

***Intellectual Merit.*** The proposed project, Science and Engineering in the Lives of Students (SELS), will use video case studies highlighting the role of science in construction problems as the core of a professional development program with video, print, and web components. The program will utilize an adaptation of a research-based instructional model and problems familiar to the construction industry generated in previous ATE/NSF and Department of Education projects showing how to use construction problems for teaching science. The materials will be organized into a complete professional development program and piloted with middle and high school science teachers and community college science and technology faculty. A regional panel of expert community college faculty and high school teachers will serve as paid consultants to serve as a Content Review Panel in the development and testing of these materials.

The proposed project will create a professional development course in DVD format with video, print, and web components that (a) demonstrate teaching standards-based science through construction problems, (b) demonstrate ways to highlight how high school science is valuable for a wide range of technical professions specifically in construction fields, and (c) presents tools and information for helping students, particularly women and minorities, understand the relationship between content knowledge and career pathways ranging from the apprentice trades to professional engineer. The design capitalizes on a personal connection between people and their built environments through a focus on construction concepts that link science to people and their communities.

Video components supported by web and print material utilize a research-based form of professional development that links cases in professional construction environments with model classroom teaching. This approach introduces and strengthens teaching strategies for building student understanding of science in meaningful contexts. University and community college faculties will combine their expertise from work on curriculum and instruction for teaching science through construction problems. Media production will be handled by the internationally recognized work of the Smithsonian Astrophysical Observatory through its Science Media Group, producers of *A Private Universe*.

***Broader Impacts.*** This project will provide the field of STEM education with a tool for use in a variety of professional development settings. The product will be a model format for scalability and transportability. The view of teaching science in this program will have appeal in large urban centers as well as remote rural areas served by educational service district personnel. Construction is a ubiquitous activity associated with high public interest both in terms community controversy and community needs. The DVD case-based format and professional development design with online resources will foster linkages among teachers, local construction professionals, community colleges, and schools of engineering. The materials will be available for free download through servers at OSU and catalogued in NSF National Science Digital Library. The associated web site will provide a resource for teaching ideas and links to

other related resources. The materials developed by this project will be listed in *Vernier Software and Technology* catalogue and listed in materials distributed by American Association of Community Colleges where the DVD will be sold at cost and will be packaged with relevant probe ware technology and print materials for teachers who prefer not to download the free electronic version.