Project Goals

This project integrates three key high impact practices proven to be successful for improving under-represented minorities (URM) and first-generation status (FGS) student success at Fresno State: a summer experience, a common first-year experience (FYE), and courses redesigned to incorporate active and collaborative learning strategies. Our project targets the following outcomes:

1. Increase student awareness of campus resources.
2. Improve self-efficacy and sense of belonging.
3. Improve student learning outcomes in critical thinking and quantitative reasoning.
4. Improve student success, measured by introductory course pass rates, major and university GPAs, as well as major and university retention rates.
5. Use of interdisciplinary, problem-based sustainability-themed modules in core introductory courses (outside of the FYE).

Institutional Context

California State University, Fresno (Fresno State)
- Students drawn primarily from Central California’s agriculture-rich San Joaquin Valley.
- 23,000 undergraduate, graduate and post-baccalaureate students.
- Since 2002, steady increase in URM (50% in 2011), FGS (72% in 2011) and Pell Grant eligible students (63% in 2011).
- Hispanic Serving Institution (46% Hispanic students).
- Asian American and Native American Pacific Islanders-serving Institution (15% Asian American, of whom 34% Hispanic).

College of Science and Mathematics (CSM)
- 3,300 undergraduate students; over 300 post-baccalaureate and graduate students.
- 100 tenured/tenure-track faculty, 80 part-time faculty, and 30 staff.

Project Coordinator

CSM Student Peer Leaders

Whitney Menefee

Peer Leaders: Summer Experience & Learning Assistants (PFL counsellors)

Fresno State College of Science & Mathematics First Year Experience (FYE)

Participants: Roles & Responsibilities

Principal Investigator

Andrew Lawson

Dean and CSM

Jai-Pil Choi

ARC Director

Madhu Katti

Faculty Learning Community

Research: group inquiry-based activities for Summer Experience, FYE course content, and sustainability modules for other introductory CSM courses.

SupportNet: early warning system for students at risk of failing courses.

E-portfolios: Pathrbright, adopted university-wide for demonstrating GE.

Project Assessment & Evaluation

Project Outcome Measures

1. Student awareness of campus resources: pre/post awareness and participation.
2. Self-efficacy and Sense of belonging: pre, post, Summer, post CSM10, post CSM15 surveys.
3. Critical thinking and quantitative reasoning learning outcomes: student work documented in e-portfolios, coded to learning outcomes.
4. Course pass rates: major and university GPAs, major and university retention rates: analysis and long-term tracking using campus database.
5. Use of interdisciplinary, problem-based sustainability-themed modules in core introductory courses: instructor surveys and peer observations.

Synergies & Future Work

This project is aligned with and will create synergies with existing efforts in the College, namely the NSF WIDER funded faculty-led course re-design project and CSM Advising and Resources Center, a larger university-wide initiative such as SupportNet and CSU STEM Collaboratives. As well as the University’s commitment to and active discussion of measures of student success.

Funding & Support

ACLU Diversity, Latino and Baccalaureate, and University Office for Diversity and Inclusion.

AAGUA Institute on High-Impact Practices and Student Success.

CSU Collaborative Grant, sponsored by the Helmsley Trust.

College of Science and Mathematics.

CSU Advising and Resources Center.

Existing Programs and Initiatives

University-wide

-Summer Bridge (2014: 200 incoming freshmen).
-First Year Experience (100% at-risk, first generation students with block scheduling). 29 equivalent blocks.
-Supplemental Instruction (weekly Peer-led sessions outside of class).
-SupportNet: early warning system for students at risk of failing courses.
-EDP: Pathrbright, adopted university-wide for demonstrating GE.

CSM targeted efforts

-Science Scholars Learning Community.
-Science Scholar: Peer Learning Facilitator Learning for Outcomes Knowledge, faculty learning communities, redesign of key intro. CSM courses (8 courses, 26+ faculty).
-LAMP: increase STEM graduation rates (186 students, 32 freshman).

Fresno State College of Science & Mathematics First Year Experience (FYE)

Tentative Schedule

**Student Success Workshop & Activities**

- Scavenger Hunt to purposely search for academic resources (e.g., find your classroom, library book, textbook, research papers).
- Critical Thinking: Evidence-Based Decision Making. Topics include uncertainty, significance, trends, and causality.
- Direct support for FYE, liaison for all CSM incoming freshmen.
- Significant gaps in persistence, graduation rates, and first-year retention rates between URM students and their white peers.

CSM10: The Scientific Method (GE Area A3 – Critical Thinking)

Application of the scientific method to locally-relevant problems and challenges, including the evaluation of inductive and deductive arguments coupled with the evaluation of experimental data to develop test scientific hypotheses.

Learning Outcomes

- Use inductive reasoning to form sound scientific hypotheses that show conceptual understanding based on experimental data.
- Use deductive reasoning to predict expected experimental observations based on a scientific hypothesis.
- Evaluate observations and experimental data to determine if a hypothesis is supported or refuted by an experimental result.
- Critically evaluate the validity of inductive and deductive reasoning and data interpretation appearing in the scientific literature.
- Use cause-effect chains to support a reasoned explanation of experimental observations.

Incorporative Case Study: COFFEE

- small research groups (3-4 students)
- study environmental, social, and economic impacts of single-use coffee pods (Keurig) on campus.
- build throughout the semester 

Impact of Scientific Method (GE Area E – Lifelong Learning & Self Development)

Students practice the evaluation and use of quantitative evidence in reasoned decision making. Topics include uncertainty, significance, trends, experimental design, and causality.

Learning Outcomes

- Locate sources of quantitative experimental data related to a question or topic.
- Evaluate the reliability of the information source along with determining if the context and origin of the quantitative data to determine it can be used for various applications.
- Assess the relevance and significance of common forms of quantitative data in supporting or refuting claims and assertions appearing in the literature and media regarding current societal issues.
- Demonstrate proficiency in using quantitative data and evidence in a reasoned manner to inform decision making on life issues related to how environment and society can affect our personal lives.

Cultural Competence

- Explore careers and organizations involved in generating or using reliable quantitative data on a wide range of topics.

CSU STEM Collaboratives Program

- Direct support for FYE, liaison for all CSM incoming freshmen.
- Significant gaps in persistence, graduation rates, and first-year retention rates between URM students and their white peers.