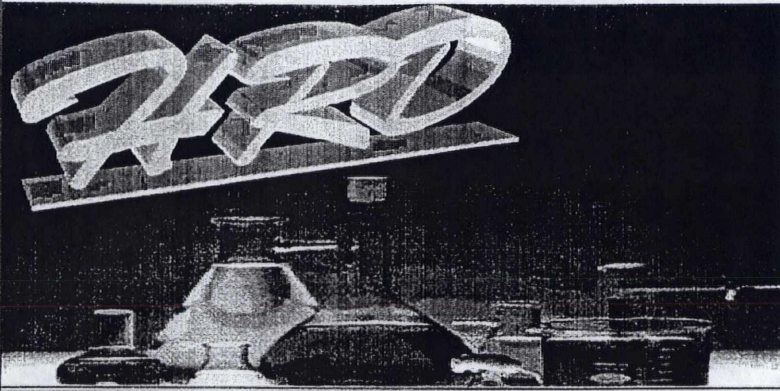
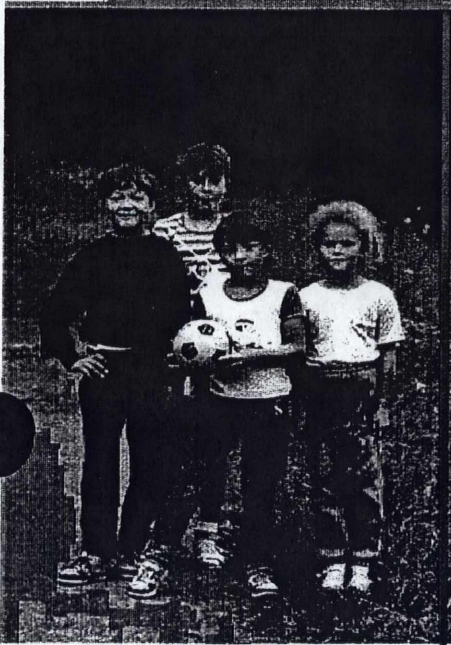




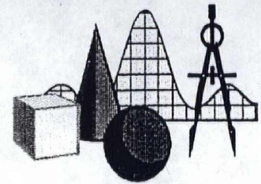
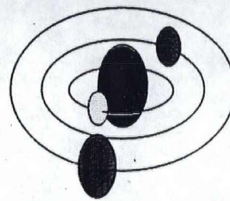
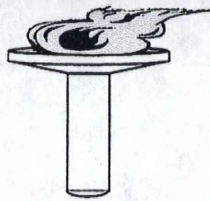
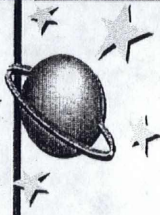
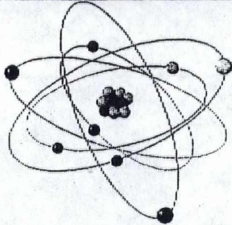
NSF



Human Resource Development



Annual Report 1998



A STRATEGY FOR

Diversity and Excellence

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Division Of Human Resource Development (HRD)

EXECUTIVE SUMMARY

Overview

The Division of Human Resource Development (HRD) has primary responsibility within the Directorate for Education and Human Resources (EHR) for ensuring diversity and excellence for all students who participate in science, mathematics, engineering, and technology (SMET) activities. Coupled with this responsibility is increasing the opportunities for individuals from underrepresented groups to participate and succeed in the science and engineering enterprise. The division is also held accountable for providing resources to upgrade the research and education capability of institutions that enroll significant numbers of underrepresented minorities including Black Colleges and Universities (HBCUs), Tribal Colleges, and Hispanic Serving Institutions (HIS). The programs in HRD reflect the National Science Foundation's continuing commitment to increase the literacy of all citizens in science and engineering. HRD program activities have a strong focus on partnerships and collaborations in order to maximize the preparation of a well-trained science and technological workforce for the 21st century.

NSF Performance Goals

The Division is continuing its first priority on reaching the following GPRA outcome goals: 1) the preparation of a diverse globally oriented workforce of scientists and engineers; and 2) improving achievement in mathematics and science skills needed by all Americans. To accomplish this, the use of program databases to monitor and evaluate project effectiveness is being institutionalized. The AMP Monitoring and Reporting System (MARS), the CPMSA Tabulated Indicators for Systemic Changes (TISC), and the CREST Center Activity Indicators and Monitoring System (CAIMS) are databases that mirror the significant impact of the program's resources on minority student enrollment nationally and the output resulting from NSF support. Databases are being planned for the Program for Women and Girls and the Program for Persons with Disabilities. Information from these databases will be used as part of the annual Government Performance and Results Act (GPRA) response.

The National Science Foundation's (NSF) response to the GPRA lists the following outcome goals:

- Goal #1.** Discoveries at and across the frontier of science and engineering
- Goal #2.** Connections between discoveries and their use in service to society
- Goal #3.** A diverse, globally-oriented workforce of scientists and engineers
- Goal #4.** Improved achievement in mathematics and science skills needed by all Americans

According to NSF's GPRA strategic plan, all HRD programs are more specifically associated with Goals # 3 and # 4. The National Science Foundation's (NSF) also responds to the

GPRA goal of making discoveries at and across the frontiers of science and engineering through the Centers of Research Excellence for Science and Technology (CREST) program.

Beyond these goals, there are several other directions that the NSF and EHR are pursuing concomitantly: advanced technology education, knowledge and distributive intelligence, infusing technology into teaching and learning, education for the future, and promoting collaborations and partnerships. Within the Human Resource Development (HRD) Division, the goals are manifested in many strategies that focus on increasing the participation of individuals from groups underrepresented in the nation's SMET education and research enterprise.

Because of Congressional passage of the Government Performance and Results Act (GPRA) of 1993, commencing in FY 1999, NSF's budget requests must be *outcome-based*. This means demonstrating how initiatives and programs fulfill the relevant goal of the NSF Strategic Plan, "*excellence in science, mathematics, engineering and technology education (SMETE) at all levels,*" and value yield to the American public. During this time of accountability (measurement, interpretation, documentation of the progress of the projects), all programs and projects must demonstrate explicit, timely, and comprehensive responses to queries that bear on the returns on investments made under the rubric of NSF's programming.

Divisional Objectives

To meet the national and global demand for a competent, contributing, well-informed, and science-literate human resource pool, capable of proficiency in the continual rapid advances in science and technology, the HRD Division has established the following objectives: (1) increase the presence of women and girls in scientific and technical careers; (2) increase the representation of minority individuals and other students who do not perform well in SMET areas, through comprehensive and systemic initiatives; (3) increase the number of persons with disabilities participating in science, engineering and mathematics; and (4) strengthen the research and education capabilities of academic institutions with predominantly minority student enrollments. HRD minority-focused programs are directed toward the overall NSF goal of producing a substantial increase in the number of baccalaureate and doctoral degrees earned annually by underrepresented minorities in SMET disciplines. Overall, HRD programs are designed to make a marked difference over the next decade in increasing the output of students, including minorities, women and girls, and persons with disabilities in implementing short-term interventions and stimulating long-term systemic changes in the education and research infrastructure for all students.

Divisional Portfolio

The Comprehensive Partnerships for Mathematics and Science Achievement (CPMSA) Program was established in 1992 with grants to four public school districts involving 49,329 students in grades K - 12. In both FY 1996, and FY 1997 seven CPMSA projects were funded, and in FY 1998, four additional projects were funded. There are currently a total of 28 active projects. The total number of precollege students impacted in these school districts is approximately one million.

**HRD'S CPMSA PROGRAM IS REACHING APPROXIMATELY
959,554 STUDENTS IN THE K-12 SECTOR**

The Alliances for Minority Participation (AMP) Program is a multidisciplinary comprehensive undergraduate program. The program initiated six projects in 1991 with an undergraduate enrollment of 40,834 students in science and engineering disciplines. In 1998 AMP projects impacted over 182,368 undergraduate students. No new projects were added in FY 1998.

HRD'S AMP PROGRAM IS REACHING 182,368 MINORITY STUDENTS

The Centers of Research Excellence in Science and Technology (CREST), showed an increase in the production of **doctoral degrees** earned by minorities in science and engineering from five in 1991, to 19 in 1995, and to 29 in 1997. In FY 1998, the CREST program continues to impact approximately 4,000 undergraduate and graduate students and faculty members.

HRD'S CREST PROGRAM FOR MINORITY INSTITUTIONS IS REACHING OVER 4,000 STUDENTS AND FACULTY.

The Program for Women and Girls in Science, Engineering and Mathematics include Implementation and Development Projects (IDPO)/(IDPU) and Information Dissemination Activities (IDA) funded a total of 20 new projects in FY 1998 which means that the program is impacting more than 109,954 women and girls.

HRD'S PROGRAM FOR WOMEN AND GIRLS IS REACHING OVER 109,954 PARTICIPANTS WITH ITS IDP AND IDA PROJECTS.

The Programs for Persons with Disabilities (PPD) In FY 1994, more than 80 persons with disabilities participated directly in PPD-supported SMET projects. More than 47,000 individuals participated in PPD-supported activities in FY 1995. In FY 1996, 1997, and 1998 over 50,000 individuals have participated or obtained Program information from videos shown to the public, television broadcasts, National Public Radio, and Internet databases.

HRD'S PROGRAM FOR PERSONS WITH DISABILITIES IMPACTED APPROXIMATELY 50,000 PERSONS IN FY 1998

HIGHLIGHTS

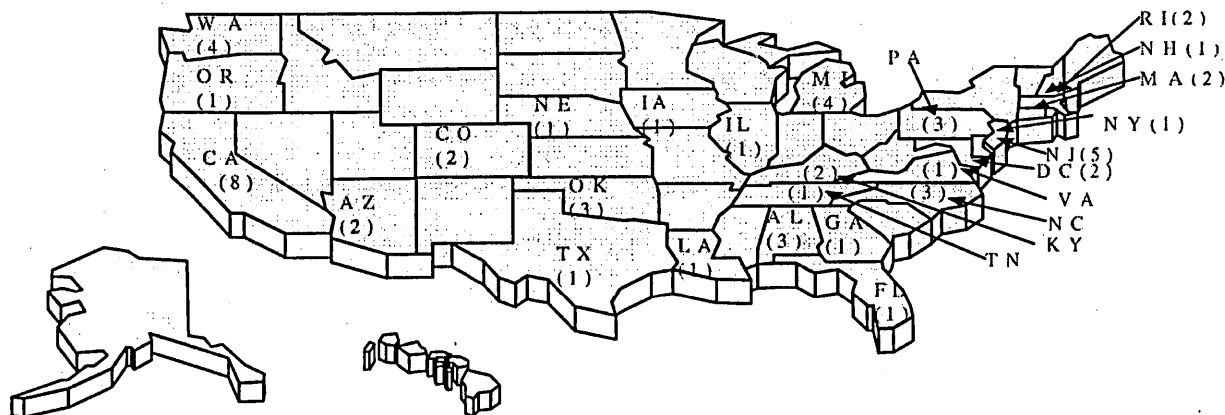
Presidential Awards For Mentoring

In April 1996, the White House announced a new Presidential awards for mentoring program which is administered by the Human Resource Development Division in the Education and Human Resources Directorate of the National Science Foundation (NSF). The Presidential Awards for Excellence in Science, Mathematics and Engineering mentoring (PAESMEM) Program is an outgrowth of the National Science Policy announcement in August 1994 and addresses two goals: (1) to produce the best scientists and engineers for the 21st Century; and (2) to raise scientific and technological literacy of all Americans.

The awards under this Program recognize outstanding mentoring efforts or programs that enhance the participation of underrepresented groups in science, mathematics, and engineering at K-12 through the graduate level. In the Program, up to 10 individuals and 10 institutions may qualify annually for the award, which includes a \$10,000, grant for each awardee. President Clinton said the following in his commencement address at Morgan State University: "Science can serve the values and interests of all Americans, but only if all Americans are given a chance to participate in science." In FY 1998, a total of eight institutional and ten individual awards were made. Since the beginning of the program a total of 65 individuals have been recognized with PAESMEM

In response to the Call for Nominations in FY 1998, 57 nominations were submitted to NSF. Among the submissions, approximately 77 percent (44) focused on individuals, and the remaining 23 percent (13) focused on institutions and organizations. Nominations were submitted from 25 states and the District of Columbia (See Map below). Almost all educational levels were represented among the nominations, which included formal as well as informal educational organizations.

Geographic Distribution of FY 1998 Applications to the PAESMEM Program



Quality Education for Minorities (QEM) Network

The HRD Division supported a special project for the Quality Education for Minorities (QEM) Network for the eighth summer. In the summer of 1998 this project provided opportunities for a total of seven undergraduates to work with mentors at NSF: five were in HRD and two were in REC.

Centers of Excellence for Research, Teaching and Learning (CERTL)

The National Science Foundation (NSF) and the National Institutes of Health (NIH) supported six new CERTL projects in FY 1998 and continued support for 11 projects under a Memorandum of Understanding (MOU) between the two agencies. The goals of the program activity are to develop a strategy to enhance the preservice and inservice training of science and mathematics teachers; help make the precollege standards-based science curriculum effective for learning; develop new paradigms for research on teaching and learning at K-12 levels; and provide student laboratory experiences that enhance both learning and interest in science. The one-year CERTL awards provide up to \$200,000 in direct costs plus indirect costs. A CERTL brochure, which highlighted the program goals and objectives, as well as, the accomplishments of individual projects was published.

Virtual Institutes (AMP)

Continuing support was awarded to the Virtual Institutes, which provide a framework needed to implement SMET Educational Technology Transfer. The AMP institutions having the greatest success in implementing and evaluating AMP initiatives will continue to assist other AMP projects and Non-AMP institutions in developing and implementing effective AMP activities and best practices. The AMP program continues to focus on the regions that contain large concentrations of targeted groups. However, AMP can influence the SMET education programs of the remaining non-AMP institutions that graduate around 40% on the targeted population but are not in regions suitable for developing a strong alliance. Six of the strong AMP lead institutions have taken the initiative in developing six different components that fall under one umbrella.

Virtual SMET Education/Research Technology Transfer Institute for AMP Schools

Lead AMP Institution	Title of Component
Arizona State University	Using the Internet to Develop Distant Cooperative Learning Strategies
City Univ. of New York	Urban Alliances
Oklahoma State University	AMP Retention Studies
Texas A&M University	Community College Articulation and Credit Transfer
Univ. of Alabama – Birmingham	Pre-Service Teacher Preparation Reform
University of Puerto Rico	Curriculum Revision and Effective Teaching Strategies
Univ. of Texas at El Paso	Formative Evaluation and Best Practice Transfer

Minority Graduate Education (MGE) Program

The goal of the MGE program is to increase the number of minority students pursuing advanced study, obtaining doctoral degrees, and entering the professorate workforce in SME disciplines. Institutions participating in this program are expected to engage in comprehensive cultural change that will lead to a sustained increase in the conferral of SME doctoral degrees significantly exceeding historic levels of performance. The MGE program was initiated in FY 1997. Doctoral degree granting institutions in the U.S. and its territories or consortia of such institutions composed of a graduate institution and one or more partner undergraduate institutions were eligible for support. In response to the Program Announcement and the request for proposals, 47 proposals were received and 8 Institutional Awards were made. In addition, one Research on Practice Award was made to the American Association for the Advancement of Science (AAAS). The main purpose of the Research on Practice award is to identify and disseminate successful strategies that lead to increased minority representation in SME doctoral programs and SME-related careers, especially the professorate. All of these awards were made as cooperative agreements for duration of up to five years.

Historically Black Colleges and Universities (HBCU) Initiative

A new initiative targeting HBCUs was announced and implemented in FY 1998. The expressed purpose of this initiative is to strengthen SEM education and research infrastructure, including support for faculty, research experiences for undergraduates and scientific instrumentation at HBCU institutions. The HBCU Initiative will support activities that address historical underrepresentation of minorities in baccalaureate and doctoral degree ranks in science, engineering, and mathematics (SEM). In response to a "Dear Colleague" letter from the Assistant Director, EHR, 14 proposals were received and 3 awards were made as cooperative agreements. The institutions receiving awards were Southern University at Baton Rouge, Morgan State University, and Morehouse College.

FY 1998 HRD BUDGET AND PROGRAM FISCAL DATA Operating Plan(s)(\$Millions)

Program	Final Operating Plan*	Percent of Budget	Modified Operating Plan**	Percent of Modified Budget
CMPSA	13.33	17.95	13.33	16.65
AMP	26.043	35.08	26.043	32.54
CREST	8.06	10.86	8.06	10.07
MIE	2.5	3.37	2.5	3.12
MGE	4.881	6.57	4.881	6.10
PWG	9.22	12.42	9.22	11.52
POWRE	5.85	7.88	5.85	7.31
PPD	4.352	5.86	4.352	5.44
HBCU INIT	-	-	5.802	7.27
TOTAL	\$74.236		\$80.038	

Staffing Summary and Needs FY 1998

Category of Employee	Number of Staff			S/E and IPA Resources	Dollars (Thousands)
	# Auth.	# On-Hand	Recruitment		
FTE Personnel:				S/E Expenditures:	
Administrative	7	6	1	Overtime	0
Program	5	4	1	Awards/Bonuses	\$3,237
Science Assistant	0	0	0	Travel	\$17,446
Technical Support	0	0	0	Training	\$3,583
Clerical	0	0	0	Computing Equipment	\$12,295
Other (Detail Prg. Dir.)	N/A	1	N/A	General Administrative	\$7,513
Total	13	11	2	Total	\$44,074
IPA Personnel:				IPA Expenditures:	
Administrative	N/A	0	N/A	Salaries, Per Diem, etc.	\$391,340
Program	N/A	5	N/A	Travel	\$400
Total		5		Total	\$391,740
Off-Site Contractors:					
Program Support	0	0	0		
Computer Support	0	2	0		
Other Technical Support	0	1	0		
Total	0	3	0		
On-Site Contractors:	N/A	N/A	N/A		
Total					

SUMMARY PROGRAM OPERATIONS FY 1998

Program	FY 1998 Operating Plan	FY 1999 Mortgage	FY 2000 Mortgage	# Prelim. Proposals	# Full Proposals	# New Awards	Success Rate	# CGI's
W&G	\$9.216	\$5.414	\$3.440	N/A	86	20	21%	29
CPMSA	\$13.330	\$10.605	\$12.415	N/A	10	4	40%	21
AMP	\$26.043	\$21.955	\$16.832	N/A	7	3	40%	27
CREST	\$8.060	\$7.878	\$5.779	17	13	3	30%	8
PPD	\$4.352	\$2.663	\$2.089	110	56	17	30%	9
POWRE	\$0.456	0	0	N/A	24	8	33%	0
MGE	\$4.881	\$3.164	\$4.121	60	47	9	19%	0
HBCU	\$5.809	0	0	20	14	3	21%	0
MIE	\$2.500	N/A						
PAESMEM	\$0.369	N/A						
NIH	\$3.500	N/A						
NIEHS	\$0.619	N/A						
VA	\$0.032	N/A						

Funding Profile (In Millions)

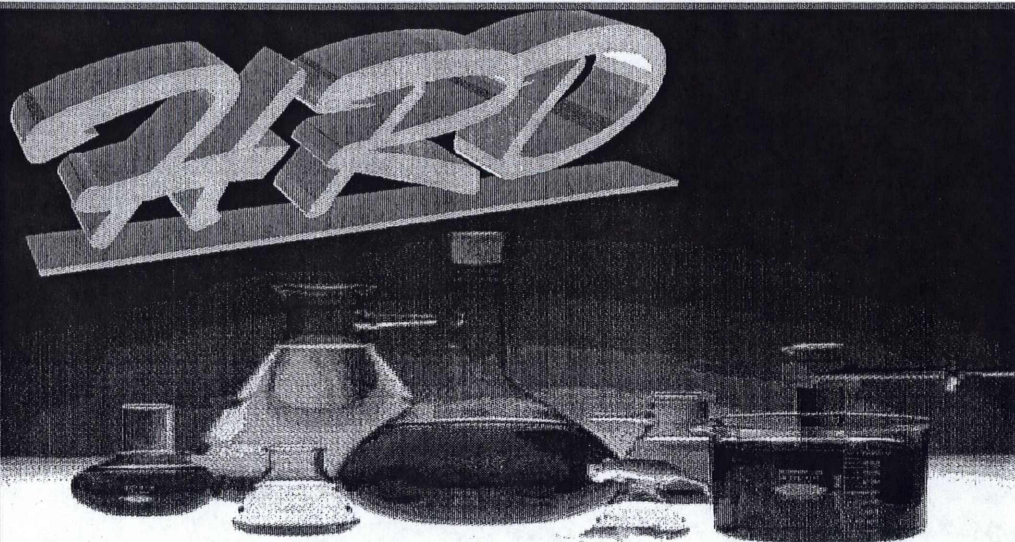
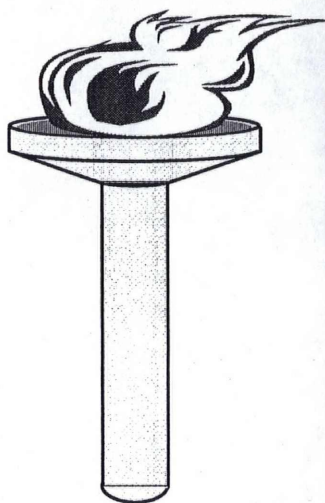
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VA	\$0.032	N/A						

Funding Profile (In Millions)



AMP



*The Alliances for Minority
Participation Program*

Division of Human Resource Development

PROGRAM DESCRIPTION

Program Goals

The Alliances for Minority Participation (AMP) Program is a multi-disciplinary comprehensive undergraduate program. The goals for the AMP program in concert with the Government Performance and Results Act (GPRA) are:

- To substantially increase the quantity and quality of students receiving baccalaureate degrees in science, mathematics, engineering, and technology (SMET) using reliable indicators by which progress is measured.
- To increase the number of underrepresented students entering SMET disciplines, graduate schools and attaining a doctorate degree in these fields.
- To help provide a diverse globally-oriented workforce of scientists and engineers.

Program Portfolio

The AMP program currently supports 27 alliances via cooperative agreements. AMP projects receive up to \$1,000,000 per year for five years depending on the level of performance. The program has a geographical spread from New York to California, Montana to Florida and Puerto Rico, and through the heartlands of America (Ref. Map).

Project Effectiveness

The goal of Program Effectiveness Reviews (PER) is to gain a better understanding of the appropriately documented, effectively measured, significant and reliable indicators by which progress is assessed according to the program objective(s), design and implementation strategies, and the financial resources expended. PER represents a long-term effort to evaluate the AMP Program at the national level. The 1997 report provided an assessment and suggestions on the effectiveness of AMP.

For the AMP program, PER uses the following indicators of progress (or effectiveness elements) to gauge the performance of each project:

1. Value-added for inter-institutional programming
2. Coherence of program
3. Number of graduates by fields including delta from baseline
4. Student performance
5. High school and community college articulation agreements
6. Student support programs
7. Academic performance indicators and, assessment
8. Evidence of institutionalization
9. Teacher preparation
10. AMP institutional share of the minority SMET pipeline

To report on the effectiveness of each AMP project and the overall effectiveness of the AMP program in achieving their goals, both qualitative and quantitative data were collected via the AMP program's three phase review process. As a part of this process, each AMP submits detailed annual progress reports, arranges for site visits by NSF program officers and SMET education experts, and participates in reverse site visits. Qualitative analyses were done on written materials submitted by alliances, including project descriptions, annual reports, brochures, announcements, newsletters and videos.

1. "Value Added" For The Inter-Institutional Programming

AMP higher education institutions have shown how inter-institutional programming can provide a "value-added" element to SMET higher education systems by removing redundancy in program development by: sharing information on both successful and unsuccessful SMET reform strategies; uniting to gain the support of both local politicians and business leaders; and by providing a safety net for students to ensure that useful and timely information is more prove accessible. This section highlights common AMP program activities. For specific activities, see Appendix B. Some common examples that are evident in most alliances are:

AMP Joint Recruitment Strategies. The objectives of the AMP joint recruitment strategies are to ensure smooth transitions at all educational levels (i.e. high school to college, community college to four-year college, and undergraduate to graduate school).

Because of AMP, partner institutions are providing students with recruitment materials on all institutions in an alliance during recruitment visits. AMPs are using joint recruitment strategies to encourage more pre-college students to consider SMET majors. For example, many alliances tell high school students that if they do well in their studies, they will have the knowledge to access higher education. This provides early incentives for students to consider and others to continue in SMET fields of study

Joint recruitment strategies have proven very helpful for community colleges. Community colleges can guarantee students that if they enroll in a community college campus and do well in their studies, they will have a smooth transition to a four-year degree-granting institution with a major in some SMET discipline.

To complete the pipeline, AMP institutions promise high achievers that if they do well in their undergraduate programs, \$10,000 to \$20,000 graduate assistantships in SMET areas are available for them to continue their SMET education. Most AMPs found that there is a general lack of knowledge among minority undergraduates about the mechanisms available to support graduate study. AMP is changing this condition.

SMET Institutional Reforms. AMP projects establish credibility by ensuring that each partner understands, adopts, and implements a common set of metrics that AMP uses to gauge the effectiveness and efficiency of partner SMET teaching and learning processes. These metrics include monitoring (1) graduation rates, (2) progression rates (retention rates), (3) access to quality undergraduate research experiences, (4) discipline specific time to-degree fractions, and (5) student performance in "gatekeeping" SMET courses (for some alliances, project director's (PD) monitor the average number of times students take basic courses). Alliances use these metrics not only to determine which activities are most needed but, once implemented, the metrics are used to monitor the activities' effectiveness. After several years of experience with the AMP program, AMP projects learned that comprehensive SMET institutional reform strategies should involve the following core student supportive elements:

- **Coherence of Program.**

One of the major strengths of the AMP program is its requirement that projects implement inter and intra- institutionally comprehensive coherent strategies. The AMP program requires partners to address curriculum reform while also examining non-curricula issues that limit minority student participation in SMET. These objectives cannot be accomplished without involvement of students, faculty, administrators, and SMET business leaders in the planning and implementing of AMP projects. The key element in the success of this strategy is effective leadership from the CEO of partner institutions provided via the presidents' involvement on the AMP governing board. Usually the more effective the AMP the more involved and supportive the governing board.

AMPs found that while presidential involvement is critical, it is not sufficient. AMPs using the metrics stated above employed the following elements to ensure the acceptance and coherence of their projects:

- **Faculty working groups.**

Most AMP projects address curricula reform by establishing discipline specific faculty working groups and charging them to reform their curriculum in an outcome oriented manner. From California to South Carolina and from Florida to New York, AMP faculty working groups are bringing together faculty from two- and four-year colleges and universities to consider how to best help students learn SMET. These working groups established and reformed curricula that yielded outstanding outcomes on some campuses.

- **Administrative Working Groups.**

Some policies that negatively affect AMP are best handled at the deanship level. In New York, the deans from partner institutions meet monthly to discuss the AMP strategy. This not only assisted in the implementation of AMP, it also catalyzed the search for additional funds to support AMP objectives.

- **Student Groups.**

Most AMPs have AMP institutional and alliance-wide student groups. These groups help in all aspects of the AMP program especially in peer mentoring and in pre-college recruiting. Most AMP projects use first-year students to recruit other students from their secondary schools by encouraging the students to visit their former schools during college breaks and talk with prospective minority SMET students. Since the NSF/AMP budget is not large enough to support these initiatives, AMP is catalyzing coherent uses of funds from all sources in addressing diversity concerns and assisting institutions in better coordinating their human resource development activities. Examples of coordinated human resource development activities follow:

- The Alabama AMP has a collaborative agreement with the Alabama DOE/EPSCoR Program whereby students work in DOE/EPSCoR Research Clusters on energy-related research at the University of Alabama and Auburn University.
- The Mississippi Institutions of Higher Learning established a Statewide Student Achievement Awards Luncheon to recognize outstanding student achievements in the AMP program.
- The Puerto Rico AMP has established multi-campus alliances to develop and implement strategic plans to improve the effectiveness of the SMET teaching/learning culture.
- Twice a month the New Mexico AMP electronically disseminates information to its partners on significant accomplishments in a one-page bulletin called "AMP Currents".
- The Howard AMP reallocates its budget to address areas of greatest student needs based on its pipeline report or projects analyses.
- California State AMP, and California AMP developed a unified, student resume databank. Students from both alliances present their qualifications to researchers throughout the two university systems. Through this mechanism students are receiving greater opportunities to participate in research.
- The Texas A&M AMP established a partnership between the colleges of Science and Education to address improving SMET pre-service teacher preparation.
- The City University of New York AMP program supports "The Pipeline Program" for careers in College teaching and research sponsored by the Diamond Foundation and implemented the following committees: AMP Steering Committee (academic deans), Activity Coordinator's Committee, Course Restructuring Committee, Mathematics Department Chairs Committee, and individual campus Committees.

Issues

AMP PER RECOMMENDATION. Data indicate that the NSF's AMP program is contributing to the increase in the number of students from groups who are underrepresented in SMET fields who earn a baccalaureate degree. Activities implemented because of the AMP program are being institutionalized. To maximize the impact of the AMP program, the following strategy is proposed below:

EXPAND THE NUMBER OF ALLIANCES. The NSF AMP program currently supports 27 alliances. The program should consider careful expansion to no more than 30 alliances. There are two regions with significant minority student populations that underserve those populations in SMET disciplines. The target regions are: Houston, TX and New England States. Houston has been declined three times in its attempt to secure AMP funding. NSF, via its merit review system, determined that this project suffers from poor project leadership. As was recommended by the reviewers, NSF should continue to meet with the interested parties in Houston to define NSF's goals and objectives and give the project an additional opportunity to respond. NSF/AMP officers have met with representatives from the New England Region, however, they have yet to submit an application.

Highlights

Increased Involvement of Community Colleges. AMP projects are increasing the involvement of community college faculty with 4-year college faculty to ensure that transfer mechanisms are student friendly. Community college and 4-year college members are working collaboratively to develop effective strategies to achieve objectives.

Summer Bridge Program. AMPs have developed programs that greatly enhance student progression rates by providing students with solid content and basic study skills needed to successfully bridge through their freshman year of college. As was reported in 1997, the AMP program is responsible for the development of a textbook by M. F. Moriarty (California AMP) which is used in summer bridge programs.

Courses and Curriculum Reform Efforts. While course and curriculum reform activities are an ongoing activity for most higher education institutions, institutional partners in the AMP program are working together to identify areas that are unnecessarily limiting the involvement of minority students in SMET fields. Activities range from organizing all faculty that teach introductory SMET courses in an alliance to meet and develop reform activities to develop new materials to support new or revised courses such as the new technical writing textbook developed for first year college students. Working within an AMP makes curriculum reform a less stressful activity.

Expanded Research Experiences. The involvement of undergraduates in research projects is encouraged to ensure that students gain a good understanding of the type of research and work SMET professionals perform. This provides the students with a means to address their financial need without having to acquire a job outside their discipline. Further, these experiences play a large role in successful matriculation in graduate school.

New Evaluation Activities. The AMP projects are using AMP evaluation data to fuel reform. While college presidents are challenged when confronted with their institution's performance relative to others in the system, this activity provides a strong motivator for addressing progression rates.

Coordination With Non-Academic Partners. While AMP is placing many students with summer SMET employers, with the exception of Hewlett Packard and Texas Instruments, few companies are making large commitments of resources of money to non-company related activities. This is a challenge.

Other Federal Agencies. AMP is working collaboratively with NIH, NASA, USDA, and other federal agencies. Unfortunately, the issue of who gets credit for student or institutional achievement may still be preventing our ability to better serve students.

Management and Operations

In FY 1996, a comprehensive project review procedure that involves the following three steps was implemented: (1) site visit (developed site visit technical review worksheets); (2) annual program report format - monitoring and reporting system (MARS). MARS is a self-contained computer-based system that allows the awardee to report to the NSF using an electronic format; and (3) reverse site visits. The AMP program has developed a web database information system designed to grant easy access via the Internet to data stored in AMP MARS called ReACT and ProACT.

Number of graduates by field including delta from baseline

Each AMP project established challenging SMET baccalaureate degree goals. To achieve their goals, AMP projects established initiatives to increase enrollment and to increase the retention and progression rates for new and continuing students. AMPs are required to report annually to NSF their incremental progress in achieving their goals. The cohort that began in 1991 reports minority SMET enrollment increasing from 35,670 in 1991 to 52,374 in 1997; this represents a 47% increase over a six-year time span (See figures 1 and 2). Similar increases are observed for more recent cohorts. Total minority SMET enrollment increased by 5.6% in all cohorts between the 1996 and 1997 school years. During this period the '93 cohort exhibited a 12% increase followed by a 9.5% increase by the '92 cohort.

Science, mathematics, engineering, and technology (SMET) enrollment data are also collected for individuals from racial and ethnic groups underrepresented in the SMET workforce. To address these indicators, data from the AMP-MARS electronic data collection system, the AMP PER reports, and the National Center for Educational Statistics' IPED reports were used. Recent increases were achieved in the production of SMET B.S. degree majors particularly in engineering fields from groups currently underrepresented in SMET fields.

To establish a bona fide baseline, NCES' IPED SMET data were secured for AMP institutions starting with 1985 and continuing to 1993. Each year's data for each cohort was compared to the baseline year data for that cohort. These data reveal that AMP institutions experienced a significant increase in B.S. degree productivity in years following their initial AMP award. Two '91 Cohort alliances achieved B.S. productivity gains that exceed 100%; these are the Puerto Rico Alliance (189%) and the Mississippi Alliance (105%).

Student Performance. As measured by progression rates, AMP institutions report that student performance has been positively affected by the AMP program. The California State AMP reports retention rates for summer bridge program participants of 81% for first year students. The Western Alliance reports an overall freshmen and sophomore retention rate of 77%. The retention rates for the freshman to sophomore transition in math and chemistry are 100% while the retention rate for life sciences is 91%. At the University of Texas AMP 74% of the 238 community college students that participated in the Alliance Summer Bridge Program successfully transferred to four-year universities; 72% (127) are still in SEM fields and 11% graduated with SEM degrees. The California State AMP reports that over 80% of AMP Summer Bridge Program participant freshmen were retained through their freshman year. The UTEP AMP reports that all students who participated in AMP-related research at UTEP in 1993 have graduated.

Group learning strategies, peer mentoring, senior faculty teaching lower level courses, publishing disaggregated retention and course passing rates, "drop in" tutoring centers, and other activities impact student performance. **These results exist because AMP projects implement activities that are open to all students, but are specifically designed to target minority students.** In fact, the Puerto Rico AMP has divided student performance into three performance tiers and developed strategies for each tier.

High school and Community College Articulation Agreements. Most AMP institutions have developed strong partnerships with community colleges. Because AMPs have involved SMET faculty from both community colleges and four-year institutions in developing bridge programs and curriculum reform efforts, existing articulation agreements have been refined and new ones have been established. Some examples include the:

- University of California AMP has established a community college summer institute for prospective SMET students;
- Mississippi AMP project implemented a community college bridge program in 1996 with funds from GTE;

- California State University AMP reported a 7.7% increase in the number of students who transferred from community colleges to California State University System institutions with a major in a SMET discipline;
- Texas A&M AMP reports implementing special AMP transfer procedures and a special transfer assistance center; and
- City University of New York AMP reports fully establishing the Transfer, Retention, and Achievement at City College (TRACC) program which improves the retention of community college students in SMET fields.

Because of AMP, more community college students are transferring into four-year institutions with SMET majors. Individual AMP projects are developing means for better recording and reporting transfer progressions rates. One AMP project has submitted a request to establish a national AMP community college dissemination network.

Evidence of Institutionalization. AMP PDs view their activities as providing solutions, therefore any activities that do not merit the support of the individual campuses cannot be internally institutionalized. AMP projects know that one requirement of NSF is that faculty and administrators become involved with activities from the beginning so that once NSF funds end, successful activities are institutionalized. The drop-in centers in the Alabama AMP are now supported by on campus funds. The AMPs in Mississippi, California, South Carolina, Florida, City University of New York, New Mexico, and the California State University System report direct support from their state or local governments for their AMP program.

Another indicator of the level of institutionalization of AMP activities is the level of cost sharing. The Alabama AMP and California AMP proposed Phase II AMP cost-sharing exceeding \$10 million. The Florida Legislature is committed to providing significant support to the Florida-Georgia AMP. The California State AMP matched NSF support at a rate of almost three to one.

Because of AMP, many projects report securing additional funds from NASA, DOD, DOE, NIH and other federal agencies. AMP also encourages more effective use of campus funds. Ninety percent of Puerto Rico AMP NSF funds support participant costs. Some learning skills laboratories are being revised with campus funds to place a greater emphasis on the needs of SMET students.

AMP Monitoring and Reporting System (MARS) for Data Collection System and the EHR Impact Data Base. Considering the complexity of the challenge, a great deal of credit must be given to Quantum Research Corporation (QRC) and others who helped design and implement the database system. This includes the staff of QRC and those who contributed data at the individual institutions. The web-based AMP MARS, collects data on the description of students, activities, enrollment and graduation rates. Currently, the data base contains information on over 350 institutions. The information contained in the database constituted a limited, but still useful, evaluation tool that can be employed in the evaluation of AMP at the program and project levels.

Program Analysis. Data provided to NSF annually by the AMP projects via the Internet indicate that projects experience significant increases in the number of baccalaureate degrees awarded to individuals from groups currently underrepresented in SMET fields after their second "full" year of AMP funding. While many projects report large increases after the first few months of AMP funding, these increases are due to the work of institutions in identifying students who have already met most of the requirements for graduation and who need a "push" to complete their B.S. degree program. AMP provides that added push, but this type of activity cannot be depended on to continue to produce the required numbers.

Project Analysis. Most alliances, have met their first five-year goals, are on-track to meet their goals, or have been restructured to have a greater likelihood of goal attainment. Even in those alliances where numerical goal attainment will be difficult, the program has had the effect of providing significant increases in the participation rates for minority students.

Expanding the role of doctoral degree granting institutions in the AMP program. The Leadership Alliance (A non-NSF supported alliance of "Research I" institutions) has submitted a non-competitive AMP proposal. However, the institutions involved in this alliance could be a valuable resource to assist in increasing the number of individuals from groups underrepresented in SMET at the doctorate level. A partnership could be established between AMPs and the Leadership Alliance at both the individual institutional levels and the coordinating unit levels to ensure that:

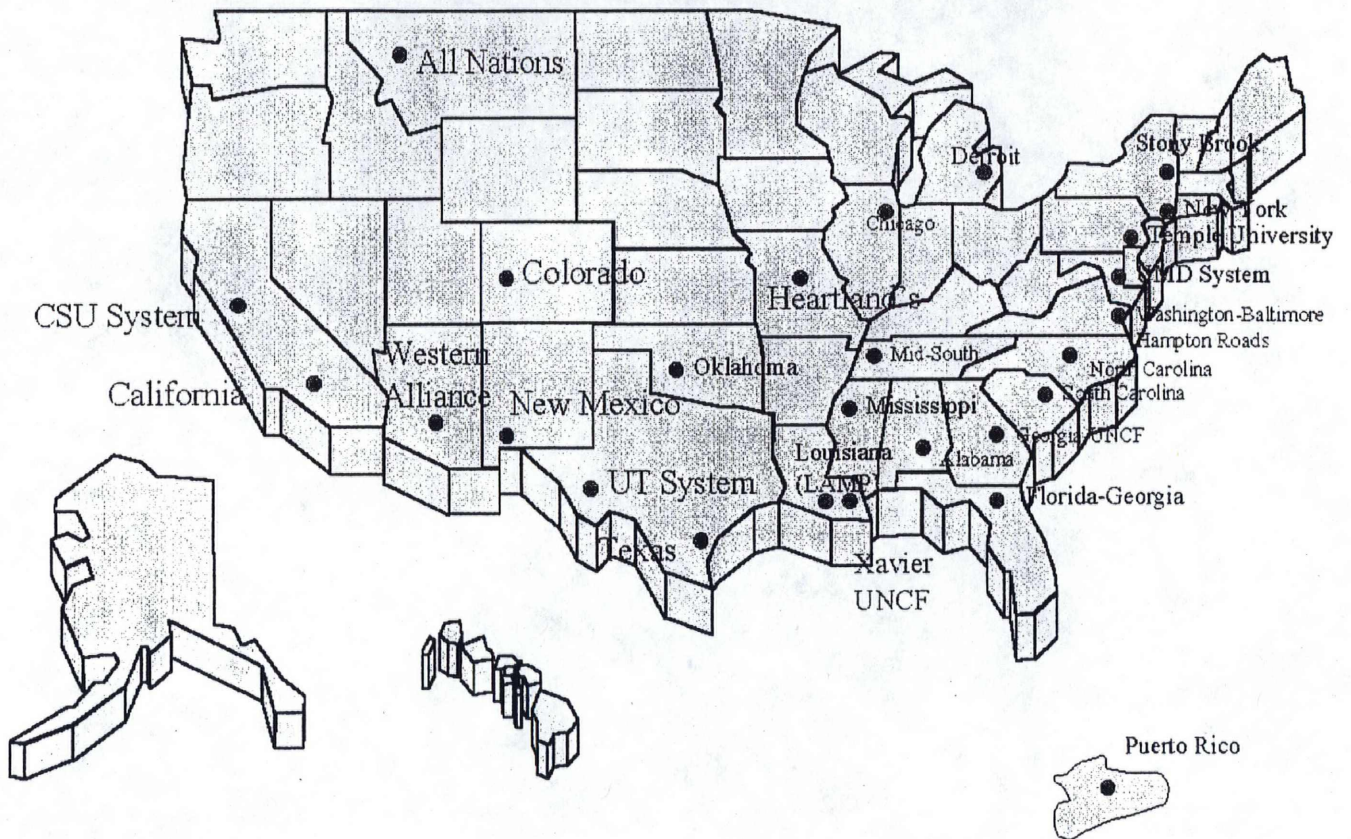
- AMP students who are admitted into graduate programs are assured financial support in the form of an assistantship or fellowship,
- AMP students are recruited into their graduate programs,
- AMP institutions and Leadership Alliance partner institutions jointly monitor the progress of AMP students in Leadership Alliance partner institutions,
- AMP students are provided pre-graduate school summer research opportunities on Leadership Alliance campuses,
- AMP and Leadership Alliance institutions develop graduate school summer bridge programs, and
- Leadership Alliance institutions offer, via distant learning means, curriculum enhancement courses to AMP students on their home campuses.

While many of the above ideas are not new, the networking of effective NSF projects with "Research I" institutions would provide additional incentives for students to continue in SMET educational activities. Similar type partnerships should be established between AMP projects and other large-scale NSF supported research Centers and Institutes.

AMP funding per aggregate degree production capacity has been adjusted to better reflect current and expected SMET degree productions. Until recently, all AMPs were funded up to \$1,000,000 per year for five years. For large projects (those that annually graduate more than 500 students with B.S. degrees in SMET fields), the funding limitation causes challenges to the institutions in meeting the needs of most of its targeted students and for smaller projects (those that awards 300 or less degrees) the funding allows the projects to award a relatively large number of scholars. This untenable situation has been corrected. The AMP program will continue to ensure that each project is funded in a cost-efficient manner by adjusting the funding levels as shown below:

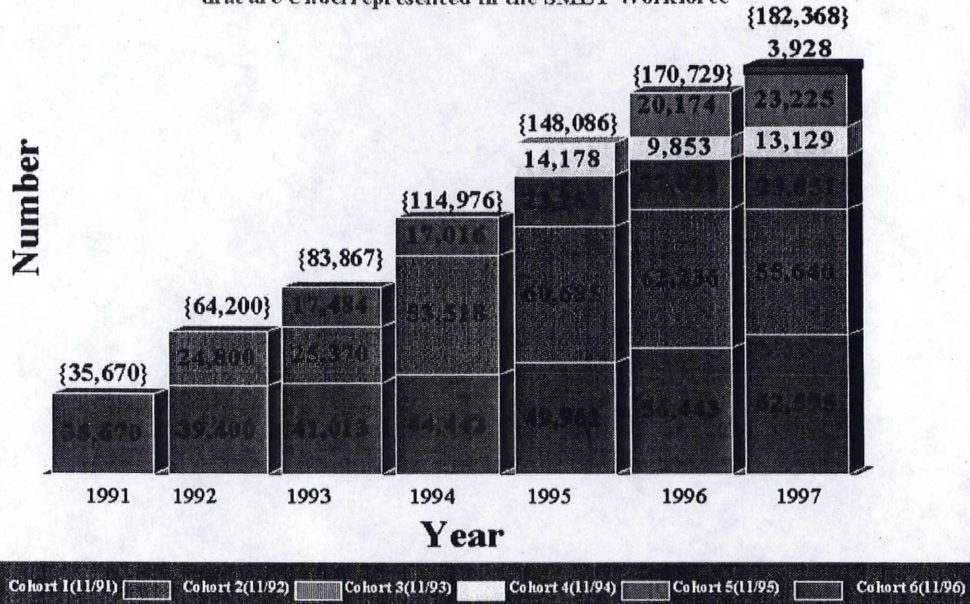
- \$1,000,000 or more for projects that award 500 or more B.S. degrees annually;
- \$500,000 to \$700,000 for projects that award between 300 and 500 B.S. degrees annually;
and
- less than \$500,000 for projects that awards 300 or less B.S. degrees annually.

The National Science Foundation Alliances for Minority Participation



The Alliances for Minority Participation Program

SMET Enrollment for Individuals from Ethnic and Minority Groups that are Underrepresented in the SMET Workforce



The Alliances for Minority Participation Program

SMET Minority B.S. Degree Production

