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

California State Polytechnic University, Pomona (CPP)

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YEAR 2 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 second year of program implementation (September 1, 2022 to August 31, 2023).

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 2 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 2, including: student surveys; document and artifact analysis; and communication with the CPP INVESTS leadership team.

Year 2 Key Findings

First Year Experience	A total of three new CoS FYE courses have been developed and the second FYE FLC was held in spring 2023. While targets for PLAs trained and placed are slightly below Year 2 goals, this is due in part to the limited number of STEM FYE courses implementing PolyX. STEM PLA recruitment efforts have improved from Year 1.
Course-Based Undergraduate Experiences	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. The CUREs and ALEs FLC was held in spring 2023 with the expectation that participants will implement a CURE or ALE in Year 3.
Micro-Internships	Two micro-internship pilots were held serving a total of 15 students. CPP has secured additional funding to expand micro-internships at nonprofit organizations in subsequent years.
Alternative Learning Records	A digital badging advisory board was formed to determine competency badge criteria and approve the implementation of the badges in qualifying courses. Criteria for the information literacy badge have been established and the teamwork, problem solving, and communication badges remain under development.
Faculty Professional Development	Two cohorts participated in the USC PD. While the target number of 20 STEM faculty were recruited to participate, 14 ultimately completed the PD. The Winter 2023 Institute was held focusing on digital badging. The Summer 2023 Conference included tracks related to FYE, digital badging, and mentoring.

STEM Education Research

Research occurred related to RQ1 (FYE) and RQ2 (micro-internships). Five treatment FYE sections were surveyed in fall 2022; there was no control group. Data are expected to be analyzed and findings reported in Year 3. A focus group was held with the KIN 4602 micro-internship participants at the end of spring 2023. Focus group findings indicate that the micro-internship increased students' confidence in pursuing their career and provided them with a sense of purpose. RQ2 research related to ALRs will be modified in response to the nature of ALR implementation.

Recommendations and Next Steps for Year 3:

- ☐ Continue to recruit STEM PLAs and FYE faculty members early
- ☐ Follow-up with FLC members to monitor CURE and ALE implementation
- ☐ Award information literacy badges
- ☐ Implement peer coaching program with USC PD participants
- ☐ Determine feasibility of control group for RQ1 and ALR component of RQ2 and modify plan accordingly
- ☐ Ensure integrity of original project design