



CAL POLY POMONA INTENTIONAL VENTURE ENGAGING STEM STUDENTS (CPP INVESTS)

California State Polytechnic University, Pomona (CPP)

SUPPORTED BY THE NATIONAL SCIENCE FOUNDATION

AWARD #2122567



YEAR 1 EVALUATION REPORT

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Submitted by
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EXECUTIVE SUMMARY

Funded by The National Science Foundation (NSF; #2122567), **Cal Poly Pomona Intentional Venture Engaging STEM Students (CPP INVESTS)** project aims to enhance the quality of undergraduate STEM education and the recruitment, retention, and graduation of STEM students at California State Polytechnic University, Pomona (CPP) by expanding student pathways to continued STEM education and integration into the STEM workforce. Cobblestone Applied Research & Evaluation, Inc. (*Cobblestone*) is conducting the external evaluation of the CPP INVESTS project. This formative evaluation report provides a summary and analysis of the first year of program implementation (September 1, 2021 to August 31, 2022).

Program Activities

To achieve program goals (broaden the number of STEM students participating in well-known high impact practices [HIPS]; develop and implement Alternative Learning Records [ALRs]; provide STEM faculty professional development [PD] opportunities), CPP INVESTS implements five activities during critical transitions in the STEM student life cycle:



Activity 1
First Year
Experience (FYE)



Activity 2
Course-based
undergraduate
experience
(CUREs)



Activity 3
Micro-
internships



Activity 4
Alternative
Learning
Records (ALRs)



Activity 5
Faculty
Professional
Development

STEM Education Research






In addition to the above program activities, the following research questions will be addressed to advance knowledge in the field of STEM education:

- RQ1: What is the impact of peer mentoring experience of first time first year STEM students on their sense of belonging and academic self-efficacy?
- RQ2: How do ALRs and micro-internship experience contribute to students' professional identity over and above their STEM identity?

Program Evaluation

CPP INVESTS is being evaluated using a mixed-methods design which combines qualitative and quantitative indicators to answer implementation and outcome evaluation questions. A *formative evaluation* occurred in Year 1 to determine the extent to which CPP INVESTS activities were implemented with fidelity and high quality, assess initial outcomes, and provide stakeholders with ongoing performance feedback. A variety of methods were used to answer evaluation questions in Year 1, including: faculty surveys; document and artifact analysis; and communication with the CPP INVESTS leadership team.

Year 1 Key Findings & Recommendations

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|  <p>First Year Experience</p> | <p>The first semester of the CPU 4990: Peer Mentoring course was implemented and trained 14 project learning assistants who will be embedded in FYE courses in fall 2022. A total of eight faculty members participated in the spring 2022 FYE faculty learning community. One new FYE course was developed for the College of Science: SCI 1010/1010A and SCI 1020A.</p> |
|  <p>Course-Based Undergraduate Experiences</p> | <p>CPP INVESTS expanded its work beyond CUREs to also include course-based authentic learning experiences (ALEs). While a CURE produces research results that are new to the field, an ALE produces results that are new to the student but not the field. A baseline survey of faculty found that 64% reported implementing CUREs in their courses.</p> |
|  <p>Micro-Internships</p> | <p>The existing Parker Dewey platform was identified to host the micro-internship clearinghouse. The first CPP INVESTS micro-internship will be piloted in a College of Agriculture course in fall 2022, partnering with the Community Alliance of Family Farmers.</p> |
|  <p>Alternative Learning Records</p> | <p>The development of two pathways comprised of two badges each is underway. The Research pathway will include information literacy and problem-solving badges. The Professional Readiness pathway will include teamwork and communication badges.</p> |
|  <p>Faculty Professional Development</p> | <p>A total of 25 STEM faculty members attended the three-day Summer Conference that included CURE, FYE, and community-engaged learning (CEL) tracks. There were also plenary sessions on Inclusive Excellence. In fall 2022 the first group of faculty members will participate in the USC Equity Institute.</p> |

STEM Education Research

Activities related to RQ1 are underway. A research assistant was hired and completed a literature review on mentoring. The FYE student survey was developed and includes published constructs with high internal reliabilities. Challenges, including lack of clarity around delegation of responsibilities and study design, hindered course recruitment for the study. In fall 2022, six STEM FYE sections will participate as part of the treatment group and there will be no control group.

Recommendations and Next Steps for Year 2:

- Ensure distinction between CUREs and ALEs
- Increase awareness of ALR benefits
- Continue to provide PD on CUREs, FYE, CEL
- Establish and communicate clear STEM education research design (written document)
- Begin RQ1 FYE course recruitment earlier
- Ensure integrity of original project design