

PARTNERSHIP FOR ENVIRONMENTAL TECHNOLOGY EDUCATION

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ABSTRACT

The need for broad cooperative effort directed toward the enhancement of science and mathematics education, including environmental science and technology has been recognized as a national priority by government, industry, and the academic community alike. In an effort to address this need, the Partnership for Environmental Technology Education (PETE) has been established in the five western states of Arizona, California, Hawaii, Nevada and Utah. PETE's overall objectives are to link the technical resources of the DOE, EPA, and NASA Laboratories and private industry with participating community colleges to assist in the development and presentation of curricula for training environmental-Hazardous Materials Technicians and to encourage more transfer students to pursue studies in environmental science at four-year institutions. The program is co-sponsored by DOE and EPA. DoD participation is proposed. PETE is being evaluated by its sponsors as a regional pilot with potential for extension nationally.

INTRODUCTION

The need for broad cooperative effort directed toward the enhancement of science and mathematics education in the United States has been recognized as a national priority by government, industry and the academic community alike. Within the context of this broad need, the U. S. Department of Energy and the U. S. Environmental Protection Agency have defined "needs driven" or specific interests which require increasing the numbers of qualified graduates in areas of environmental science and engineering, including technicians, and fostering improved public literacy in environmental science and waste management. Carefully targeted education intervention programs are required if these important goals are to be realized.

There are approximately 1200 community, technical and junior colleges in the U. S. with a 1989 student population of 5.7M. This does not include another 5.0M non-credit enrolled students attending these two-year institutions. On the basis of sheer numbers alone, these institutions represent a significant, nationwide resource that should play a key role in the conduct of a successful Environmental Protection/Restoration and Waste Management education program.

Community colleges have been in the process of a major transition during the 1980s. They have moved toward a much stronger role in vocational education and in supporting U. S. industry. Despite this major shift toward vocational education, however, the nation's community colleges still represent a key transition point for millions of students (particularly minority students) between high school and the four-year institutions. Operating on a philosophy of higher education opportunity for all, with minimal entrance requirements and low cost, the community colleges afford the average high school student the opportunity to start college when they may not have qualified to enter a four-year institution, or may still be trying to decide the appropriate direction of their college careers. The community colleges also increasingly represent the easy access, low cost alternative for people already in the work force to return for continuing vocational training or retraining for new career directions.

For these reasons, most the minority or other disadvantaged students presently pursuing post-secondary education in the U. S. today are attending a community college. An

environmental education intervention program which recognizes current problems in the nation's education system and is geared to the realities of changing demographics must focus adequate programmatic attention on this pivotal segment of the education pipeline.

APPROACH

The Partnership for Environmental Technology Education (PETE), a regional program which could be extended nationally, has been developed and implemented to link the technical resources of federal laboratories and the private sector with regional community colleges to provide direct technical assistance for:

- development and presentation of Environmental-Hazardous Materials Technician curricula at the two-year degree/certificate level;
- development/enhancement of environmental science and pre-engineering curriculum targeting the attraction and preparation of transfer students to four-year institutions.

This is a five-year program which will evolve through a partnership of government, industry and academic, and include the participation of the DOE National Laboratories, the Nevada Test Site and regional EPA, and NASA Laboratories. PETE is being supported by its sponsors during the first eighteen months on a pilot basis in five western states.

GOALS

1. Provide a mechanism for bringing the technical expertise of the DOE, EPA, and NASA Laboratories into direct and continuing support of the community colleges.
2. Accelerate the development and implementation, and enhance the technical foundation of Environmental-Hazardous Materials Technician curricula to meet the near-term and long-term human resource needs of both government and industry.
3. Provide a mechanism for coordinating greater private industry, government, academic, professional society and Laboratory collaboration at the community college level.

4. provide a mechanism for assisting with outreach initiatives to feeder high schools and articulation to four-year curricula in environmental science and engineering.
5. Develop a continuing collaborative and mutually supportive relationship between DOE, EPA, and NASA Laboratories in support of national education objectives.

PILOT PROGRAM

The first year effort will be devoted to developing and implementing the program on a pilot basis in the states of Arizona, California, Hawaii, Nevada, Utah. (See Fig. 1) This will include two primary initiatives:

- Environmental-Hazardous Materials Technician curriculum development and implementation: A program is in place to assist community colleges in implementing this curriculum in the five-state region, including accelerated instructor training and creative approaches to assuring the availability of state-of-the-art equipment and teaching aids.
- Resource Instructor Institute in the Environmental Sciences: Each community college within the five-state region will be invited to nominate a science, math or hazardous materials technician instructor to participate in a "regional instructor network." The Institute will serve as a formal mechanism for the community colleges, DOE, EPA, and NASA Laboratories, the private sector and professional societies to coordinate on:
 - regular information exchange (semi-annual, 2-day conferences),
 - direct Laboratory and industry support to curriculum presentation,
 - curriculum articulation with four-year institutions,
 - development and implementation of high school or community outreach programs (e.g. 2+2+2),
 - laboratory and industry summer work/research, and continuing education opportunities for instructors and students,
 - DOE/EPA/NASA technology transfer,
 - recruiting opportunities for DOE, EPA, NASA, their contractors, and private industry.

This pilot program has been developed and implementation begun through the collaboration of several key regional players:

- Arizona, California, Hawaii, Nevada, Utah Community Colleges
- Environmental Monitoring Systems Laboratory (EPA)
- Industry Education Council of California
- Jet Propulsion Laboratory (NASA)
- Lawrence Berkeley Laboratory (DOE)
- Lawrence Livermore National Laboratory (DOE)
- National Center for Research in Vocational Education
- National Environmental Training Association
- Navajo Community College

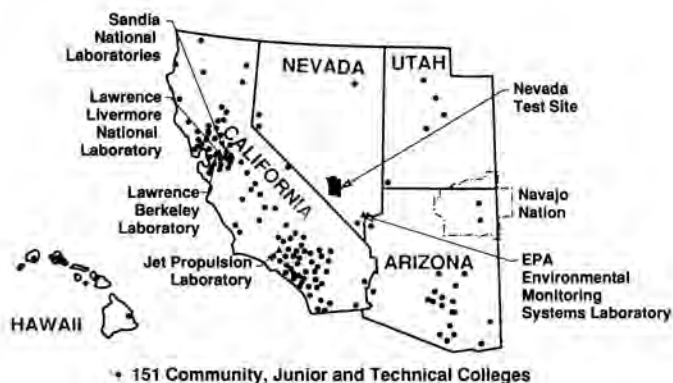


Fig. 1. PETE Region.

- Nevada Test Site (DOE)
- Sandia National Laboratories, Livermore (DOE)

Also participating in the program is the American Association of Community and Junior Colleges, the Department of Energy San Francisco and Nevada Field Offices, and the EPA Region IX Office. Representatives of the Environmental Protection Office in each of the five states will also be invited to advise the program on a regular basis.

ROLE OF PRIVATE INDUSTRY AND PROFESSIONAL SOCIETIES

Private industry and professional societies will play a vital role in the development and conduct of the program. This will include participation in the Resource Instructor Institute and advising on curriculum development and presentation. Along with government, private industry will be a primary beneficiary of the significantly increased number of technician graduates which will result from this initiative. We will seek substantial private sector funding and/or in-kind support for our regional pilot program. This will primarily involve assistance with equipment needs, cosponsorship of semi-annual Resource Instructor Conferences, and summer internship opportunities for instructors and students. The Industry Education Council of California, a statewide consortium of government, industry and academia, is a full partner in PETE, bringing direct access to many of the State's major corporations. Similar organizations will be sought in Arizona, Hawaii, Nevada and Utah to coordinate private sector participation in the program.

STRATEGY FOR A NATIONAL PROGRAM

The overall goal of this program is to significantly enhance the number of graduates emerging from the education pipeline in disciplines related to environmental science and engineering, with an emphasis on technicians. The PETE methodology, as demonstrated through this regional pilot program could be extended nationally in order to assure maximum beneficial impact. During the second year of the program, we plan to develop and host a series of workshops for other DOE, EPA, and NASA Laboratories and community colleges to assist them in planning a similar program in their respective regions if supported by our DOE/EPA sponsors. The pilot Laboratories, Community College representatives, and other partners will be available during years 3-5 to

directly assist other regions in starting up their programs, while recognizing the unique needs and resources of each region.

NCRVE NATIONAL LABOR MARKET STUDY

The National Center for Research in Vocational Education, a part of the U. C. Berkeley Graduate School of Education, is a study center funded by the U. S. Department of Education. The Center is conducting a two-year assessment of the projected national labor market demand and skills requirements for Environmental-Hazardous Materials Technicians on a matching funds basis as a part of its Department of Education-supported program. The results of this study will serve as a vital indicator of just how extensively the PETE methodology should be replicated nationally.

ORGANIZATION AND MANAGEMENT

The Partnership is directed by a Steering Committee representing the Community College systems in the five pilot region states, the Laboratories and NTS, private industry, and other participating organizations. The Committee is chaired by an elected community college representative. The National Environmental Training Association is presently serving as Fiscal Agent.

BUDGET

This five-year program is being cosponsored by DOE and EPA as a collaborative national initiative. Total funding for the Western pilot region was \$250K in FY91. A budget of \$950K is proposed for FY92 and we are now proposing that the Department of Defense join the Department of Energy and EPA in cosponsorship of PETE. Additional funding support will be required for implementation in other regions. Significant support will also be sought from local industry in the five states. The State of California continues to commit limited funding for the development and implementation of the Environmental-Hazardous Materials Technician curriculum at additional colleges, and the NCRVE has committed a total of \$100K to the national labor demand study.

Funding to initiate this program in the five-state region in FY91 was provided by the DOE Offices of Environmental Restoration and Waste Management and Contractor Human Resource Management.

ACCOMPLISHMENTS TO DATE

Some specific accomplishments can be cited since PETE was initially funded by DOE in April 1991:

- The formation of PETE has created a regional infrastructure within which the academic community, industry, federal agencies, the states and professional societies can work together toward common goals in environmental protection, restoration and wage management education and training. The program provides a mechanism for focused action, leveraging of resources and information sharing which is already benefiting the five participating states.
- The semi-annual Resource Instructor Conferences provide a regular forum for information exchange and mutual support among participating community colleges and the other regional partners. Two conferences have been conducted to date. The first, in

San Francisco in August 1991, included representatives from sixty regional colleges and provided the Steering Committee with important input on problems and recommended priorities for PETE. The second conference was held in Las Vegas, Nevada, in February 1992. This even focused on the issue of private sector demand for Environmental-Hazardous Materials Technicians and the pros and cons of developing national certification standards.

- During the summer of 1991, PETE assisted in the initiation of Environmental-Hazardous Materials Programs in the State of Nevada at the Community College of Southern Nevada in Las Vegas and Truckee Meadows Community College in Reno. PETE sponsored the training of the two selected instructors at the UC Davis-Extension six-week intensive program. Ten instructor training or new program start-up grants will be offered by PETE for the summer of 1992.
- The national study of demand and skills requirements for Environmental-Hazardous Materials Technicians was initiated by The National Center for Research in Vocational Education. The final report is due December 31, 1992.
- The Industry Education Council of California is establishing a statewide committee to implement industry participation in PETE in California. This committee will include representatives from several major corporations in the state.
- LLNL and Los Positas College are developing plans for establishing a Center for Environmental Training/Management on the Los Positas campus to serve eastern Alameda County. The College will compete to establish the Environmental-Hazardous Materials curriculum under PETE sponsorship in 1992.
- PETE has drawn increased national attention to the potentially pivotal role of community colleges in producing qualified Environmental Hazardous Materials Technicians to meet the needs of both government and industry. Our efforts have also led other regions to begin to form similar partnerships, most notably in the southeastern states.

For more information about PETE, contact the 1991-92 Steering Committee Officers:

Chairperson:	Mr. Richard Fosse Fresno City College (209) 442-8289
Vice-Chairperson:	Mr. David Hoggard Community College of Southern Nevada (702) 643-6060 (Ext. 205)
Secretary:	Mr. Paul R. Dickinson Lawrence Livermore National Laboratory (510) 422-6525
Fiscal Agent:	Mr. Rick Richardson National Environmental Training Association (602) 956-6099