Disciplinary Focus

Lewis-Clark State College (LCSC) seeks $200,000 through the National Science Foundation’s Advanced Technological Education Program to support an interdisciplinary education initiative that develops and tests a model for rural, regional workforce development that supports small rural manufacturing and their ability to be innovative and agile in the global economy. With renewed emphasis on high tech regional economic development planning and implementation as the road to economic diversity and regional prosperity, the project seeks to address the struggle for rural schools to address the technical needs of the emerging workforce and the challenges for rural areas to retool themselves for the global economy in manufacturing. It recognizes that rural areas do not have the financial and human capital resources to mimic the manufacturing workforce partnerships in urban areas.

Activities

Over a 36-month period, this project shall create and document a process for establishing and maintaining a rural, regional workforce consortium to support technical education and local manufacturers; pilot integration of a common manufacturing solid modeling computer-aided-design tool into high schools which encourages innovation and problem solving across STEM curriculum; develop and test an active mentoring program that provides practical technical skill development in a contextual manner that can be transferred from school to the

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world of work; and begin building career pathways related to STEM-rich technical fields. Throughout the project, the model and all its elements will be evaluated by analyzing learning effectiveness through three test systems; considering student team work and problem solving through project outcomes and student evaluations; and looking at educator teams through teacher self-evaluations and by tracking hours of activity. Deliverables shall include documentation of the established consortium (by-laws, memorandum of agreement, and meeting notes); completion of a 4-day solid modeling professional development workshop and two, 2-day curriculum professional development workshops focused on using solid modeling in STEM curriculum; developed accredited course/s for secondary educators using STEM student team activities for course projects; student independent electronic learning modules from manufacturer project ideas; a mentoring program guide and project activities; articulation agreements for career ladders; and dissemination materials.

**Primary Audience**

The primary audience to be affected is secondary school students and secondary school teachers in six, local school districts. They will be supported by a carefully crafted team of education and economic development professionals to include Lewis-Clark State College, the University of Idaho, Clearwater Economic Development Association, Northwest Intermountain Manufacturers Association, Kamiah High School, and Valley Vision.

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DUE-1104078

Abstract

**Intellectual Merit**

This project meets the challenge of what has been identified as a crisis of U.S. student disengagement from STEM. It presents a model that involves students in *real learning through real work*. Student work in this instance is project-based and situated in the students’ respective local community. It inherently reflects real learning because it is based on a real-world need or problem identified by a local manufacturer. The project-based/problem-based student experiences will also be learner-centered in that they will employ engineering design principles in which students will Design, Build, Analyze, and Produce. The effort is “vocational” in that it is delivered through secondary CTE programs and affiliated with post-secondary CTE programs, but it also applies a vocational pedagogy through an experiential, real work application approach to teaching/learning.

**Broader Impacts**

While models have emerged to prepare CTE teachers to teach STEM in urban areas that have adequate resources, a viable model has not emerged that prepares CTE professionals to teach STEM in rural regions where resources are scarce and population density is lacking. This project meets the Advanced Technological Education Program’s central goal of “producing more qualified science and engineering technicians to meet workforce demands, and improving the technical skills and the general science, technology, engineering, and mathematics (STEM) preparation of these technicians and the educators who

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prepare them.” It addresses ATE’s particular interest in rural technician education.