

SPARK into Pathways – CaMSP Grant



Program Goals

SPARK Into Pathways has the following specific goals:

1. Increased math-related academic performance among students by using Project- based Learning units and integrating Engineering and Technology
2. Increased knowledge among Fresno State faculty regarding strategies to provide effective STEM Project-based instruction Professional Development for K-8 teachers
3. Increase in the effective use of technology as an educational tool and to communicate with the SPARK Community of Practice (COP).
4. Create a cohort of highly trained STEM Teachers, who will assume STEM leadership roles in the PUSD, region, and state.
5. Equip teachers with the skills and knowledge to motivate their students to consider a STEM- related career path, including increasing the number of girls, underrepresented youth, and those with special needs interested in pursuing STEM secondary/postsecondary coursework and careers
6. Increased K-8 teacher retention and overall commitment to success in education.

The **SPARK Into Pathways** (SPARK) project is a Cohort 13 partnership funded by the California Mathematics and Science Partnership (CaMSP) program, which is administered by the California Department of Education's Science, Technology, Engineering and Mathematics (STEM) Office. CaMSP is a federally funded initiative of the US Department of Education's Mathematics and Science Partnership (MSP) Program under Title II of the Elementary and Secondary Education Act (ESEA).

Introduction

SPARK included a target of 65 participating mathematics and science teachers in grades K to 8, serving approximately 14,116 students. The lead school district for this partnership (Lead LEA) is Porterville Unified School District (PUSD), which is partnering with California State University Fresno (CSUF) School of Engineering and the Kremen School of Education; San Joaquin Valley Mathematics Project (SJVMP); Tulare County Office of Education (TCOE); the Ed Tech Team; and Project Lead the Way (PLTW).

The purpose of SPARK is to give classroom teachers the knowledge and skills needed to teach mathematics and STEM education in a new and exciting way. SPARK teachers participated in:

- 60 hours of intensive content and pedagogical instruction during a 4-day summer institute Two Super Saturdays (12 hours),
- Three evening meetings and an end-of-year showcase (10 hours), and
- Multiple Read and Respond assignments
- Two Model Lesson Cycles (7.5 hours), that included an observation of a model lesson, debrief and submission of a personal growth plan via Google Classroom (10 hours),
- Teach and Reflect Assignments (6 hours),
- Grade alike team meetings during the evening meetings
- End-of-Year SPARK Exhibition

Partnership Impact



Based on information collected through the Public Works local evaluation, the following strengths and impacts of the program partnership's work have been identified to date:

- PUSD continues to have a strong relationship with Fresno State
- PUSD has leveraged existing district programs to further their CaMSP project goals.
- Project teachers value the integration of technology into the project with the support of the district for hardware and software needs.

Teacher Findings



CaMSP Spark into Pathways:
Teacher Portfolio/Google Classroom Activities

Topic	4 Superior	3 Adequate	2 Marginal	1 Limited
Completeness of the Portfolio 16-17 <ul style="list-style-type: none">★ Teach and Reflect★ Read and Respond★ Evening Meeting Reflections★ Super Saturday Reports★ Model Lesson Observations★ End of Year Exhibition (Sp only)	All required portfolio activities are completed and include photos, student samples, and/or lesson plans to support reflections and reports	All required portfolio activities are completed	3 activities completed	1-2 activities completed
Quality of the Product Teach and Reflect	Addresses the lesson clearly and responds effectively to all aspects of the task.	Addresses the lesson clearly, but may respond to some aspects of the task more effectively than others.	Addresses the lesson, but may slight some aspects of the task.	Neglects aspects of the lesson and/or task.
Quality of the Product Read and Respond	Demonstrates a thorough understanding of the assigned reading in developing an insightful response.	Demonstrates understanding of the assigned reading in developing a well reasoned response.	Demonstrates a general understanding of the assigned reading in developing a sensible response.	Demonstrates some understanding of the assigned reading, but makes limited use of it and/or develops a minimal response.
Quality of the Product Evening Meeting Reflection	Explores the issues discussed with the Grade Level Team thoughtfully and in depth.	Shares the issues discussed with the Grade Level Team clearly and with detail.	Explains the issues discussed with the Grade Level Team with some detail.	Provides some of the issues discussed with the Grade Level Team with little to no detail.
Quality of the Product Super Saturday Reports	Addresses the task clearly and responds effectively to all aspects of the assignment.	Addresses the task clearly, but may respond to some aspects of the assignment more effectively than others.	Addresses the task, but may slight some aspects of the assignment.	Neglects aspects of the assignment.
Quality of the Product Model Lesson Observations	Observes the lesson thoughtfully and in depth and responds effectively to all aspects of the task, including a thorough and insightful personal growth plan.	Observes lesson clearly and with detail but may respond to some aspects of the task more effectively than others, including a well reasoned personal growth plan	Explains observed lesson with some detail but may slight some aspects of the task, including a sensible personal growth plan.	Provides some of the observed lesson with little to no detail and may neglect aspects of the task, including a limited/minimal personal growth plan.
Quality of the Product End of Year Exhibition	Display is coherently and professionally organized and developed, with insights on new learning supported by well chosen and a variety of examples, including demonstration.	Display is well organized and developed with reasonable professionalism, with thoughts on new learning supported by appropriate examples that may include demonstration.	Display is adequately organized and developed, generally sharing new learning with few examples.	Display has limited organization and development, providing little to no examples of new learning.

*Adapted from the EPT, CSU Expository Reading and Writing Task Force

Measuring Project Impact on Teachers mid-year: Teacher findings included in this section are based on analysis of data collected using several different evaluation tools including feedback surveys, a teacher efficacy survey and teacher portfolios: Some of the mid-year findings included:

- Teachers rated 2016 summer institute PD good overall. The majority of teachers reported that they intend to implement new strategies learned into their classrooms, that the PD elevated their enthusiasm for teaching math, science or STEM, and the training increased their interest in establishing a PLC at their school.
- On their initial Teacher Efficacy survey, most teachers felt confident they can effectively use mathematical thinking and practices, group students to develop collaboration skills, and are confident using real-life situations to introduce students to new concepts.
- The majority of teachers scored adequate or superior on assignments included in their Teacher Portfolio. Assignments included viewing Ted Talk videos and writing a reflection, reflecting on lessons taught and writing a summary report for their Super Saturday/Google Summit.
- Results from the Coaching Program survey reveal that coaches felt lesson study groups were knowledgeable about various types of technology and seemed comfortable incorporating digital resources; Strengths noted in the survey included teachers having a strong understanding of essential questions, are able to develop strong student collaboration, and are eager to learn new skills and try out new ideas.
- At November 2016 Super Saturday, teachers were provided PD on using Google apps in their classrooms including Google Drive, Google Classroom, and third party apps. They also worked in grade-level groups to review goals established earlier in the project and their next steps.