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2^D SESSION

H. R. 3130

IN THE SENATE OF THE UNITED STATES

JULY 11 (legislative day, JULY 10), 2002

Received; read twice and referred to the Committee on Health, Education,
Labor, and Pensions

AN ACT

To provide for increasing the technically trained workforce
in the United States.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Undergraduate
3 Science, Mathematics, Engineering, and Technology Edu-
4 cation Improvement Act”.

5 **SEC. 2. FINDINGS.**

6 The Congress makes the following findings:

7 (1) Studies show that about half of all United
8 States post-World War II economic growth is a di-
9 rect result of technological innovation, and science,
10 engineering, and technology play a central role in
11 the creation of new goods and services, new jobs,
12 and new capital.

13 (2) The growth in the number of jobs requiring
14 technical skills is projected to be more than 50 per-
15 cent over the next decade.

16 (3) A workforce that is highly trained in
17 science, mathematics, engineering, and technology is
18 crucial to generating the innovation that drives eco-
19 nomic growth, yet females, who represent 50 percent
20 of the United States population, make up only 19
21 percent of the science, engineering, and technology
22 workforce.

23 (4) Outside of the biomedical sciences, the num-
24 ber of undergraduate degrees awarded in the
25 science, mathematics, engineering, and technology
26 disciplines has been flat or declining since 1987, de-

1 spite rapid population growth and a significant in-
2 crease in undergraduate enrollment over the same
3 period.

4 (5) The demand for H-1B visas has increased
5 over the past several years, suggesting that the
6 United States is not training a sufficient number of
7 scientists and engineers.

8 (6) International comparisons of 24-year olds
9 have shown that the proportion of natural science
10 and engineering degrees to the total of under-
11 graduate degrees is lower in the United States than
12 in Japan, South Korea, Taiwan, the United King-
13 dom, and Canada.

14 (7) Technological and scientific advancements
15 hold significant potential for elevating the quality of
16 life and the standard of living in the United States.
17 The quality and quantity of such advancements are
18 dependent on a technically trained workforce.

19 (8) Reversing the downward enrollment and
20 graduation trends in a number of science and engi-
21 neering disciplines is not only imperative to main-
22 taining our Nation's prosperity, it is also important
23 for our national security.

24 (9) The decline of student majors in science,
25 mathematics, engineering, and technology is report-

1 edly linked to poor teaching quality in these dis-
2 ciplines and lack of institutional commitment to un-
3 dergraduate education as compared to research.

4 (10) Undergraduate science, mathematics, engi-
5 neering, and technology faculty generally lack any
6 formal preparation for their role as undergraduate
7 educators. In addition, faculty members are gen-
8 erally not rewarded, and in some cases are penal-
9 ized, for the time they devote to undergraduate edu-
10 cation.

11 (11) Faculty experienced in working with un-
12 dergraduate students report that undergraduate re-
13 search experiences contribute significantly to a stu-
14 dent's decision to stay in an undergraduate science,
15 mathematics, engineering, or technology major and
16 to continue their education through graduate stud-
17 ies.

18 **SEC. 3. DEFINITIONS.**

19 In this Act—

20 (1) the term “academic unit” means a depart-
21 ment, division, institute, school, college, or other
22 subcomponent of an institution of higher education;

23 (2) the term “community college” has the
24 meaning given such term in section 7501(4) of the

1 Elementary and Secondary Education Act of 1965
2 (20 U.S.C. 7601(4));

3 (3) the term “Director” means the Director of
4 the National Science Foundation;

5 (4) the term “eligible nonprofit organization”
6 means a nonprofit organization with demonstrated
7 experience delivering science, mathematics, engineer-
8 ing, or technology education, as determined by the
9 Director;

10 (5) the term “institution of higher education”
11 has the meaning given such term in section 101(a)
12 of the Higher Education Act of 1965 (20 U.S.C.
13 1001(a)); and

14 (6) the term “research-grade instrumentation”
15 means a single instrument or a networked system of
16 instruments that enable publication-quality research
17 to be performed by students or faculty.

18 **SEC. 4. TECHNOLOGY TALENT.**

19 (a) **SHORT TITLE.**—This section may be cited as the
20 “Technology Talent Act of 2002”.

21 (b) **GRANT PROGRAM.**—

22 (1) **IN GENERAL.**—The Director shall award
23 grants, on a competitive, merit-reviewed basis, to in-
24 stitutions of higher education with physical or infor-
25 mation science, mathematics, engineering, or tech-

1 nology programs, to consortia thereof, or to non-
2 profit entities that have established consortia among
3 such institutions of higher education for the purpose
4 of increasing the number and quality of students
5 studying and receiving associate or baccalaureate de-
6 grees in the physical and information sciences,
7 mathematics, engineering, and technology. Consortia
8 established by such nonprofit entities may include
9 participation by eligible nonprofit organizations,
10 State or local governments, or private sector compa-
11 nies. An institution of higher education, including
12 those participating in consortia, that is awarded a
13 grant under this section shall be known as a “Na-
14 tional Science Foundation Science and Engineering
15 Talent Expansion Center”.

16 (2) REQUIREMENTS.—

17 (A) NUMBER.—The Director shall award
18 not fewer than 10 grants under this section
19 each year, contingent upon available funds.

20 (B) DURATION.—Grants under this section
21 shall be awarded for a period of 5 years, with
22 the final 2 years of funding contingent on the
23 Director’s determination that satisfactory
24 progress has been made by the grantee during
25 the first 3 years of the grant period toward

1 achieving the increases in the number of stu-
2 dents proposed pursuant to subparagraph (E).

3 (C) PRINCIPAL INVESTIGATOR.—For each
4 grant awarded under this section to an institu-
5 tion of higher education, at least 1 principal in-
6 vestigator must be in a position of administra-
7 tive leadership at the institution of higher edu-
8 cation, and at least 1 principal investigator
9 must be a faculty member from an academic
10 department included in the work of the project.
11 For each grant awarded to a consortium or
12 nonprofit entity, at each institution of higher
13 education participating in the consortium, at
14 least 1 of the individuals responsible for car-
15 rying out activities authorized under subsection
16 (c) at that institution must be in a position of
17 administrative leadership at the institution, and
18 at least 1 must be a faculty member from an
19 academic department included in the work of
20 the project at that institution.

21 (D) SUBSEQUENT GRANTS.—An institution
22 of higher education, a consortium thereof, or a
23 nonprofit entity that has completed a grant
24 awarded under this section may apply for a
25 subsequent grant under this section.

(E) INCREASES.—

(i) INSTITUTIONS OF HIGHER EDUCATION WITH BACCALAUREATE DEGREE PROGRAMS.—An applicant for a grant under this section that is or includes an institution of higher education that awards baccalaureate degrees shall propose in its application specific increases in the number of students who are United States citizens or permanent resident aliens obtaining baccalaureate degrees at each such institution within the physical or information sciences, mathematics, engineering, or technology, and shall state the mechanisms by which the success of the grant project at each such institution shall be assessed.

(ii) COMMUNITY COLLEGES.—An applicant for a grant under this section that is or includes a community college shall propose in its application specific increases in the number of students at the community college who are United States citizens or permanent resident aliens pursuing degrees, concentrations, or certifications in the physical or information sciences, math-

1 ematics, engineering, or technology pro-
2 grams or pursuing credits toward transfer
3 to a baccalaureate degree program in the
4 physical or information sciences, mathe-
5 matics, engineering, or technology, and
6 shall state the mechanisms by which the
7 success of the grant project at each com-
8 munity college shall be assessed.

9 (F) RECORDKEEPING.—Each recipient of
10 a grant under this section shall maintain, and
11 transmit annually to the National Science
12 Foundation, in a format indicated by the Direc-
13 tor, baseline and subsequent data on under-
14 graduate students in physical and information
15 science, mathematics, engineering, and tech-
16 nology programs. For grants to consortia or
17 nonprofit entities, the data transmitted shall be
18 provided separately for each institution of high-
19 er education participating in the consortia.
20 Such data shall include information on—

- 21 (i) the number of students enrolled;
22 (ii) student academic achievement, in-
23 cluding quantifiable measurements of stu-
24 dents' mastery of content and skills;

1 (iii) persistence to degree completion,
2 including students who transfer from
3 science, mathematics, engineering, and
4 technology programs to programs in other
5 academic disciplines; and

6 (iv) placement during the first year
7 after degree completion in post-graduate
8 education or career pathways.

9 (G) PRIORITY.—The Director may give
10 priority in awarding grants under this section
11 to applicants whose application—

12 (i) indicates a plan to build on pre-
13 vious and existing efforts with dem-
14 onstrated success, including efforts involv-
15 ing industry, in improving undergraduate
16 learning and teaching, including efforts
17 funded by Federal grants from the Na-
18 tional Science Foundation or other agen-
19 cies; and

20 (ii) provides evidence of a commitment
21 by the administration at each institution of
22 higher education to support and reward
23 faculty involvement in carrying out the
24 proposed implementation plan for the
25 project.

1 (c) USES OF FUNDS.—Activities supported by grants
2 under this section may include—

3 (1) projects that specifically aim to increase the
4 number of traditionally underrepresented students in
5 the physical or information sciences, mathematics,
6 engineering, or technology, such as mentoring pro-
7 grams;

8 (2) projects that expand the capacity of institu-
9 tions of higher education to incorporate current ad-
10 vances in science and technology into the under-
11 graduate learning environment;

12 (3) bridge projects that enable students at com-
13 munity colleges to matriculate directly into bacca-
14 laureate physical or information science, mathe-
15 matics, engineering, or technology programs, includ-
16 ing those targeted at traditionally underrepresented
17 groups in such disciplines;

18 (4) projects including interdisciplinary ap-
19 proaches to undergraduate physical and information
20 science, mathematics, engineering, and technology
21 education;

22 (5) projects that focus directly on the quality of
23 student learning, including those that encourage—

24 (A) high-caliber teaching, including ena-
25 bling faculty to spend additional time teaching

1 participating students in smaller class settings,
2 particularly in the laboratory environment, by,
3 for example, providing summer salary or other
4 additional salary for faculty members or sti-
5 pends for students;

6 (B) opportunities to develop new peda-
7 gogical approaches including the development of
8 web-based course strategies, distributed and col-
9 laborative digital teaching tools, or interactive
10 course modules; and

11 (C) screening and training of teaching as-
12 sistants;

13 (6) projects that—

14 (A) facilitate student exposure to potential
15 careers, including cooperative projects with in-
16 dustry or government that place students in in-
17 ternships as early as the summer following their
18 first year of study;

19 (B) provide part-time employment in in-
20 dustry during the school year; or

21 (C) provide opportunities for undergradu-
22 ates to participate in industry or government
23 sponsored research;

24 (7) projects that assist institutions of higher
25 education in States that participate in the Experi-

1 mental Program to Stimulate Competitive Research
2 (EPSCoR) to broaden the science, engineering,
3 mathematics, and technology student base or in-
4 crease retention in these fields;

5 (8) projects to encourage undergraduate re-
6 search on-campus or off-campus;

7 (9) projects that provide scholarships or sti-
8 pends to students entering and persisting in the
9 study of science, mathematics, engineering, or tech-
10 nology;

11 (10) projects that leverage the Federal invest-
12 ment by providing matching funds from industry,
13 from State or local government sources, or from pri-
14 vate sources; and

15 (11) other innovative approaches to achieving
16 the purpose described in subsection (b)(1).

17 (d) ASSESSMENT, EVALUATION, AND DISSEMINATION
18 OF INFORMATION.—

19 (1) PROJECT ASSESSMENT.—The Director shall
20 require each institution of higher education receiving
21 assistance under this section to implement project-
22 based assessment that facilitates program evaluation
23 under paragraph (2) and that assesses the impact of
24 the project on achieving the purpose stated in sub-

1 section (b)(1), as well as on institutional policies and
2 practices.

3 (2) PROGRAM EVALUATION.—Not later than
4 180 days after the date of the enactment of this Act,
5 the Director shall award at least 1 grant or contract
6 to an independent evaluative organization to—

7 (A) develop metrics for measuring the im-
8 pact of the program authorized under this sec-
9 tion on—

10 (i) the number of students enrolled;

11 (ii) student academic achievement, in-
12 cluding quantifiable measurements of stu-
13 dents' mastery of content and skills;

14 (iii) persistence to degree completion,
15 including students who transfer from
16 science, mathematics, engineering, and
17 technology programs to programs in other
18 academic disciplines; and

19 (iv) placement during the first year
20 after degree completion in post-graduate
21 education or career pathways; and

22 (B) conduct an evaluation of the impacts
23 of the program described in subparagraph (A),
24 including a comparison of the funded projects

1 to identify best practices with respect to achiev-
2 ing the purpose stated in subsection (b)(1).

3 (3) DISSEMINATION OF INFORMATION.—The
4 Director, at least once each year, shall disseminate
5 information on the activities and the results of the
6 projects assisted under this section, including best
7 practices identified pursuant to paragraph (2)(B), to
8 participating institutions of higher education and
9 other interested institutions of higher education.

10 (e) UNDERREPRESENTED GROUPS.—In carrying out
11 the program authorized by this section the Director shall
12 strive to increase the number of students receiving bacca-
13 laurate degrees, concentrations, or certifications in the
14 physical or information sciences, mathematics, engineer-
15 ing, or technology who come from groups underrep-
16 resented in these fields.

17 (f) REPORTS.—

18 (1) LIST.—Not later than 90 days after the
19 date of the enactment of this Act, the Director shall
20 develop, and disseminate to institutions of higher
21 education, a list of examples of existing institutional
22 and government efforts relevant to the purpose stat-
23 ed in subsection (b)(1).

24 (2) INTERIM PROGRESS REPORT.—At the end
25 of the third year of the program authorized under

1 this section, the Director shall transmit to the Con-
2 gress an interim progress report of the evaluation
3 conducted under subsection (d)(2).

4 (3) FINAL REPORT.—Not later than 6 years
5 after the date of the enactment of this Act, the Di-
6 rector shall transmit to the Congress a final report
7 of the evaluation conducted under subsection (d)(2).

8 (g) ADVISORY COMMITTEE.—

9 (1) ESTABLISHMENT.—The Director shall es-
10 tablish an advisory committee, that includes signifi-
11 cant representation from industry and academic
12 leaders, for the grant program authorized under this
13 section. The advisory committee shall—

14 (A) assist the Director in securing active
15 industry, and State and local government, par-
16 ticipation in the program;

17 (B) recommend to the Director innovative
18 approaches to achieving the purpose stated in
19 subsection (b)(1); and

20 (C) advise the Director regarding program
21 metrics, implementation and performance of the
22 program, and program progress reports.

23 (2) DURATION.—Section 14 of the Federal Ad-
24 visory Committee Act shall not apply to the advisory
25 committee established under this subsection.

1 (h) AUTHORIZATION OF APPROPRIATIONS.—There
2 are authorized to be appropriated to the National Science
3 Foundation to carry out this section—

4 (1) \$25,000,000 for fiscal year 2003; and

5 (2) such sums as may be necessary thereafter.

6 (i) RELATED PROGRAMS.—The Director shall give
7 consideration to achieving the purpose stated in subsection
8 (b)(1) by awarding grants to institutions participating in
9 the Louis Stokes Alliances for Minority Participation.

10 **SEC. 5. INSTITUTIONAL REFORM.**

11 (a) IN GENERAL.—The Director shall award grants,
12 on a merit-reviewed, competitive basis, to institutions of
13 higher education to expand previously implemented re-
14 forms of undergraduate science, mathematics, engineer-
15 ing, or technology education that have been demonstrated
16 to have been successful in increasing the number and qual-
17 ity of students studying and receiving associate or bacca-
18 laurate degrees in science, mathematics, engineering, or
19 technology.

20 (b) USES OF FUNDS.—Activities supported by grants
21 under this section may include—

22 (1) expansion of successful reform efforts be-
23 yond a single course or group of courses to achieve
24 reform within an entire academic unit;

1 (2) expansion of successful reform efforts be-
2 yond a single academic unit to other science, mathe-
3 matics, engineering, or technology academic units
4 within an institution;

5 (3) creation of multidisciplinary courses or pro-
6 grams that formalize collaborations for the purpose
7 of improved student instruction and research in
8 science, mathematics, engineering, and technology;

9 (4) expansion of undergraduate research oppor-
10 tunities beyond a particular laboratory, course, or
11 academic unit to engage multiple academic units in
12 providing multidisciplinary research opportunities
13 for undergraduate students;

14 (5) expansion of innovative tutoring or men-
15 toring programs proven to enhance student recruit-
16 ment or persistence to degree completion in science,
17 mathematics, engineering, or technology;

18 (6) improvement of undergraduate science,
19 mathematics, engineering, and technology education
20 for nonmajors, including teacher education majors;
21 and

22 (7) implementation of technology-driven reform
23 efforts, including the installation of technology to fa-
24 cilitate such reform, that directly impact under-

1 graduate science, mathematics, engineering, or tech-
2 nology instruction or research experiences.

3 (c) SELECTION PROCESS.—

4 (1) APPLICATIONS.—An institution of higher
5 education seeking a grant under this section shall
6 submit an application to the Director at such time,
7 in such manner, and containing such information as
8 the Director may require. The application shall in-
9 clude, at a minimum—

10 (A) a description of the proposed reform
11 effort;

12 (B) a description of the previously imple-
13 mented reform effort that will serve as the basis
14 for the proposed reform effort and evidence of
15 success of that previous effort, including data
16 on student recruitment, persistence to degree
17 completion, and academic achievement;

18 (C) evidence of active participation in the
19 proposed project by individuals who were cen-
20 tral to the success of the previously imple-
21 mented reform effort; and

22 (D) evidence of institutional support for,
23 and commitment to, the proposed reform effort,
24 including a description of existing or planned
25 institutional policies and practices regarding

1 faculty hiring, promotion, tenure, and teaching
2 assignment that reward faculty contributions to
3 undergraduate education equal to, or greater
4 than, scholarly scientific research.

5 (2) REVIEW OF APPLICATIONS.—In evaluating
6 applications submitted under paragraph (1), the Di-
7 rector shall consider at a minimum—

8 (A) the evidence of past success in imple-
9 menting undergraduate education reform and
10 the likelihood of success in undertaking the pro-
11 posed expanded effort;

12 (B) the extent to which the faculty, staff,
13 and administrators are committed to making
14 the proposed institutional reform a priority of
15 the participating academic unit;

16 (C) the degree to which the proposed re-
17 form will contribute to change in institutional
18 culture and policy such that a greater value is
19 placed on faculty engagement in undergraduate
20 education and that a commensurate reward
21 structure is implemented to recognize faculty
22 for their scholarly work in this area; and

23 (D) the likelihood that the institution will
24 sustain or expand the reform beyond the period
25 of the grant.

1 (3) GRANT DISTRIBUTION.—The Director shall
2 ensure, to the extent practicable, that grants award-
3 ed under this section are made to a variety of types
4 of institutions of higher education.

5 (d) AUTHORIZATION OF APPROPRIATIONS.—There
6 are authorized to be appropriated to the National Science
7 Foundation to carry out this section \$15,000,000 for each
8 of fiscal years 2003 through 2007.

9 **SEC. 6. FACULTY DEVELOPMENT.**

10 (a) IN GENERAL.—The Director shall award grants,
11 on a merit-reviewed, competitive basis, to—

12 (1) institutions of higher education;

13 (2) eligible nonprofit organizations; or

14 (3) consortia of institutions and organizations
15 described in paragraphs (1) and (2),

16 for professional development of undergraduate faculty in
17 support of improved undergraduate science, mathematics,
18 engineering, and technology education.

19 (b) USES OF FUNDS.—Activities supported by grants
20 under this section may include—

21 (1) support for individuals to participate in
22 scholarly activities aimed at improving under-
23 graduate science, mathematics, engineering, and
24 technology education including—

1 (A) sabbatical funding, including partial or
2 full support for salary, benefits, and supplies,
3 for faculty participating in scholarly research
4 in—

5 (i) science, mathematics, engineering,
6 or technology;

7 (ii) the science of learning; or

8 (iii) assessment and evaluation related
9 to undergraduate instruction and student
10 academic achievement;

11 (B) stipend support for graduate students
12 and post-doctoral fellows to participate in in-
13 structional or evaluative activities at primarily
14 undergraduate institutions; and

15 (C) release time from teaching for faculty
16 engaged in the development, implementation,
17 and assessment of undergraduate science,
18 mathematics, engineering, and technology edu-
19 cation reform activities following participation
20 in a sabbatical opportunity or faculty develop-
21 ment program described in this subsection; and

22 (2) support for institutions to develop, imple-
23 ment, and assess faculty development programs fo-
24 cused on improved instruction, mentoring, evalua-
25 tion, and support of undergraduate science, mathe-

1 matics, engineering, and technology students, includ-
2 ing costs associated with—

3 (A) stipend support or release time for fac-
4 ulty and staff engaged in the development, de-
5 livery, and assessment of the faculty develop-
6 ment program;

7 (B) stipend support or release time for fac-
8 ulty, graduate students, or post-doctoral fellows
9 from the host institution or external institutions
10 who are engaged as participants in such faculty
11 development programs; and

12 (C) support for materials, supplies, travel
13 expenses, and consulting fees associated with
14 the development, delivery, and assessment of
15 such faculty development programs.

16 (c) APPLICATIONS.—An entity seeking a grant under
17 this section shall submit an application to the Director at
18 such time, in such manner, and containing such informa-
19 tion as the Director may require. The application shall in-
20 clude, at a minimum—

21 (1) a description of the activities to be carried
22 out under the proposed project and the projected im-
23 pact of the project on undergraduate majors and
24 nonmajors enrolled in science, mathematics, engi-
25 neering, or technology courses or programs;

1 (2) a plan for assessment of the outcomes of
2 the proposed project;

3 (3) a plan for dissemination of information re-
4 garding the activities and outcomes of the proposed
5 project; and

6 (4) evidence of institutional support for imple-
7 mentation of the proposed project, including commit-
8 ment to appropriate faculty sabbaticals and release
9 time from teaching.

10 (d) ANNUAL MEETING.—The Director shall convene
11 an annual meeting of awardees under this section to foster
12 greater national information dissemination and collabora-
13 tion in the area of undergraduate science, mathematics,
14 engineering, and technology education.

15 (e) AUTHORIZATION OF APPROPRIATIONS.—There
16 are to be authorized to be appropriated to the National
17 Science Foundation to carry out this section \$8,000,000
18 for each of fiscal years 2003 through 2007.

19 **SEC. 7. ACCESS TO RESEARCH-GRADE INSTRUMENTATION.**

20 (a) IN GENERAL.—The Director shall award grants,
21 on a merit-reviewed, competitive basis, to institutions of
22 higher education to support the acquisition of research-
23 grade instrumentation and to support training related to
24 the use of that instrumentation. Instruments provided
25 through awards under this section shall be used primarily

1 for undergraduate research, undergraduate instruction, or
2 both, in science, mathematics, engineering, or technology.

3 (b) ELIGIBLE INSTITUTIONS.—Grants may be
4 awarded under this section only to institutions of higher
5 education that award fewer than 10 doctoral degrees per
6 year in disciplines for which the National Science Founda-
7 tion provides research support.

8 (c) AUTHORIZATION OF APPROPRIATIONS.—There
9 are to be authorized to be appropriated to the National
10 Science Foundation to carry out this section \$10,000,000
11 for each of fiscal years 2003 through 2007.

12 **SEC. 8. UNDERGRADUATE RESEARCH EXPERIENCES.**

13 (a) IN GENERAL.—The Director shall award grants,
14 on a merit-reviewed, competitive basis, to institutions of
15 higher education, eligible nonprofit organizations, or con-
16 sortia thereof to establish sites that provide research expe-
17 riences for 10 or more undergraduate science, mathe-
18 matics, engineering, or technology students. The Director
19 shall ensure that—

20 (1) at least half of the students participating at
21 each site funded under this section shall be recruited
22 from institutions of higher education where research
23 activities in science, mathematics, engineering, or
24 technology are limited or nonexistent;

1 (2) the awards provide undergraduate research
2 experiences in a wide range of science, mathematics,
3 engineering, or technology disciplines;

4 (3) awards support a variety of projects includ-
5 ing independent investigator-led projects, multidisci-
6 plinary projects, and multiinstitutional projects (in-
7 cluding virtual projects);

8 (4) students participating in the projects have
9 mentors, including during the academic year, to help
10 connect the students' research experiences to the
11 overall academic course of study and to help stu-
12 dents achieve success in courses of study leading to
13 a baccalaureate degree in science, mathematics, en-
14 gineering, or technology;

15 (5) mentors and students are supported with
16 appropriate summer salary or stipends; and

17 (6) all student participants are tracked through
18 receipt of the undergraduate degree and for at least
19 1 year thereafter.

20 (b) AUTHORIZATION OF APPROPRIATIONS.—There
21 are authorized to be appropriated to the National Science
22 Foundation to carry out this section \$10,000,000 for each
23 of fiscal years 2003 through 2007.

1 **SEC. 9. DISSEMINATION OF PROJECT INFORMATION.**

2 The Director shall ensure that all National Science
3 Foundation-sponsored undergraduate science, mathe-
4 matics, engineering, or technology education projects, in-
5 cluding those sponsored by National Science Foundation
6 research directorates, shall disseminate via the Internet,
7 at a minimum, the following information:

8 (1) Scope, goals, and objectives of each project.

9 (2) Activities, methodologies, and practices de-
10 veloped and implemented.

11 (3) Outcomes, both positive and negative, of
12 project assessment activities.

13 **SEC. 10. EVALUATION.**

14 (a) IN GENERAL.—The Director, through the Re-
15 search, Evaluation and Communication Division of the
16 Education and Human Resources Directorate of the Na-
17 tional Science Foundation, shall evaluate the effectiveness
18 of all undergraduate science, mathematics, engineering, or
19 technology education activities supported by the National
20 Science Foundation in increasing the number and quality
21 of students, including students from groups underrep-
22 resented in science, mathematics, engineering, and tech-
23 nology fields, studying and receiving associate or bacca-
24 laureate degrees in science, mathematics, engineering, and
25 technology. In conducting the evaluation, the Director
26 shall consider information on—

1 (1) the number of students enrolled;

2 (2) student academic achievement, including
3 quantifiable measurements of students' mastery of
4 content and skills;

5 (3) persistence to degree completion, including
6 students who transfer from science, mathematics,
7 engineering, and technology programs to programs
8 in other academic disciplines; and

9 (4) placement during the first year after degree
10 completion in post-graduate education or career
11 pathways.

12 (b) ASSESSMENT BENCHMARKS AND TOOLS.—The
13 Director, through the Research, Evaluation and Commu-
14 nication Division of the Education and Human Resources
15 Directorate of the National Science Foundation, shall es-
16 tablish a common set of assessment benchmarks and tools,
17 and shall enable every National Science Foundation-spon-
18 sored project to incorporate the use of these benchmarks
19 and tools in their project-based assessment activities.

20 (c) DISSEMINATION OF EVALUATION RESULTS.—
21 The results of the evaluations required under subsection
22 (a) shall be made available to the public.

23 (d) REPORTS TO CONGRESS.—Not later than 3 years
24 after the date of the enactment of this Act, and once every
25 3 years thereafter, the Director shall transmit to the Con-

1 gress a report containing the results of evaluations under
2 subsection (a).

3 **SEC. 11. NATIONAL ACADEMY OF SCIENCES STUDY ON UN-**
4 **DERGRADUATE RECRUITMENT AND RETEN-**
5 **TION.**

6 (a) STUDY.—Not later than 3 months after the date
7 of the enactment of this Act, the Director shall enter into
8 an arrangement with the National Research Council of the
9 National Academy of Sciences to perform a study on the
10 factors that influence undergraduate students to enter and
11 persist to degree completion in science, mathematics, engi-
12 neering, and technology programs or to leave such pro-
13 grams and matriculate to other academic programs, as re-
14 ported by students.

15 (b) TRANSMITTAL TO CONGRESS.—Not later than 18
16 months after the date of the enactment of this Act, the
17 Director shall transmit to the Congress a report con-
18 taining the results of the study under subsection (a).

19 (c) AUTHORIZATION OF APPROPRIATION.—There are
20 authorized to be appropriated to the National Science
21 Foundation for carrying out this section \$700,000 for fis-
22 cal year 2003, to remain available until expended.

23 **SEC. 12. MINORITY-SERVING INSTITUTIONS UNDER-**
24 **GRADUATE PROGRAM.**

25 (a) IN GENERAL.—

1 (1) The Director shall establish a program to
2 award grants to Hispanic-Serving Institutions, His-
3 torically Black Colleges and Universities, Alaska Na-
4 tive-Serving Institutions, Native Hawaiian-Serving
5 Institutions, and tribally controlled colleges and uni-
6 versities to enhance the quality of undergraduate
7 science, mathematics, and engineering education at
8 such institutions and to increase the retention and
9 graduation rates of students pursuing baccalaureate
10 degrees in science, mathematics, or engineering.

11 (2) Grants shall be awarded under this section
12 on a merit-reviewed, competitive basis.

13 (b) PROGRAM COMPONENTS.—Grants awarded under
14 this section shall support—

15 (1) activities to improve courses and curriculum
16 in science, mathematics, or engineering disciplines;

17 (2) faculty development, including support
18 for—

19 (A) sabbaticals and exchange programs to
20 improve the faculty's research competency and
21 knowledge of technological advances;

22 (B) professional development workshops on
23 innovative teaching practices and assessment;

24 (C) visiting faculty, including researchers
25 from industry; and

1 (D) faculty reassigned time or release time
2 to mentor students or to participate in cur-
3 riculum reform and academic enhancement ac-
4 tivities;

5 (3) stipends for undergraduate students partici-
6 pating in research activities in science, mathematics,
7 or engineering disciplines on-campus or off-campus
8 at industrial, governmental, or academic research
9 laboratories; and

10 (4) other activities that are consistent with sub-
11 section (a)(1), as determined by the Director.

12 (c) APPLICATION.—An institution seeking funding
13 under this section shall submit an application to the Direc-
14 tor at such time, in such manner, and containing such
15 information as the Director may require.

16 **SEC. 13. ADVANCED TECHNOLOGICAL EDUCATION PRO-**
17 **GRAM.**

18 (a) CORE SCIENCE AND MATHEMATICS COURSES.—
19 Section 3(a) of the Scientific and Advanced-Technology
20 Act of 1992 (42 U.S.C. 1862i(a)) is amended—

21 (1) by inserting “, and to improve the quality
22 of their core education courses in science and mathe-
23 matics” after “education in advanced-technology
24 fields”;

1 (2) in paragraph (1) by inserting “and in core
2 science and mathematics courses” after “advanced-
3 technology fields”; and

4 (3) in paragraph (2) by striking “in advanced-
5 technology fields” and inserting “who provide in-
6 struction in science, mathematics, and advanced-
7 technology fields”.

8 (b) ARTICULATION PARTNERSHIPS.—Section
9 3(c)(1)(B) of the Scientific and Advanced-Technology Act
10 of 1992 (42 U.S.C. 1862i(c)(1)(B)) is amended—

11 (1) by striking “and” at the end of clause (i);

12 (2) by striking the period at the end of clause
13 (ii) and inserting a semicolon; and

14 (3) by adding after clause (ii) the following new
15 clauses:

16 “(iii) provide students with research expe-
17 riences at bachelor-degree-granting institutions
18 participating in the partnership, including sti-
19 pend support for students participating in sum-
20 mer programs; and

21 “(iv) provide faculty mentors for students
22 participating in activities under clause (iii), in-
23 cluding summer salary support for faculty men-
24 tors.”.

1 (c) ADVANCED TECHNOLOGICAL EDUCATION ADVI-
2 SORY COMMITTEE.—

3 (1) ESTABLISHMENT.—The Director shall es-
4 tablish an advisory committee on science, mathe-
5 matics, and technology education at community col-
6 leges consisting of non-Federal members, including
7 representatives from academia and industry. The ad-
8 visory committee shall review, and provide the Direc-
9 tor with an assessment of, activities carried out
10 under the Advanced Technological Education Pro-
11 gram (in this section referred to as the “Program”),
12 including—

13 (A) conformity of the Program to the re-
14 quirements of the Scientific and Advanced-
15 Technology Act of 1992;

16 (B) the effectiveness of activities supported
17 under the Program in strengthening the sci-
18 entific and technical education and training ca-
19 pabilities of community colleges;

20 (C) the effectiveness of the National
21 Science Foundation and institutions receiving
22 awards under the Program in disseminating in-
23 formation to other community colleges about
24 activities carried out under the Program and

1 about model curricula and teaching methods de-
2 veloped under the Program;

3 (D) the balance of resources allocated
4 under the Program for support of national cen-
5 ters of excellence, individual institution grants,
6 and articulation partnerships; and

7 (E) other issues identified by the Director.

8 The advisory committee shall make recommenda-
9 tions to the Director for improvements to the Pro-
10 gram based on its reviews and assessments.

11 (2) ADVISORY COMMITTEE REPORTS.—The ad-
12 visory committee established under paragraph (1)
13 shall report annually to the Director and to Con-
14 gress on the findings and recommendations resulting
15 from the reviews and assessments conducted in ac-
16 cordance with paragraph (1).

17 (3) DURATION.—Section 14 of the Federal Ad-
18 visory Committee Act shall not apply to the advisory
19 committee established under this subsection.

20 (d) NATIONAL SCIENCE FOUNDATION REPORT.—

21 Within 6 months after the date of the enactment of this
22 Act, the Director shall transmit a report to Congress on—

23 (1) efforts by the National Science Foundation
24 and awardees under the Program to disseminate in-
25 formation about the results of projects;

1 (2) the effectiveness of national centers of sci-
2 entific and technical education established under sec-
3 tion 3(b) of the Scientific and Advanced-Technology
4 Act of 1992 in serving as national and regional
5 clearinghouses of information and models for best
6 practices in undergraduate science, mathematics,
7 and technology education; and

8 (3) efforts to satisfy the requirement of section
9 3(f)(4) of the Scientific and Advanced-Technology
10 Act of 1992.

11 (e) AUTHORIZATION OF APPROPRIATIONS.—There
12 are authorized to be appropriated to the National Science
13 Foundation—

14 (1) for activities to improve core science and
15 mathematics education in accordance with section
16 3(a) of the Scientific and Advanced-Technology Act
17 of 1992 (42 U.S.C. 1862i(a)), as amended by sub-
18 section (a) of this section, \$5,000,000 for each of
19 fiscal years 2003 through 2007;

20 (2) for acquisition of instrumentation in accord-
21 ance with section 3(a)(4) of the Scientific and Ad-
22 vanced-Technology Act of 1992—

23 (A) \$3,000,000 for fiscal year 2003;

24 (B) \$3,500,000 for fiscal year 2004;

25 (C) \$4,000,000 for fiscal year 2005;

1 (D) \$4,500,000 for fiscal year 2006; and
2 (E) \$5,000,000 for fiscal year 2007; and
3 (3) for support for research experiences for un-
4 dergraduate students in accordance with section
5 3(c)(1)(B) of the Scientific and Advanced-Tech-
6 nology Act of 1992 (42 U.S.C. 1862i(c)(1)(B)), as
7 amended by subsection (b) of this section, \$750,000
8 for each of fiscal years 2003 through 2007.

Passed the House of Representatives July 9, 2002.

Attest:

JEFF TRANDAHL

Clerk.

By MARTHA C. MORRISON,

Deputy Clerk.