

ABSTRACT

Learning by Making: STEM Success for Mendocino County

Sonoma State University (SSU), in partnership with the Mendocino County Office of Education (MCOE), requests funding for an i3 Development award: *Learning by Making*. This proposal is responsive to Absolute Priority 8: Serving Rural Communities, and addresses the additional Absolute Priority 3: Improving Science, Technology, Engineering, and Mathematics (STEM) Education, subpart a) Redesigning STEM course content and instructional practices to engage students and increase student achievement. Through *Learning by Making* we will develop a two-year science-driven computational-thinking integrated based STEM curriculum that improves mathematical and science proficiency for 485 high-needs rural students in six Mendocino County, California high schools. *Learning by Making* applies constructionist learning philosophy to go beyond traditional project-based learning curricula through a fusion of mathematical skill building and Logo-based computational thinking applied to real-world scientific problems. Project goals for *Learning by Making* include: (a) develop two year-long integrated high school STEM courses that will be accepted as elective credit for university eligibility in California, (b) train at least half of the science and mathematics teachers in our partner schools to successfully deliver the curriculum, and (c) improve math and science proficiency by 15% for students enrolled in the new courses at each school. Comprehensive evaluation of our work by STEM experts at WestEd will add to the growing knowledge bases defining the effectiveness of computational thinking within STEM courses and of the integration of new science and mathematics practice standards. The partners for *Learning by Making* include SSU, a non-profit institution of higher education, six rural high schools, the Mendocino County Office of Education, a rural LEA, and Logo curriculum specialists in the private sector.