

Education Innovation and Research Program (EIR) Project Abstract

Applicant Name: San Jose State University Research Foundation

Project Title: Science Roots: Growing Student Futures through GenAI Enhanced Project-Based Learning using Green Ninja

Type of Grant Requested: (select one) Early-Phase Mid-Phase Expansion

Absolute Priorities the Project Addresses: (select all that apply)

- Absolute Priority 1-- Demonstrate a Rationale (Early), Moderate (Mid), Strong (Expansion)
- Absolute Priority 2-- Field-Initiated Innovations—General
- Absolute Priority 3-- Promoting STEM Education
- Absolute Priority 4-- Meeting Student Social, Emotional, and Academic Needs
- Absolute Priority 5-- Educator Recruitment and Retention

Competitive Preference Priorities the Project Addresses: (select all that apply)

- Competitive Preference Priority 1— Promoting Equity in Student Access to Educational Resources and Opportunities: Implementers and Partners
- Competitive Preference Priority 2— Addressing the Impact of COVID–19 on Students, Educators, and Faculty

Total number of students to be served by the project: 8000

Grade level(s) to be served by the project: 8

Definition of high-need students: Low-income diverse learners who are scoring below proficient on the state science test.

Brief description of project activities: The project aims to enhance academic outcomes for 8,000 high-need middle school students in California by: 1) developing and integrating generative AI tools into the Green Ninja curriculum to support project-based learning (PBL), 2) testing the enhanced program with updated teacher training and support while evaluating student outcomes, and 3) creating and testing strategies to scale the program for long-term success and widespread adoption.

Summary of project objectives and expected outcomes: Teachers and students will engage with the enhanced Green Ninja curriculum supported by generative AI tools. Students will participate in project-based learning activities, collaborate on science projects, and receive real-time feedback and support, leading to improved science achievement and engagement as measured by standardized test scores, project assessments, and student surveys. The project will involve 80 middle school teachers from 80 schools, focusing on low-income, diverse learners who are performing below proficient on the state science test.

Summary of how the project is innovative: This proposal leverages evidence-based PBL methods through the Green Ninja curriculum and integrates cutting-edge GenAI tools to make teaching PBL easier for teachers and more engaging, effective, and equitable for underserved middle school students.

Other studies related to the proposed project: Improving science achievement - Is it possible? Evaluating the efficacy of a high school chemistry and physics project-based learning intervention (██████████).

Proposed implementation sites: This project will serve 80 schools in California. We have secured regional-level, and district-level letters of support that represent over 300,000 middle school students.

Organizations partnering with this project: WestEd is the independent evaluator and will conduct a randomized control trial of the main innovation. Green Ninja will lead the development of the GenAI tools and updates to the curriculum.