Chapter 4

LEADERSHIP ACTIVITIES

Introduction

The Directorate for Education and Human Resources (EHR) has undertaken numerous leadership activities involving two-year colleges. Many of these activities are centered in the Division of Undergraduate Education (DUE).

Outreach Workshops

In FY1997–FY1999, regional workshops targeted administrators and faculty members from two-year colleges. The goals of the workshops were (1) to discuss funding opportunities with the two-year college community and their academic and industrial partners, (2) to encourage quality proposals from two-year colleges to more NSF programs, and (3) to give the two-year college community an opportunity to interact with NSF program officers.

DUE program officers participated in a series of multi-agency funding workshops organized by the U.S. Department of Education. From 1997 to 1999, six of these workshops were held at rural colleges in North Carolina, Virginia, Hawaii, Iowa, Arkansas, and Texas. This initiative was designed to familiarize colleges that do not normally have access to information about federal programs and to give two-year college participants an opportunity to hear about programs and discuss their ideas with program officers. At the workshops, government representatives discussed funding opportunities and leadership activities involving two-year colleges. The agencies included NSF, the Department of Education (e.g., FIPSE, Community Learning Centers program, School-to-Work, Title III, International Education Programs, Trio, Gear-Up), NASA, the U.S. Department of Agriculture, the U.S. Information Agency (Fulbright program), the National Endowment for the Humanities, and the U.S. Department of Defense. Approximately 1,000 people from rural colleges have been served by these workshops.

In conjunction with professional meetings, program directors have organized symposia that focused on innovations that have taken place specifically at community colleges as a result of funding from NSF programs. These symposia gave community college faculty the opportunity to discuss and disseminate innovative materials that they developed and novel approaches that they used in their NSF-funded projects. Community college faculty were also featured, along with faculty from other types of institutions, in symposia that showcased results from funded projects originating from all types of institutions, from two-year colleges to research universities. Proposal-writing workshops have been presented for faculty in state community college systems and for members of the Council for Resource Development (CRD), an organization that has responsibility for grants acquisition at many community colleges. CRD arranged for groups of community college grant writers and faculty to attend such a workshop each year. In addition, presentations were made at CRD regional meetings. A special panel on the ATE program, which included biologists and engineers as well as mathematicians, was held at the annual conference of the American Mathematical Association of Two-Year Colleges (AMATYC). AMATYC has held special panels and initiatives highlighting the report *Investing in Tomorrow's Teachers* (NSF 99-49) on teacher preparation in community colleges. The American Society for Engineering Education's Two-Year College Division sponsored special sessions on NSF funding opportunities at its national conference.

In 1999, a special symposium on "NSF-Catalyzed Innovations in the Undergraduate Laboratory" was held in conjunction with the 218th American Chemical Society National Meeting in New Orleans, Louisiana. This particular symposium highlighted 16 NSF-funded laboratory curriculum innovations, including one from a community college on "Technology as a Discovery-Based Learning Tool in the Chemistry Curriculum."

"Shaping the Future" Workshops

An ambitious yearlong study that provides a detailed look at the state of undergraduate education in science, mathematics, engineering, and technology (SMET) in U.S. colleges and universities was completed in 1996. A subcommittee of the EHR Advisory Committee conducted the study, the first of its kind in a decade. The report from the study, *Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering, and Technology* (NSF 96-139), provides action-oriented recommendations for improving the quality of undergraduate education in SMET. It is broad in scope, reflecting the advice and contributions of hundreds of individuals representing the public and private sectors, professional societies, and diverse academic groups.

Within the context of a broader study of the centrality and importance to society of an undergraduate education, the report urges attention to the needs of all undergraduate students in all types of educational institutions, recognizes the importance of two-year colleges as the starting point (and often re-starting point) in higher education for increasing numbers of students, and suggests increased attention to the potential role of two-year institutions in addressing the nation's need for well-trained K-12 teachers.

The report provides a rich set of recommendations that, when taken together, constitute a coherent, broad-reaching call to action to improve SMET education for *all* undergraduate students. Four ideas constitute a firm foundation for this plan:

- Every undergraduate should have access to an excellent education in SMET and be encouraged to study and learn these subjects.
- A flexible SMET curriculum should provide students with greater awareness of, and preparation for, career opportunities.
- The educational environment should be supportive of students, promote active learning, encourage collaboration, and emphasize inquiry more than rote acquisition of facts.
- All links in the education chain, including K-12, undergraduate, graduate, and professional schools, must work together to provide, assure, and reward sound learning.

From 1997 to 1999, DUE sponsored 24 regional "Shaping the Future" workshops. Three of these were organized by community colleges: the workshops in South Carolina (Trident Technical College), New York (Borough of Manhattan Community College), and North Carolina (the North Carolina Community College System). Other community colleges served as co-organizers with four-year institutions. For example, the Maricopa Community College District was one of the co-organizers with Arizona State University for the workshop held in Arizona, and St. Louis Community College co-organized the Missouri workshop with the University of Missouri. Of the over 4,300 participants in the workshops, it is estimated that approximately 17% were from two-year institutions.

Advanced Technological Education: Publications

For each fiscal year, the ATE program has published an *Awards and Activities* book. For FY1997, FY1998, and FY1999, these publications are NSF 98-110, NSF 99-113, and NSF 00-112, respectively. In addition to award abstracts, the books include an overview of the ATE program, a summary of the program's activities during the fiscal year, and indexes of active ATE awards by area of technology, state, and PI.

The May 1999 issue of *Synergy*, EHR's newsletter, highlighted the ATE program and a number of projects that the program has funded. This publication, NSF 99-71, was mailed to over 19,000 educators, industry representatives, and professional societies and was also distributed at conferences.

The publications mentioned above (as well as other NSF publications) are available in electronic formats through NSF's Online Document System at <http://www.nsf.gov/cgi-bin/pubsys/browser/odbrowse.pl>.

Phi Theta Kappa Summer Internship Program

During the summers of 1997, 1998, and 1999, NSF cooperated with Phi Theta Kappa, the international honor society for two-year colleges, to offer a summer internship program at NSF for two-year college honor students. Two interns worked each summer on the ATE program and other two-year college activities. The internship program was designed (1) to allow students to work with senior agency staff on special projects, (2) to give them exposure to SMET education programs, (3) to let them interact with policymakers, and (4) to give them experience working in an office.

Projects assigned to the interns capitalized on their creative skills and strengths. During the summer of 1997, interns Sarah Asbury Miller, from Stark Technical College in Alabama, and Allan Tagayuna, from Leeward Community College in Hawaii, worked on a Web site for the ATE program and helped to organize Community College Day at NSF (see the description of this event below). In 1998, Jason Edington, from Saddleback College in California, and Andria Mallernee, from Kellogg Community College in Michigan, investigated teacher preparation activities in NSF-funded projects at community colleges. An article entitled "Community Colleges Can Help Prepare Future Teachers," published in the *Community College Times*, highlighted this activity. In 1999, Augustine Adda, from the County College of Morris in New Jersey, and Heath Strong, from Broome Community College in New York, developed a collection of one-page profiles of 21 exemplary ATE projects across a variety of science and technology fields. These profiles were published by the Maricopa Advanced Technology Education Center as a booklet entitled *Broadening the Impact: Resources for Advanced Technological Education*. Five thousand copies of this booklet were distributed by mail and at the annual convention of the American Association of Community Colleges.

Information on the internship program can be obtained from Phi Theta Kappa International Honor Society, Mississippi Education and Research Center, 1625 Eastover drive, Jackson, MS 39211.

Community College Day at NSF

In 1997 and 1999, NSF recognized Community College Month by hosting Community College Day. (In 1998, a special workshop, "Investing in Tomorrow's Teachers" [see the description later in this chapter], was held to examine the role that community colleges and their students play in the preparation of future teachers.) NSF staff, representatives from the American Association of Community Colleges (AACC),

numerous community college faculty and administrators, and professional society representatives attended these events.

Community College Day highlights scientists and engineers who have begun their education in two-year colleges and have gone on to make significant contributions to society in SMET fields. In 1997, the featured speakers were Andrea White, an engineer who supervised the construction of the Redskins Stadium and attended Montgomery College in Maryland, and William Hanley, president of Galileo Corporation and a graduate of Corning Community College in New York. Both speakers talked about the importance of their two-year college experience in shaping their careers. In 1999, Walter Smith, a research geophysicist at the National Oceanic and Atmospheric Administration and a graduate of Cuesta College in California, spoke on "Mapping the Ocean Floor from Space."

Cooperative Efforts with the American Association of Community Colleges (AACC)

AACC Board Activities

NSF's Official Liaison to Community Colleges regularly provides updates on NSF programs and activities to the AACC board as well as the board of the Council for Resource Development, an AACC affiliate. These sessions also provide an excellent opportunity for community college leaders drawn from across the nation to provide feedback and input to NSF.

NSF staff annually host a session for a group of approximately 20 community college presidents participating in AACC's "DC Experience," which provides an opportunity for the presidents to learn about public policy.

AACC National Convention

NSF has sponsored special activities each year at the AACC convention. In 1997, NSF organized a special "Shaping the Future" session that focused on the role that two-year colleges play in SMET activities. Other presentations highlighted the joint NSF–Phi Theta Kappa Mentors programs. In 1998, the vice president for student development of the Maricopa Community College District in Arizona organized a special session highlighting NSF's support of community colleges through the Maricopa Advanced Technology Education Center (MATEC), an ATE Center of Excellence for semiconductor manufacturing education. In 1999, seven of the ATE centers showcased their activities as a group in the AACC exhibit hall. For this meeting, MATEC produced and distributed a booklet entitled *An Overview and Profile of 11 National Centers*; and AACC mailed additional copies to other institutions after the meeting. NSF had a booth near the centers' exhibit area, which allowed interactions with people who wanted to see what NSF had supported as well as to discuss opportunities for their institutions. A special discussion session involving presidents and other administrators from two-year colleges having ATE centers and projects was organized by the Maricopa Community College District. Items discussed included securing industry support, leveraging resource (both financial and intellectual), working with the community, sustainability, accountability, and FastLane (NSF's Web-based system for conducting business electronically). NSF also led sessions on teacher preparation in two-year colleges and NSF initiatives for community colleges.

Advanced Technological Education Principal Investigators Conferences

The ATE program has supported outreach activities of AACC and has used annual meetings by this group as a convenient venue for meeting with ATE PIs. AACC has also organized, in cooperation with NSF, an annual conference, held in the DC area, for ATE PIs. These conferences feature keynote speakers, panel discussions on topics relevant to technological education, contributed-paper sessions, showcase and

poster sessions for ATE centers and projects, and special pre-conference workshops focusing on grant administration, project management, project evaluation, and other topics of interest to grantees. Attendees include members of ATE project teams, as well as business and industry partners, other leaders from community colleges and K-12 education, and representatives from professional societies and government agencies.

The fourth annual ATE PI conference was held in November 1997 and had nearly 300 participants. The theme, "Two-Year College and Secondary School Partnerships," stressed the importance of collaboration between community colleges and K-12 school systems for effective SMET education programs. Rep. David Price, who originated the legislation that led to the ATE program, and Vickie Schray, of the National School-to-Work Office, gave keynote addresses. Plenary sessions focused on programs at ATE centers, teacher enhancement activities at ATE centers, and ways to market technician education.

The fifth annual conference, "ATE at Five," was held in November 1998 and had 325 attendees. The keynote speakers were Mark Harkins, senior legislative aide to Rep. David Price, and Richard Judy, senior fellow at the Hudson Institute. Mr. Harkins spoke about the background and national view of ATE programs, and Dr. Judy presented a demographic analysis of "Employment Perspectives in Advanced Technologies." Centered around the theme "Partnerships, Students, and Accountability," six panel discussions focused on student development, faculty development, materials and product development, standards development and use, institutionalization and institutional support of ATE programs, and pedagogy.

The sixth annual conference was held in October 1999. Approximately 400 people attended. Following the theme "Broadening the Impact," conference activities examined ways of effectively disseminating exemplary educational materials and practices developed by ATE projects. The meeting included presentations and participation by publishers and representatives of news media. The keynote speakers were Linda Chaput, president and founder of Cogito Learning Media, Inc.; Curt Suplee, science reporter for the *Washington Post*; and Mary Beth Susman, CEO of the Kentucky Commonwealth Virtual University. Panel sessions examined effective industry–education partnerships, technology education for future teachers, the use of mentoring in disseminating best practices and materials, evaluating ATE projects, broadening the impact of the program to the K-12 community and to four-year colleges and universities, dissemination through publication and online courses, institutionalizing reforms in technological education, and working with the press.

Teacher Preparation in Two-Year Colleges

In the spring of 1998, a workshop was held to develop recommendations for two-year colleges to help meet the critical need for teachers well-prepared in SMET. The conference focused on strategies to increase the awareness of two- and four-year college mathematics and science faculty and administrators, national leaders in education, and funding agencies of the key role that community colleges play in the science and mathematics preparation of teachers. Eleven exemplary two-year college programs in teacher preparation were chosen in a national competition to be highlighted at the conference. Participants developed recommendations on the recruitment of prospective teachers, strengthening SMET core courses, preteaching experiences, in-service activities, and liaisons of two-year colleges with other two-year colleges, four-year colleges and universities, business and industry, and professional societies. The report from the conference, *Investing in Tomorrow's Teachers: The Integral Role of Two-Year Colleges in the Science and Mathematics Preparation of Future Teachers* (NSF 99-49), has been used extensively by institutions and professional societies to highlight the role that two-year colleges play in the pre-service education of teachers and to develop new initiatives.

Articles

NSF's activities in support of two-year colleges are increasingly highlighted in national publications. The AACC's *Community College Times* has regularly carried articles on activities at NSF. Articles have covered, for example, the annual ATE PI conferences, Community College Days at NSF, and the ATE program. Feature articles on NSF-supported projects have also been published, including cover stories on MATEC, BioLink (the ATE center for biotechnology education based at the City College of San Francisco), and the ATE Mentoring Program managed by AACC.

The American Society for Engineering Education's award-winning magazine, *PRISM*, featured community colleges in a 1997 issue and highlighted the Maricopa Community College District's efforts at engineering education reform through its partnership with the NSF Engineering Foundation Coalition.

"WANTED! Proposals from Two-Year College Chemistry Faculty!" by DUE program director Vicki Bragin, was published in *Chemistry Outlook*, a publication of 2YC3 (Two-Year College Chemistry Consortium).

"What's New at DUE?" is a column that appears three times a year in the *CHED Newsletter*, a publication of the American Chemical Society's Division of Chemical Education. Articles are written by chemistry program directors in DUE and always include funding opportunities for all undergraduate faculty, including two-year college faculty.