s TPP STEM/CTE advisory team consists of 17 members, with regional representation including UC Irvine, CSU Fullerton, University of Redlands, Brandman University, University of La Verne, Concordia University, the Saddleback Valley Unified School District, Saddleback College and the Dana Point Marine Institute.
- **TPP SPOTLIGHT:** West Hills College Lemoore has impacted the Central/Motherlode region by working more directly with the CSU system, establishing a model of a “Careers in Education” pathway with a local high school partner that can now be replicated by other community colleges and high schools. The regionalization of TPP STEM/CTE has helped create a network of resources and expertise that can be utilized in the next few years as California responds to the pending teacher shortage in STEM, CTE, and all areas of education.
- **TPP SPOTLIGHT:** Cabrillo College has partnerships with local CSUs and UCs in creating and expanding service learning opportunities for students to fulfill requirements for undergraduate and credential requirements; all courses at Cabrillo articulate to both CSU and UC campuses in the Central Coast.

- **TPP SPOTLIGHT:** Grossmont-Cuyamaca College provided information on educational careers to more than 1000 community college students, and hosted a regional forum on *How to Educate Students about Careers in Education* in collaboration with Cal State San Marcos and San Diego State University credential specialists.
- **TPP SPOTLIGHT:** TPP STEM/CTE programs across the state are working more efficiently and expanding outreach through regional collaborations. TPP STEM/CTE is available to support neighboring colleges via technical assistance, teacher preparation start-up, and joint collaborations. We have expanded TPP STEM/CTE advisory boards to include more colleges, universities (public and private), K-12 school districts and industry leaders.

**HIGHLIGHT: Developing innovative professional development for 21<sup>st</sup> Century teachers: The shift towards Common Core State Standards and Next Generation Science Standards**

- **TPP SPOTLIGHT:** Rio Hondo College incorporated game-based learning theory into some of their summer activities; faculty participants were introduced to Mathcraft, a Common Core Math curriculum centered on a popular digital game, Minecraft. Teachers built, solved, and aligned Common Core Standards in Minecraft and learned to develop their own lesson plans and manage a digital game-based classroom.



- **TPP SPOTLIGHT:** TPP STEM/CTE colleges conducted hands-on STEM and CTE career exploration summer programs and activities. For example, Cerritos College conducted a Summer STEM Academy; college participants took an Earth Science course in the morning and then team-taught hands-on Common Core STEM activities to 200 middle school students in the afternoon.

## HIGHLIGHT: Teacher Preparation Pipeline STEM/CTE Focuses on Student Success

- **TPP SPOTLIGHT:** At Cerritos College, 430 high school seniors participated in the new K-16 Bridge to College initiative and completed the college's mandatory matriculation process. Nine (9) parent information evening workshops were held emphasizing CTE, STEM and the teaching pathway. 133 students identified a career interest in teaching, CTE and STEM. All incoming students completed mandatory assessment, orientation and counseling and have an education plan. 110 students applied and were accepted to Teacher TRAC last year.
- **TPP SPOTLIGHT:** College of the Canyons TPP STEM/CTE future teachers have developed a club specifically for those who wish to be leaders in the field of education. The club meets monthly and has been basing their discussions, guest speaker topics, and their spring 2016 Leadership Academy on the introductory leadership text, *7 Habits of Highly Effective Individuals*. Student leaders worked directly with TPP STEM/CTE staff and faculty in 2014-2015 to gain additional grant funding to support this initiative and to jump start the leadership club. Students in the leadership club participate in targeted events, where they are presented with opportunities to network with education leaders, including politicians, regional business leaders, K-12 superintendents, assistant superintendents, principals, and other key players in education.



*TPP STEM/CTE Students and staff with Santa Clarita Valley Councilwoman Marsha McLean*

- **TPP SPOTLIGHT:** TPP STEM/CTE directors met in Sacramento in fall 2015 for two days to engage with key stakeholders and initiatives from the Chancellor's Office and to develop relationships with industry partners, such as Project Tomorrow.

**Highlight: CTE success through designated subject credentials**

- **TPP SPOTLIGHT:** Through a partnership with Rio Hondo and the Los Angeles County Office of Education, 7 new and current CTE teachers are taking the required classes for the Designated Subjects Credential to obtain their preliminary and clear credential in CTE.
- **TPP SPOTLIGHT:** Through El Camino College’s TPP STEM/CTE program, at least 40 future teachers have been supported in obtaining their teaching credential in various STEM and CTE fields. These individuals have been supported by TPP staff’s hands-on assistance, specifically in the area of Designated Subjects Credentials.

The table below represents El Camino College’s success with credentialing in CTE credentials, Designated Subjects credentials and Single Subject credentials. The left side of the table specifies the number of people obtaining the credential that is listed and the title of each credential. The middle column represents the status of each credential sought and the right three columns showcase the specific credential(s) obtained by TPP STEM/CTE students at El Camino College. The TPP STEM/CTE Collaborative works together to support credentialing throughout various regions of the state, with an emphasis on high demand credentialing, including CTE, STEM, higher education, and K-12 education.

**EL Camino College TPP STEM/CTE Credentialing Success**

#	Certificate Title	Term	Credential 1	Credential 2	Credential 3
1	Career Technical Education Teaching Credential	Clear	Transportation		
3	Career Technical Education Teaching Credential	Preliminary	Arts, Media, and Entertainment		
1	Career Technical Education Teaching Credential	Preliminary	Arts., Media, and Entertainment	Marketing, Sales, and Service	Finance and Business
9	Career Technical Education Teaching Credential	Preliminary	Building and Construction Trades		
1	Career Technical Education Teaching Credential	Preliminary	Engineering and Design		
1	Career Technical Education Teaching Credential	Preliminary	Hospitality, Tourism, and Recreation		

#	Certificate Title	Term	Credential 1	Credential 2	Credential 3
4	Career Technical Education Teaching Credential	Preliminary	Transportation		
1	Designated Subjects Adult Education Teaching Credential: Full Time	Clear	Building and Construction Trades	Performing Arts	
1	Designated Subjects Vocational Education Teaching Credential: Full Time	Clear	Auto Mechanics		
1	Designated Subjects Vocational Education Teaching Credential: Full Time	Clear	Business Office Occupations	Distributive Occupations	
1	Designated Subjects Vocational Education Teaching Credential: Full Time	Clear	Printing and Graphics Occupations		
1	Designated Subjects Vocational Education Teaching Credential: Full Time	Preliminary	Auto Mechanics		
1	Full Time Designated Subjects Career Technical Education Teaching Credential	Clear	Arts, Media, and Entertainment	Building Trades and Construction	Engineering and Design
2	Full-time Designated Subjects CTE Teaching Credential	Clear	Building Trades and Construction		
1	Full-time Designated Subjects CTE Teaching Credential	Clear	Transportation	Manufacturing & Product Development	
1	Full-time Designated Subjects CTE Teaching Credential	Preliminary	Transportation		
1	Single Subject Teaching Credential	Clear	Industrial and Technology Education	Art	
6	Single Subject Teaching Credential	Clear	Industrial and Technology Education		
1	Single Subject Teaching	Clear	Science: Physics	Science:	Science:

#	Certificate Title	Term	Credential 1	Credential 2	Credential 3
	Credential		(Examination)	Chemistry (Examination)	Biological Sciences (Examination)
1	Single Subject Teaching Credential	Clear	Social Science (Examination)		
1	Single Subject Teaching Credential	Preliminary	Social Sciences (Examination)	Introductory English as a Second Language	

At least 7 additional future teachers have been assisted in gaining their teaching credential in other areas:

#	Certificate Title	Term	Credential 1	Credential 2
1	Multiple Subject Teaching Credential	Clear	Art	General Subjects
1	Multiple Subject Teaching Credential	Clear	General Subjects (Examination)	
1	Single Subject Teaching Credential	Clear	Art	
2	Single Subject Teaching Credential	Clear	Business (Examination)	
1	Single Subject Teaching Credential	Clear	Foreign Language: Spanish	
1	Single Subject Teaching Credential	Clear	Home Economics	

**HIGHLIGHT: Developing and refining a new model of collaborative teacher preparation throughout the state of California and beyond.**

The most impactful work done during the past year that has enhanced the mission of all TPP colleges has been the collaboration of the 10 TPP colleges and their focus on developing and expanding teacher preparation across regions. Prior to the 2014-2015 academic year, TPP STEM/CTE colleges met on a semi-regular basis and worked cooperatively, but this past year moved the group from cooperation to collaboration. Evidence of this includes monthly meetings, initial development of regional resources and a TPP STEM/CTE website, attendance and presentations at the California Community Colleges Association for Occupational Education (CCCAOE) in both spring and fall 2015, and consistent interactions with the California Community College Chancellor's Office. College resources were further developed with focus on

development of regional resources including pamphlets, videos, and other design elements to showcase all TPP resources and regional work that has been accomplished. This work is on-going and will include a new Teacher Preparation Pipeline STEM/CTE website, designed to be a resource for those interested in quality teacher preparation.

- **TPP SPOTLIGHT:** In Fall 2015, the TPP STEM/ Collaborative held a regional day of professional development at Cerritos College. The event included 6 TPP STEM/CTE Colleges, 6 other Community Colleges, 3 Universities, 4 high schools, 1 Regional Occupation Program, additional CTE sectors, and TPP faculty, staff, and students.
- **TPP SPOTLIGHT:** TPP STEM/CTE directors collaborated for the Spring 2015 CCCAOE conference in Northern California where the team showcased their collaborative efforts through a display and information table. The TPP collaborative also presented at the Southern California Fall 2015 CCCAOE conference on *Preparing the Pipeline of CTE and STEM Teachers*. The presentation led to contacts with other colleges in the state who are interested in developing teacher preparation programs.

### **MOVING FORWARD: TACKLING STUBBORN CHALLENGES**

It is essential that teacher development activities initiated and funded by the CCCC allow time for pipeline completion. Multi-year and continued funding is essential as students interested in teaching need time to gain field experience, explore options, gain required coursework, and increase knowledge related to the very complicated credentialing system. Future CTE teachers are subjected to a convoluted morass of requirements related to a wide variety of specialty areas, teaching credential discrepancies and complications. Some CTE area teachers need an MA/MS degree, others need a single subject credential and others need an AA with 6 years of industry experience depending on the hiring institution and the venue. These differences need to be articulated to students and staff.

Additionally, the concept that there is a pipeline is a misnomer. No two community college students follow the same pathway to teaching. Some were prepared in high school; others were not. All TPP STEM/CTE students need individual advising and educational plans. Community college students are career-changers, degree holders, high school students, re-entry students, foreign students and displaced workers. They all have academic and professional histories that contribute to their pathway. Teacher preparation pathways in a community college are more like elevators, where students

can enter and exit depending on their needs.

Teacher recruitment efforts are often centered at the CSU/UC or 4 year – college level and specifically on recruitment during the junior and senior year of college. Partnerships in teacher preparation are often uneven. Human Resources Departments have noticed a decline in teacher applicants over the past ten years. Outreach is done to credential programs with 4-year colleges and universities as primary partners. Little attention or funding is provided to retain credentialed teachers about to leave the field, encourage credentialed teachers that left to return, and to develop local future teachers at the community college and high school levels. The majority of teacher recruitment funding is spent on short-term strategies. High turnover among recruiters translate into the same solutions being applied year after year, with minimal results. That strategy is shortsighted, as students often develop career goals early in their high school or college careers and utilize employment with youth programs, internships and fieldwork to solidify their goals. California has not yet engaged in long-term and long-range teacher development starting from high school or middle school and beyond. This is the wave of the future. Opportunities to work with K-12 districts on contextualized learning are starting to emerge, but the need to increase opportunities and resources for future teachers is evident.

**CHALLENGE: State policies create barriers for future teachers**

States and school districts tend to approach teachers from a one-size-fits-all perspective that inhibits efficient and productive teacher workforce management. The current practices of professional development and accountability lack differentiating developmental paths for teachers. A major disconnect persists between what research shows, what policies promote, and what teachers do.

Additionally, K-12 faculty and community college faculty often speak different languages. The K-12 common core content standards that dictate the curriculum of the K-12 teacher are unknown to most community college instructors. Creating a shared language and vision for instruction takes time and effort. To add even more complications, pedagogy is not a required component of community college instructor preparation. As faculty engage in dual-enrollment and shared enrollment efforts, community college faculty will need instruction on how to teach high school students, as well as adults with varying needs in mixed age classrooms.

**CHALLENGE: Recruitment and retention of teachers in high-need subjects is lacking**

Teacher needs of specific schools vary, therefore equitable access to qualified teachers is challenging. Additionally, recruitment and rebranding is important in building a California optimal teaching pool, the teaching profession must be rebranded as valued and respected.

At West Hills College Lemoore the T.E.A.M. Teach program changed their recruiting approach in 2014-2015 to connect with high school students prior to them registering at the college. Recruitment for the new future STEM teachers occurred throughout the spring semester with the end result being students registering at the Eagle Dayz 2015 event for incoming freshman in April. West Hills College Lemoore hosted 550 high school seniors and 75 of them identified an interest in joining the T.E.A.M. Teach program. The program advisor followed up with the interested students and identified STEM-TPP students to add to our 2014-15 cohort. Taking a proactive approach to recruitment is one way to combat the challenge of future teacher recruitment.

The TPP STEM/CTE team encourages more high school teachers and administrators (and other high school support services) become involved in the planning and implementation of region-wide teacher training/preparation programs for students. These are the people on the “ground floor” when students are beginning the exploratory process for careers and can have a great deal of influence in supporting students in career exploration, particularly in relation to teaching careers. If high school personnel were more involved in the program planning and processes, there would be a potentially seamless transition from high school, to college, to teaching (or other careers in Education).

**CHALLENGE: Credentialing requirements**

With the implementation of Common Core State Standards at the K-12 level, it is essential that community college faculty understand the underlying theories and goals of the Common Core State Standards and learn to integrate these standards into shared courses. Additionally, TPP STEM/CTE programs would like to ensure that future teachers have opportunities to become familiar with Common Core State Standards and Next Generation Science Standards early within their teacher preparation, in order to gain a deeper understanding of the pedagogy and cultural shifts within the field of education.

It is also essential to market the pathway of education as a statewide workforce priority where one can share credential and education requirements, and incentive programs

intended to lessen the teacher shortage in California. The career of teaching will need to be marketed as a viable career pathway where those interested have opportunities for both professional growth and development, while earning a livable wage.

**CHALLENGE: Developing ongoing individualized contextual experiences and opportunities for the variety of teachers trained by TPP programs.**

Developing individualized contextualized experiences and opportunities involves a steep learning curve that can be hard not only on students, but also on teachers themselves. Mentoring is not enough for new teachers; they struggle with classroom management, a lack of guidance and resources for lesson. New teachers need a scaffold approach that includes mentoring and guidance with other colleagues.

Although TPP campuses have a number of students who are engaged in job shadowing, tutoring, and working in after-school programs in TPP regional K-12 districts, it can be challenging to formalize Memorandums of Understanding (MOUs). There are no specific objections to formalizing MOUs, but it has been a lengthy process as it includes numerous approvals in both the K-12 and community college system. This is one barrier to developing opportunities for contextualized learning experiences.

**CHALLENGE: Securing sufficient and ongoing funding to meet workforce needs**

Current funding of SB1070 California Teacher Preparation Pipeline/STEM-CTE for the 10 TPP STEM/CTE campuses provides part-time staff resources to facilitate TPP STEM/CTE programs. The TPP STEM/CTE Collaborative suggests that increased investment in the current 10 TPP STEM/CTE campuses, plus the opportunity to expand to additional campuses throughout the state, be the model of teacher preparation moving forward. Without an increase of funding, TPP STEM/CTE cannot effectively help diversify, produce high quality teacher training programs to include teachers of color to create a California optimal pool of teachers. Increased, ongoing funding that provides the opportunity to expand, will best meet the needs of the upcoming teacher shortage and for the continual need for quality teachers for the state.

The Teacher Preparation Pipeline STEM/CTE program proposes ongoing support to regions that develop and encourage most effective practices in teacher preparation. The goal of this proposal is to provide a picture of what measurable objectives, targeted activities and program approaches have been most successful in developing qualified teachers within STEM, CTE, K-12, and Higher Education.

The TPP STEM/CTE Collaborative is strong, and TPP campuses are in constant communication and collaboration, even though the 10 TPP campuses are situated in regions throughout the state. We have been marketing TPP STEM/CTE programs and activities, in conjunction with the other TPP programs in California; sharing best/effective practices and forming a model for teacher preparation programs; and offering activities and events that can be duplicated throughout the state and country.

*If you would like additional information about Teacher Preparation Pipeline STEM/CTE initiative or the TPP STEM/CTE Collaborative, please contact TPP lead, Renee Marshall at [Renee.Marshall@canyons.edu](mailto:Renee.Marshall@canyons.edu)*

**TEACHER PREPARATION PIPELINE/STEM/CTE  
PROGRAM DIRECTORS**

<p>Renee Marshall          TPP STEM/CTE Director          Santa Clarita CCD/College of the Canyons          26455 Rockwell Canyon Road          Santa Clarita, CA 91355          661-362-3731  <a href="mailto:Renee.Marshall@canyons.edu">Renee.Marshall@canyons.edu</a></p>	<p>Bobby Becka, Director          Grants Development &amp; Management          El Camino College          16007 Crenshaw Boulevard          Torrance, CA 90506          (310) 973-3134  <a href="mailto:rbecka@elcamino.edu">rbecka@elcamino.edu</a></p>
<p>Tonette Salter, Program Coordinator          Teacher Preparation Pipeline          Grossmont-Cuyamaca CCD          900 Rancho San Diego Parkway          El Cajon, CA 92013-4304          619-660-4729  <a href="mailto:tonette.salter@gcccd.edu">tonette.salter@gcccd.edu</a></p>	<p>M. Lea Martinez          CTE-Teach Project Director          Rio Hondo College          3600 Workman Mill Road          Whittier, CA 90601-1616          562-463-3152  <a href="mailto:lmartinez@riohondo.edu">lmartinez@riohondo.edu</a></p>
<p>Orlantha Nin.          Transfer Center Coordinator/Counselor          Saddleback College          28000 Marguerite Parkway          Mission Viejo, CA 92692-3635          (949) 582-4328  <a href="mailto:onin@saddleback.edu">onin@saddleback.edu</a></p>	<p>Sue Parsons          Director/Educational Partnerships and          Programs/Teacher TRAC          Cerritos College          11110 Alondra Boulevard          Norwalk, CA 90650          562-860-2451x2671  <a href="mailto:parsons@cerritos.edu">parsons@cerritos.edu</a></p>
<p>James Preston          Dean of Educational Services          West Hills College Lemoore          555 College Avenue          Lemoore, CA 93245          559-925-3146  <a href="mailto:jamespreston@whccd.edu">jamespreston@whccd.edu</a></p>	<p>Mary Soltis, Coordinator and Instructor,          TPP-STEM/CTE HASS Division.          Cabrillo College          6500 Soquel Drive          Aptos, CA 95003-3119          831-588-6415  <a href="mailto:masoltis@cabrillo.edu">masoltis@cabrillo.edu</a></p>
<p>Keith Vescial          CTE Teacher Prep Director          Cypress College          9200 Valley View Street          Cypress, CA 90630-5897          714-484-7000x48506  <a href="mailto:kvescial@cypresscollege.edu">kvescial@cypresscollege.edu</a></p>	<p>Kathleen White          Dept. Chair/Teacher Prep Coordinator          San Francisco City College          50 Phelan Avenue, MUB 247          San Francisco, CA 94112          415-239-3891  <a href="mailto:kwhite@ccsf.edu">kwhite@ccsf.edu</a></p>

