

107TH CONGRESS  
1ST SESSION

# S. 478

To establish and expand programs relating to engineering, science, technology,  
and mathematics education, and for other purposes.

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## IN THE SENATE OF THE UNITED STATES

MARCH 7, 2001

Mr. ROBERTS (for himself, Mr. KENNEDY, and Mr. BINGAMAN) introduced  
the following bill; which was read twice and referred to the Committee  
on Health, Education, Labor, and Pensions

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## A BILL

To establish and expand programs relating to engineering,  
science, technology, and mathematics education, and for  
other purposes.

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

3       **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

4       (a) SHORT TITLE.—This Act may be cited as the  
5       “Engineering, Science, Technology, and Mathematics  
6       Education Enhancement Act” or the “ESTM Act”.

7       (b) TABLE OF CONTENTS.—The table of contents for  
8       this Act is as follows:

Sec. 1. Short title; table of contents.

Sec. 2. Findings.

Sec. 3. Assurance of continued local control.

#### TITLE I—NATIONAL SCIENCE EDUCATION ENHANCEMENT

Sec. 101. Short title.

Sec. 102. Support for mentoring activities for engineering, science, technology and mathematics teachers.

Sec. 103. Expansion of Eisenhower National Clearinghouse.

Sec. 104. Summer Professional Development Institutes.

Sec. 105. Grants for teacher technology training software and instructional materials.

Sec. 106. Reservation for after-school activities.

Sec. 107. After-school science day care at community learning centers.

#### TITLE II—PROVISIONS RELATING TO THE NATIONAL SCIENCE FOUNDATION

Sec. 201. Master teacher grant program.

Sec. 202. Dissemination of information on required course of study for careers in engineering, science, technology and mathematics education.

Sec. 203. Requirement to conduct study evaluation.

Sec. 204. Teacher technology professional development.

Sec. 205. Engineering, science, technology and mathematics business education conference.

Sec. 206. Grants for distance learning.

Sec. 207. Scholarships to participate in certain research activities.

Sec. 208. Interagency coordination of science education programs.

Sec. 209. Definitions.

#### TITLE III—OTHER PROVISIONS

Sec. 301. Work-study amendments.

Sec. 302. Study.

Sec. 303. Report to congress.

### 1 **SEC. 2. FINDINGS.**

2 Congress finds the following:

3 (1) As concluded in the report of the Com-  
 4 mittee on Science of the House of Representatives,  
 5 “Unlocking Our Future Toward a New National  
 6 Science Policy,” which was adopted by the House of  
 7 Representatives, the United States must maintain  
 8 and improve its preeminent position in science and  
 9 technology in order to advance human under-

1 standing of the universe and all it contains, and to  
2 improve the lives, health, and freedoms of all people.

3 (2) It is estimated that more than half of the  
4 economic growth of the United States today results  
5 directly from research and development in science  
6 and technology. The most fundamental research is  
7 responsible for investigating our perceived universe,  
8 to extend our observations to the outer limits of  
9 what our minds and methods can achieve, and to  
10 seek answers to questions that have never been  
11 asked before. Applied research continues the process  
12 by applying the answers from basic science to the  
13 problems faced by individuals, organizations, and  
14 governments in the everyday activities that make our  
15 lives more livable. The scientific-technological sector  
16 of our economy, which has driven our recent eco-  
17 nomic boom and led the United States to the longest  
18 period of prosperity in history, is fueled by the work  
19 and discoveries of the scientific community.

20 (3) The effectiveness of the United States in  
21 maintaining this economic growth will be largely de-  
22 termined by the intellectual capital of the United  
23 States. Education is critical to developing this re-  
24 source.

1           (4) The education program of the United States  
2       needs to provide for 3 different kinds of intellectual  
3       capital. First, it needs scientists and engineers to  
4       continue the research and development that is cen-  
5       tral to the economic growth of the United States.  
6       Second, it needs technologically proficient workers  
7       who are comfortable and capable dealing with the  
8       demands of a science-based, high-technology work-  
9       place. Last, it needs scientifically literate voters and  
10      consumers to make intelligent decisions about public  
11      policy.

12           (5) Student performance on the recent Third  
13      International Math and Science Study highlights the  
14      shortcomings of current K–12 science and mathe-  
15      matics education in the United States, particularly  
16      when compared to other countries. We must expect  
17      more from our Nation’s educators and students if  
18      we are to build on the accomplishments of previous  
19      generations. New methods of teaching mathematics  
20      and science are required, as well as better curricula  
21      and improved training of teachers.

22           (6) Science is more than a collection of facts,  
23      theories, and results. It is a process of inquiry built  
24      upon observations and data that leads to a way of

1 knowing and explaining in logically derived concepts  
2 and theories.

3 (7) Students should learn science primarily by  
4 doing science. Science education ought to reflect the  
5 scientific process and be object-oriented, experiment-  
6 centered, and concept-based.

7 (8) Children are naturally curious and inquisi-  
8 tive. To successfully tap into these innate qualities,  
9 education in science must begin at an early age and  
10 continue throughout the entire school experience.

11 (9) Teachers provide the essential connection  
12 between students and the content they are learning.  
13 High-quality prospective teachers need to be identi-  
14 fied and recruited by presenting to them a career  
15 that is respected by their peers, is financially and in-  
16 tellectually rewarding, and contains sufficient oppor-  
17 tunities for advancement.

18 (10) Teachers need to have incentives to remain  
19 in the classroom and improve their practice, and  
20 training of teachers is essential if the results are to  
21 be good. Teachers need to be knowledgeable of their  
22 content area, of their curriculum, of up-to-date re-  
23 search in teaching and learning, and of techniques  
24 that can be used to connect that information to their  
25 students in their classroom.

1 **SEC. 3. ASSURANCE OF CONTINUED LOCAL CONTROL.**

2       Nothing in this Act may be construed to authorize  
 3 any department, agency, officer, or employee of the United  
 4 States to exercise any direction, supervision, or control  
 5 over the curriculum, program of instruction, administra-  
 6 tion, or personnel of any educational institution or school  
 7 system.

8       **TITLE I—NATIONAL SCIENCE**  
 9       **EDUCATION ENHANCEMENT**

10 **SEC. 101. SHORT TITLE.**

11       This title may be cited as the “National Science Edu-  
 12 cation Enhancement Act”.

13 **SEC. 102. SUPPORT FOR MENTORING ACTIVITIES FOR EN-**  
 14 **GINEERING, SCIENCE, TECHNOLOGY AND**  
 15 **MATHEMATICS TEACHERS.**

16       (a) IMPROVING BASIC PROGRAMS OPERATED BY  
 17 LOCAL EDUCATIONAL AGENCIES THROUGH PROFES-  
 18 SIONAL DEVELOPMENT.—Section 1119(b)(1) of the Ele-  
 19 mentary and Secondary Education Act of 1965 (20 U.S.C.  
 20 6301(b)(1)) is amended—

21           (1) by striking “and” at the end of subpara-  
 22 graph (D);

23           (2) by striking the period at the end of sub-  
 24 paragraph (E) and inserting “; and”; and

25           (3) by adding at the end the following:

1                   “(F) include mentoring programs focusing  
 2                   on changing engineering, science, technology  
 3                   and mathematics teacher behaviors and prac-  
 4                   tices to help novice teachers develop and gain  
 5                   confidence in their skills, to increase the likeli-  
 6                   hood that they will continue in the teaching  
 7                   profession, and generally to improve the quality  
 8                   of their teaching.”.

9           (b) DISSEMINATION OF MENTORING INFORMATION  
 10 BY EISENHOWER NATIONAL CLEARINGHOUSE.—Section  
 11 2102(a)(3)(C) of the Elementary and Secondary Edu-  
 12 cation Act of 1965 (20 U.S.C. 6622(a)(3)(C)) is amended  
 13 by striking “materials” and inserting “materials, includ-  
 14 ing information on model engineering, science, technology  
 15 and mathematics teacher mentoring programs,”.

16           (c) EISENHOWER PROFESSIONAL DEVELOPMENT  
 17 PROGRAM STATE APPLICATIONS.—Section 2205(b)(2) of  
 18 the Elementary and Secondary Education Act of 1965 (20  
 19 U.S.C. 6645(b)(2)) is amended—

20                   (1) by striking “and” at the end of subpara-  
 21                   graph (N);

22                   (2) by striking the period at the end of sub-  
 23                   paragraph (O) and inserting “; and”; and

24                   (3) by adding at the end the following:

1           “(P) describe how the State will administer  
 2           a mentoring system to ensure consistent imple-  
 3           mentation of mentoring programs for engineer-  
 4           ing, science, technology and mathematics teach-  
 5           ers, provide a structure for local mentoring pro-  
 6           gram evaluation, provide technical assistance to  
 7           local mentoring programs, ensure compliance by  
 8           local mentoring programs with State teacher  
 9           training requirements, and provide incentives  
 10          for local educational agencies to take mentoring  
 11          into consideration in assessing instructional  
 12          staff hiring needs.”.

13          (d) EISENHOWER PROFESSIONAL DEVELOPMENT  
 14          PROGRAM LOCAL ACTIVITIES.—Section 2210(b)(2) of the  
 15          Elementary and Secondary Education Act of 1965 (20  
 16          U.S.C. 6650(b)(2)) is amended—

17               (1) by striking “and” at the end of subpara-  
 18          graph (D);

19               (2) by striking the period at the end of sub-  
 20          paragraph (E) and inserting “; and”; and

21               (3) by adding at the end the following:

22                       “(F) include mentoring programs focusing  
 23                       on changing engineering, science, technology  
 24                       and mathematics teacher behaviors and prac-  
 25                       tices to help novice teachers develop and gain



1 confidence in their skills, to increase the likeli-  
 2 hood that they will continue in the teaching  
 3 profession, and generally to improve the quality  
 4 of their teaching.”.

5 (e) ACCOUNTABILITY.—Section 2401(a) of the Ele-  
 6 mentary and Secondary Education Act of 1965 (20 U.S.C.  
 7 6701(a)) is amended by striking “part.” and inserting  
 8 “part, including the impact of State and local mentoring  
 9 programs on teaching quality and teacher retention  
 10 rates.”.

11 **SEC. 103. EXPANSION OF EISENHOWER NATIONAL CLEAR-**  
 12 **INGHOUSE.**

13 (a) ALLOCATION OF APPROPRIATED AMOUNTS.—  
 14 Section 2003(b)(1) of the Elementary and Secondary  
 15 Education Act of 1965 (20 U.S.C. 6603(b)(1)) is amended  
 16 by striking “2103;” and inserting “2103, and  
 17 \$10,000,000 shall be available to carry out subparagraphs  
 18 (A), (F), and (G) of section 2102(b)(3);”.

19 (b) USE OF FUNDS.—Section 2102(b)(3) of the Ele-  
 20 mentary and Secondary Education Act of 1965 (20 U.S.C.  
 21 6622(b)(3)) is amended—

22 (1) in subparagraph (A), by striking “(includ-  
 23 ing, to the extent practicable,” and inserting “(in-  
 24 cluding”;

1           (2) in subparagraph (E), by striking “and” at  
2     the end;

3           (3) by amending subparagraph (F) to read as  
4     follows:

5           “(F) solicit and gather (in consultation  
6     with the Department, national teacher associa-  
7     tions, professional associations, and other re-  
8     viewers and developers of educational materials  
9     and programs) all qualitative and evaluative  
10    materials and all programs, including full text  
11    and graphics, for the Clearinghouse, review the  
12    evaluation of the materials and programs, rank  
13    the effectiveness of the materials and programs  
14    on the basis of the evaluations, and distribute  
15    the results of the reviews (in a short, standard-  
16    ized, and electronic format that contains elec-  
17    tronic links to an electronic version of the origi-  
18    nal qualitative and evaluative materials), ex-  
19    cerpts of the materials and links to Internet-  
20    based sites, and information regarding on-line  
21    communities of users to teachers in an easily  
22    accessible manner, except that nothing in this  
23    subparagraph shall be construed to permit the  
24    Clearinghouse to directly conduct an evaluation  
25    of the materials or programs; and”;

1 (4) by adding at the end the following:

2 “(G) develop and establish an Internet-  
3 based site offering a search mechanism to assist  
4 site visitors in identifying information available  
5 through the Clearinghouse on engineering,  
6 science, technology and mathematics education  
7 instructional materials and programs, including  
8 electronic links to information on classroom  
9 demonstrations and experiments, teachers who  
10 have used materials or participated in pro-  
11 grams, vendors, curricula, and textbooks.”.

12 (c) CLEARINGHOUSE.—Section 2102(b) of the Ele-  
13 mentary and Secondary Education Act of 1965 (20 U.S.C.  
14 6622(b)) is amended by adding at the end the following:

15 “(9) EFFECTIVE USE OF TECHNOLOGY.—In re-  
16 viewing evaluations of materials and programs under  
17 this subsection the Clearinghouse shall give par-  
18 ticular attention to the effective use of materials and  
19 technology in engineering, science, technology and  
20 mathematics education.”.

21 (d) REPORT.—Not later than two years after the date  
22 of the enactment of this Act, the National Academy of  
23 Sciences, in conjunction with appropriate related associa-  
24 tions and organizations, shall—

1           (1) conduct a study on the Eisenhower National  
 2       Clearinghouse and whether the provisions enacted in  
 3       the amendments made by this section have resulted  
 4       in the Clearinghouse becoming a more effective enti-  
 5       ty; and

6           (2) submit to Congress a report on the study,  
 7       including any recommendations of the Academy re-  
 8       garding the Clearinghouse.

9   **SEC. 104. SUMMER PROFESSIONAL DEVELOPMENT INSTI-**  
 10                   **TUTES.**

11       (a) IN GENERAL.—Section 2211 of the Elementary  
 12   and Secondary Education Act of 1965 (20 U.S.C. 6651)  
 13   is amended by adding at the end the following:

14       “(d) SUMMER PROFESSIONAL DEVELOPMENT INSTI-  
 15   TUTES FOR TEACHERS.—

16           “(1) PROGRAM AUTHORIZED.—From amounts  
 17       made available to carry out this subsection, the Sec-  
 18       retary is authorized to make grants to State agen-  
 19       cies for higher education, working in conjunction  
 20       with the State educational agency (if such agencies  
 21       are separate), for activities described in paragraph  
 22       (3). Such grants shall be awarded on a competitive  
 23       basis that includes a peer review of the grant appli-  
 24       cations.

1           “(2) SUBGRANTS.—A recipient of a grant  
 2           under paragraph (1) shall carry out the activities de-  
 3           scribed in paragraph (3) by making subgrants to, or  
 4           entering into contracts or cooperative agreements  
 5           with, institutions of higher education, and nonprofit  
 6           organizations of demonstrated effectiveness, includ-  
 7           ing museums and educational partnership organiza-  
 8           tions, which must work in conjunction with a local  
 9           educational agency, consortium of local educational  
 10          agencies, or schools.

11           “(3) ALLOWABLE ACTIVITIES.—

12           “(A) IN GENERAL.—Each recipient of  
 13           funds under paragraph (2) shall use the funds  
 14           for the following:

15           “(i) The establishment and operation  
 16           of engineering, science, technology and  
 17           mathematics summer institutes that pro-  
 18           vide professional development to elemen-  
 19           tary and secondary school teachers. Such  
 20           institutes shall be content-based, build on  
 21           school year curricula, and focus only sec-  
 22           ondarily on pedagogy.

23           “(ii) To provide teachers with travel  
 24           expense reimbursement, a stipend, or class-

1 room materials related to such an insti-  
 2 tute.

3 “(iii) The establishment of a mecha-  
 4 nism to provide supplemental assistance  
 5 and follow up training during the school  
 6 year for summer institute graduates.

7 “(B) REQUIREMENTS FOR CURRICULA.—  
 8 The curricula referred to in subparagraph  
 9 (A)(i) shall be object-centered, experiment-ori-  
 10 ented, content-based, and grounded in current  
 11 research.

12 “(C) REQUIREMENTS FOR INSTITUTES.—  
 13 The summer institutes referred to in subpara-  
 14 graph (A)(i)—

15 “(i) shall be conducted during a pe-  
 16 riod of a minimum of two weeks;

17 “(ii) shall provide for direct inter-  
 18 action between students and faculty;

19 “(iii) shall have a component that in-  
 20 cludes use of the Internet; and

21 “(iv) shall provide for follow-up train-  
 22 ing in the classroom during the academic  
 23 year for a period of a minimum of three  
 24 days, which shall not be required to be  
 25 consecutive, except that—

1 “(I) if the program at the sum-  
 2 mer institute is for a period of only  
 3 two weeks, the follow-up training shall  
 4 be for a period of more than 3 days;  
 5 and

6 “(II) for teachers in rural school  
 7 districts, follow-up training through  
 8 the Internet may be used.

9 “(4) REVIEW OF APPLICATIONS BY NATIONAL  
 10 SCIENCE FOUNDATION.—The Secretary shall provide  
 11 each application for a grant under this subsection to  
 12 the Director of the National Science Foundation in  
 13 order that such applications may undergo the peer-  
 14 review process described in paragraph (5)(B), and  
 15 shall implement the recommendations of the Direc-  
 16 tor in awarding grants under this subsection.

17 “(5) REQUIREMENTS ON NATIONAL SCIENCE  
 18 FOUNDATION.—

19 “(A) IN GENERAL.—Each year, not later  
 20 than 6 months before the application deadline  
 21 for a subgrant, contract, or cooperative agree-  
 22 ment described in paragraph (2), the Director  
 23 of the National Science Foundation shall de-  
 24 velop a structure for the summer institutes sup-  
 25 ported under this subsection. Such applications

1 shall address how funds will be used in accord-  
 2 ance with the structure developed by the Direc-  
 3 tor.

4 “(B) APPLICATION PEER-REVIEW PROC-  
 5 ESS.—The Director—

6 “(i) shall establish a peer-review proc-  
 7 ess for applications for grants received  
 8 under this subsection; and

9 “(ii) shall forward the applications se-  
 10 lected by the Director through such proc-  
 11 ess to the Secretary.

12 “(C) PRIORITY.—In making awards under  
 13 paragraph (2)(A), a grant recipient shall give  
 14 priority to applicants whose application includes  
 15 an assurance that the applicant will use a cur-  
 16 riculum that is three or four weeks in length.

17 “(6) OTHER REQUIREMENTS.—Paragraphs (2),  
 18 (3), and (4) of subsection (a), and subsection (c),  
 19 shall apply to recipients of funds under this sub-  
 20 section in the same manner as such provisions apply  
 21 to recipients of funds under subsection (a)(1).

22 “(7) CREDIT FOR PARTICIPATION.—Participa-  
 23 tion in an institute supported under this subsection  
 24 shall earn credit toward—



1           “(A) State continuing education require-  
2           ments for teachers; or

3           “(B) a post-baccalaureate degree program  
4           at an institution of higher education.”.

5       (b) FUNDING.—

6           (1)       ALLOCATION       OF       APPROPRIATED  
7       AMOUNTS.—Section 2003(b)(2) of the Elementary  
8       and Secondary Education Act of 1965 (20 U.S.C.  
9       6603(b)(2)) is amended by striking “B;” and insert-  
10      ing “B, of which \$100,000,000, \$150,000,000,  
11      \$200,000,000, and \$200,000,000 shall be available  
12      to carry out section 2211(d) for fiscal years 2002,  
13      2003, 2004, and 2005, respectively;”.

14          (2) RESERVATION OF FUNDS.—Section 2202(a)  
15      of the Elementary and Secondary Education Act of  
16      1965 (20 U.S.C. 6642(a)) is amended—

17               (A) in paragraph (1), by striking “and”;

18               (B) in paragraph (2), by striking the pe-  
19      riod at the end and inserting “; and”; and

20               (C) by adding at the end the following:

21               “(3) the amount made available under section  
22      2003(b)(2) to carry out section 2211(d).”.

1 **SEC. 105. GRANTS FOR TEACHER TECHNOLOGY TRAINING**  
 2 **SOFTWARE AND INSTRUCTIONAL MATERIALS.**

3 Section 3134 of the Elementary and Secondary Edu-  
 4 cation Act of 1965 (20 U.S.C. 6844) is amended—

5 (1) in paragraph (5), by striking “and” at the  
 6 end;

7 (2) in paragraph (6), by striking the period at  
 8 the end and inserting “; and”; and

9 (3) by adding at the end the following:

10 “(7) providing technology training software and  
 11 instructional materials to teachers.”.

12 **SEC. 106. RESERVATION FOR AFTER-SCHOOL ACTIVITIES.**

13 Section 10904(a) of the Elementary and Secondary  
 14 Education Act of 1965 (20 U.S.C. 8244) is amended—

15 (1) by striking “and” after the semicolon in  
 16 paragraph (2);

17 (2) by striking the period at the end of para-  
 18 graph (3) and inserting “; and”; and

19 (3) by adding at the end the following:

20 “(4) an assurance that if awarded a grant  
 21 under this part, the grant recipient shall use not less  
 22 than 5 percent of the amount received to provide  
 23 after-school day care services that focus on science  
 24 activities.”.

1 **SEC. 107. AFTER-SCHOOL SCIENCE DAY CARE AT COMMU-**  
2 **NITY LEARNING CENTERS.**

3 Section 10905(3) of the Elementary and Secondary  
4 Education Act of 1965 (20 U.S.C. 8245(3)) is amended  
5 by striking “services.” and inserting “services, including  
6 after-school day care services that focus on science activi-  
7 ties for children in grades kindergarten through the sixth  
8 grade.”.

9 **TITLE II—PROVISIONS RELAT-**  
10 **ING TO THE NATIONAL**  
11 **SCIENCE FOUNDATION**

12 **SEC. 201. MASTER TEACHER GRANT PROGRAM.**

13 (a) PROGRAM AUTHORIZED.—The Director of the  
14 National Science Foundation shall conduct a grant pro-  
15 gram to make grants to a State or local educational agen-  
16 cy, an elementary or middle school, or a consortium of  
17 any combination of those entities, for the purpose of hiring  
18 a master teacher.

19 (b) ELIGIBILITY.—In order to be eligible to receive  
20 a grant under this subsection, a State or local educational  
21 agency, elementary or middle school, or consortium de-  
22 scribed in subsection (a) shall submit to the Director a  
23 description of the relationship the master teacher will have  
24 vis-a-vis other administrative and managerial staff and the  
25 State and local educational agency, the ratio of master  
26 teachers to other teachers, and the requirements for a

1 master teacher of the State or local educational agency  
 2 or school, including certification requirements and job re-  
 3 sponsibilities of the master teacher. The description of job  
 4 responsibilities must include a discussion of any responsi-  
 5 bility the master teacher will have for—

6 (1) development or implementation of engineer-  
 7 ing, science, technology or mathematics curricula;

8 (2) in-classroom assistance;

9 (3) authority over hands-on inquiry materials,  
 10 equipment, and supplies;

11 (4) mentoring other teachers or fulfilling any  
 12 leadership role; and

13 (5) professional development, including training  
 14 other master teachers or other teachers, or devel-  
 15 oping or implementing professional development pro-  
 16 grams.

17 (c) ASSESSMENT OF EFFECTIVENESS.—The Director  
 18 shall assess the effectiveness of activities carried out under  
 19 this section.

20 (d) FUNDS.—

21 (1) SOURCE.—Grants shall be made under this  
 22 section out of funds available for the National  
 23 Science Foundation for education and human re-  
 24 sources activities.

1           (2) AUTHORIZATION.—There are authorized to  
 2           be appropriated to the National Science Foundation  
 3           to carry out this section \$50,000,000 for each of fis-  
 4           cal years 2002 through 2004.

5 **SEC. 202. DISSEMINATION OF INFORMATION ON REQUIRED**  
 6                   **COURSE OF STUDY FOR CAREERS IN ENGI-**  
 7                   **NEERING, SCIENCE, TECHNOLOGY AND**  
 8                   **MATHEMATICS EDUCATION.**

9           (a) IN GENERAL.—The Director of the National  
 10          Science Foundation shall, jointly with the Secretary of  
 11          Education, compile and disseminate information (includ-  
 12          ing through outreach, school counselor education, and vis-  
 13          iting speakers) regarding—

14               (1) typical standard prerequisites for middle  
 15          school and high school students who seek to enter a  
 16          course of study at an institution of higher education  
 17          in engineering, science, technology or mathematics  
 18          education for purposes of teaching in an elementary  
 19          or secondary school; and

20               (2) the licensing requirements in each State for  
 21          engineering, science, technology or mathematics ele-  
 22          mentary or secondary school teachers.

23          (b) AUTHORIZATION OF APPROPRIATIONS.—There  
 24          are authorized to be appropriated for the National Science

1 Foundation to carry out this section \$5,000,000 for each  
2 of fiscal years 2002 through 2004.

3 **SEC. 203. REQUIREMENT TO CONDUCT STUDY EVALUA-**  
4 **TION.**

5 (a) STUDY REQUIRED.—The Director of the National  
6 Science Foundation shall enter into an agreement with the  
7 National Academies of Sciences and Engineering under  
8 which the Academies shall review existing studies on the  
9 effectiveness of technology in the classroom on learning  
10 and student performance, using various measures of learn-  
11 ing and teaching outcome including standardized tests of  
12 student achievement, and explore the feasibility of one or  
13 more methodological frameworks to be used in evaluations  
14 of technologies that have different purposes and are used  
15 by schools and school systems with diverse educational  
16 goals. The study evaluation shall include, to the extent  
17 available, information on the type of technology used in  
18 each classroom, the reason that such technology works,  
19 and the teacher training that is conducted in conjunction  
20 with the technology.

21 (b) DEADLINE FOR COMPLETION.—The study eval-  
22 uation required by subsection (a) shall be completed not  
23 later than one year after the date of the enactment of this  
24 Act.

1 (c) DEFINITION OF TECHNOLOGY.—In this section,  
 2 the term “technology” has the meaning given that term  
 3 in section 3113(11) of the Elementary and Secondary  
 4 Education Act of 1965 (20 U.S.C. 6813(11)).

5 (d) AUTHORIZATION OF APPROPRIATIONS.—There  
 6 are authorized to be appropriated to the National Science  
 7 Foundation for the purpose of conducting the study eval-  
 8 uation required by subsection (a), \$600,000.

9 **SEC. 204. TEACHER TECHNOLOGY PROFESSIONAL DEVEL-**  
 10 **OPMENT.**

11 (a) IN GENERAL.—The Director of the National  
 12 Science Foundation shall establish a grant program under  
 13 which grants may be made to a State or local educational  
 14 agency, an elementary or middle school, or a consortium  
 15 consisting of any combination of those entities for instruc-  
 16 tion of teachers for grades kindergarten through the 12th  
 17 grade on the use of information technology in the class-  
 18 room. Grants awarded under this section shall be used for  
 19 training teachers to use—

20 (1) classroom technology, including hardware,  
 21 software, communications technologies, and labora-  
 22 tory equipment; or

23 (2) specific technology for engineering, science,  
 24 technology or mathematics instruction, including

1 data acquisition, modeling, visualization, simulation,  
2 and numerical analysis.

3 (b) AUTHORIZATION OF APPROPRIATIONS.—There  
4 are authorized to be appropriated for the National Science  
5 Foundation to carry out this section \$10,000,000 for each  
6 of fiscal years 2002 through 2004.

7 **SEC. 205. ENGINEERING, SCIENCE, TECHNOLOGY AND**  
8 **MATHEMATICS BUSINESS EDUCATION CON-**  
9 **ERENCE.**

10 (a) IN GENERAL.—Not later than 180 days after the  
11 date of the enactment of this Act, the Director of the Na-  
12 tional Science Foundation shall convene the first of an an-  
13 nual 3- to 5-day conference for kindergarten through the  
14 12th grade engineering, science, technology and mathe-  
15 matics education stakeholders, including—

16 (1) representatives from Federal, State, and  
17 local governments, private industries, private busi-  
18 nesses, and professional organizations;

19 (2) educators;

20 (3) engineering, science, technology and mathe-  
21 matics educational resource providers;

22 (4) students; and

23 (5) any other stakeholders the Director deter-  
24 mines would provide useful participation in the con-  
25 ference.



1 (b) PURPOSES.—The purposes of the conference con-  
2 vened under subsection (a) shall be to—

3 (1) identify and gather information on existing  
4 engineering, science, technology and mathematics  
5 education programs and resource providers, includ-  
6 ing information on distribution, partners, cost as-  
7 sessment, and derivation;

8 (2) determine the extent of any existing coordi-  
9 nation between providers of curricular activities, ini-  
10 tiatives, and units; and

11 (3) identify the common goals and differences  
12 among the participants at the conference.

13 (c) REPORT AND PUBLICATION.—At the conclusion  
14 of the conference the Director of the National Science  
15 Foundation shall—

16 (1) transmit to the Committee on Science of the  
17 House of Representatives and to the Committee on  
18 Commerce, Science, and Transportation of the Sen-  
19 ate a report on the outcome and conclusions of the  
20 conference, including an inventory of curricular ac-  
21 tivities, initiatives, and units, the content of the con-  
22 ference, and strategies developed that will support  
23 partnerships and leverage resources; and

24 (2) ensure that a similar report is published  
25 and distributed as widely as possible to stakeholders

1 in engineering, science, technology and mathematics  
2 education.

3 (d) AUTHORIZATION OF APPROPRIATIONS.—There  
4 are authorized to be appropriated for the National Science  
5 Foundation to carry out this section—

6 (1) \$300,000 for fiscal year 2002; and

7 (2) \$200,000 for each of fiscal years 2003 and  
8 2004.

9 **SEC. 206. GRANTS FOR DISTANCE LEARNING.**

10 (a) IN GENERAL.—The Director of the National  
11 Science Foundation may make competitive, merit-based  
12 awards to develop partnerships for distance learning of en-  
13 gineering, science, technology and mathematics education  
14 to a State or local educational agency or to an elementary,  
15 middle, or secondary school, under any grant program ad-  
16 ministered by the Director using funds appropriated to the  
17 National Science Foundation for activities in which dis-  
18 tance learning is integrated into the education process in  
19 grades kindergarten through the 12th grade.

20 (b) AUTHORIZATION OF APPROPRIATIONS.—There  
21 are authorized to be appropriated for the National Science  
22 Foundation to carry out this section \$5,000,000 for each  
23 of fiscal years 2002 through 2004.

1 **SEC. 207. SCHOLARSHIPS TO PARTICIPATE IN CERTAIN RE-**  
2 **SEARCH ACTIVITIES.**

3 (a) IN GENERAL.—The President, acting through the  
4 National Science Foundation, shall provide scholarships to  
5 teachers at public schools in grades kindergarten through  
6 the 12th grade in order that such teachers may participate  
7 in research programs conducted at private entities or Fed-  
8 eral or State government agencies. The purpose of such  
9 scholarships shall be to provide teachers with an oppor-  
10 tunity to expand their knowledge of engineering, science,  
11 technology, mathematics and research techniques.

12 (b) REQUIREMENTS.—In order to be eligible to re-  
13 ceive a scholarship under this section, a teacher described  
14 in subsection (a) shall be required to develop, in conjunc-  
15 tion with the private entity or government agency at which  
16 the teacher will be participating in a research program,  
17 a proposal to be submitted to the President describing the  
18 types of research activities involved.

19 (c) PERIOD OF PROGRAM.—Participation in a re-  
20 search program in accordance with this section may be  
21 for a period of one academic year or two sequential sum-  
22 mers.

23 (d) USE OF FUNDS.—The Director may only use  
24 funds for purposes of this section for salaries of scholar-  
25 ship recipients, administrative expenses (including infor-  
26 mation dissemination, direct mailing, advertising, and di-

1 rect staff costs for coordination and accounting services),  
 2 expenses for conducting an orientation program, reloca-  
 3 tion expenses, and the expenses of conducting final selec-  
 4 tion interviews.

5 (e) AUTHORIZATION OF APPROPRIATIONS.—There  
 6 are authorized to be appropriated for the National Science  
 7 Foundation to carry out this section \$5,000,000 for each  
 8 of fiscal years 2002 through 2004.

9 **SEC. 208. INTERAGENCY COORDINATION OF SCIENCE EDU-**  
 10 **CATION PROGRAMS.**

11 (a) INTERAGENCY COORDINATION COMMITTEE.—

12 (1) ESTABLISHMENT.—The Director of the Of-  
 13 fice of Science and Technology Policy shall establish  
 14 an interagency committee to coordinate Federal pro-  
 15 grams in support of science and mathematics edu-  
 16 cation at the elementary and secondary level.

17 (2) MEMBERSHIP.—The membership of the  
 18 committee shall consist of the heads, or designees, of  
 19 the National Science Foundation, the Department of  
 20 Energy, the National Aeronautics and Space Admin-  
 21 istration, the Department of Education, and other  
 22 Federal departments and agencies that have pro-  
 23 grams directed toward support of elementary and  
 24 secondary science and mathematics education.

25 (3) FUNCTIONS.—The committee shall—

1           (A) prepare a catalog of Federal research,  
2           development, demonstration and other pro-  
3           grams designed to improve elementary and sec-  
4           ondary science or mathematics education, in-  
5           cluding for each program a summary of its  
6           goals and the kinds of activities supported, a  
7           summary of accomplishments (including evi-  
8           dence of effectiveness in improving student  
9           learning), the funding level, and, for grant pro-  
10          grams, the eligibility requirements and the se-  
11          lection process for awards;

12           (B) review the programs identified under  
13          subparagraph (A) in order to—

14                   (i) determine the relative funding lev-  
15                   els among support for—

16                           (I) teacher professional develop-  
17                           ment;

18                           (II) curricular materials;

19                           (III) improved classroom teach-  
20                           ing practices;

21                           (IV) applications of computers  
22                           and related information technologies;  
23                           and

24                           (V) other major categories of ac-  
25                           tivities;

1                   (ii) assess whether the balance among  
2                   kinds of activities as determined under  
3                   clause (i) is appropriate and whether un-  
4                   necessary duplication or overlap among  
5                   programs exists;

6                   (iii) assess the degree to which the  
7                   programs assist the efforts of State and  
8                   local school systems to implement stand-  
9                   ards-based reform of science and mathe-  
10                  matics education, and group the programs  
11                  in the categories of high, moderate, and  
12                  low relevance for assisting standards-based  
13                  reform;

14                 (iv) for grant programs, identify ways  
15                 to simplify the application procedures and  
16                 requirements and to achieve greater con-  
17                 formity among the procedures and require-  
18                 ments of the agencies; and

19                 (v) evaluate the adequacy of the as-  
20                 sessment procedures used by the depart-  
21                 ments and agencies to determine whether  
22                 the goals and objectives of programs are  
23                 being achieved, and identify the best prac-  
24                 tices identified from the evaluation for as-  
25                 sessment of program effectiveness; and

1                   (C) monitor the implementation of the plan  
2                   developed under subsection (c) and provide to  
3                   the Director of the Office of Science and Tech-  
4                   nology Policy its findings and recommendations  
5                   for modifications to that plan.

6           (b) EXTERNAL REVIEW.—The Director of the Na-  
7           tional Science Foundation shall enter into an agreement  
8           with the National Research Council to conduct an inde-  
9           pendent review of programs as described in subsection  
10          (a)(3)(B) and to develop findings and recommendations.  
11          The findings and recommendations from the National Re-  
12          search Council review of programs shall be reported to the  
13          Director of the Office of Science and Technology Policy  
14          and to the Congress.

15          (c) EDUCATION PLAN.—

16               (1) PLAN CONTENTS.—On the basis of the find-  
17               ings of the review carried out in accordance with  
18               subsection (a)(3)(B) and taking into consideration  
19               the findings and recommendations of the National  
20               Research Council in accordance with subsection (b),  
21               the Director of the Office of Science and Technology  
22               Policy shall prepare a plan for Federal elementary  
23               and secondary science and mathematics education  
24               programs which shall include—

1           (A) a strategy to increase the effectiveness  
2 of Federal programs to assist the efforts of  
3 State and local school systems to implement  
4 standards-based reform of elementary and sec-  
5 ondary science and mathematics education;

6           (B) a coordinated approach for identifying  
7 best practices for the use of computers and re-  
8 lated information technologies in classroom in-  
9 struction;

10          (C) the recommended balance for Federal  
11 resource allocation among the major types of  
12 activities supported, including projected funding  
13 allocations for each major activity broken out  
14 by department and agency;

15          (D) identification of effective Federal pro-  
16 grams that have made measurable contributions  
17 to achieving standards-based science and math-  
18 ematics education reform;

19          (E) recommendations to the departments  
20 and agencies for actions needed to increase uni-  
21 formity across the Federal Government for ap-  
22 plication procedures and requirements for grant  
23 awards for support of elementary and secondary  
24 science and mathematics education; and



1 (F) dissemination procedures for repli-  
 2 eating results from effective programs, particu-  
 3 larly best practices for classroom instruction.

4 (2) CONSULTATION.—The Director shall con-  
 5 sult with academic, State, industry, and other appro-  
 6 priate entities engaged in efforts to reform science  
 7 and mathematics education as necessary and appro-  
 8 priate for preparing the plan under paragraph (1).

9 (d) REPORTS.—

10 (1) INITIAL REPORT.—The Director of the Of-  
 11 fice of Science and Technology Policy shall submit  
 12 to the Congress, not later than 1 year after the date  
 13 of the enactment of this Act, a report which—

14 (A) includes the plan described in sub-  
 15 section (c)(1);

16 (B) in accordance with subsection  
 17 (c)(1)(C), describes, for each department and  
 18 agency represented on the committee estab-  
 19 lished under subsection (a)(1), appropriate lev-  
 20 els of Federal funding;

21 (C) includes the catalog prepared under  
 22 subsection (a)(3)(A);

23 (D) includes the findings from the review  
 24 required under subsection (a)(3)(B)(iii);

1 (E) includes the findings and recommenda-  
 2 tions of the National Research Council devel-  
 3 oped under subsection (b); and

4 (F) describes the procedures used by each  
 5 department and agency represented on the com-  
 6 mittee to assess the effectiveness of its edu-  
 7 cation programs.

8 (2) ANNUAL UPDATES.—The Director of the  
 9 Office of Science and Technology Policy shall submit  
 10 to the Congress an annual update, at the time of the  
 11 President’s annual budget request, of the report sub-  
 12 mitted under paragraph (1), which shall include, for  
 13 each department and agency represented on the  
 14 committee, appropriate levels of Federal funding for  
 15 the fiscal year during which the report is submitted  
 16 and the levels proposed for the fiscal year with re-  
 17 spect to which the budget submission applies.

18 **SEC. 209. DEFINITIONS.**

19 In this title:

20 (1) INSTITUTION OF HIGHER EDUCATION.—The  
 21 term “institution of higher education” has the  
 22 meaning given that term by section 101 of the High-  
 23 er Education Act of 1965 (20 U.S.C. 1001).

24 (2) LOCAL AND STATE EDUCATIONAL AGEN-  
 25 CY.—The terms “local educational agency” and

1 “State educational agency” have the meanings given  
 2 such terms in section 14101 of the Elementary and  
 3 Secondary Education Act of 1965 (20 U.S.C. 8801).

## 4 **TITLE III—OTHER PROVISIONS**

### 5 **SEC. 301. WORK-STUDY AMENDMENTS.**

6 (a) TECHNOLOGY TRAINING TREATED AS COMMU-  
 7 NITY SERVICE.—Section 441(c) of the Higher Education  
 8 Act of 1965 (20 U.S.C. 2751(c)) is amended—

9 (1) in paragraph (1), by inserting “technology  
 10 training,” after “literacy training,”; and

11 (2) in paragraph (4)(A), by inserting before the  
 12 semicolon at the end the following: “, including tu-  
 13 toring teachers in the uses of classroom technology”.

14 (b) ADDITIONAL SPENDING FOR TECHNOLOGY  
 15 TRAINING.—Section 443(b)(2)(B) of the Higher Edu-  
 16 cation Act of 1965 (20 U.S.C. 2753(b)(2)(B)) is  
 17 amended—

18 (1) by striking “7 percent” and inserting “10  
 19 percent”;

20 (2) by inserting “(i)” after “shall ensure that”;  
 21 and

22 (3) by inserting after “requirement of this sub-  
 23 paragraph” the following: “, and (ii) at least 3 per-  
 24 cent of the total amount of funds granted to such  
 25 institution under this section for such fiscal year is

1       used to compensate students employed in technology  
2       training or tutoring teachers in the uses of class-  
3       room technology (or both),”.

4   **SEC. 302. STUDY.**

5       The Secretary of Commerce, in consultation with  
6   other Government agencies, appropriate organizations,  
7   and private businesses and corporations, shall conduct a  
8   study of—

9           (1) the feasibility and effectiveness of various  
10       incentives, including tax credits, for corporations  
11       and businesses to provide—

12                (A) personnel with regular compensation  
13       for time spent as volunteers engaged in the  
14       technological training of teachers; and

15                (B) facilities for the provision of such  
16       training of teachers;

17       (2) alternative methods of providing financial  
18       support, through income tax credits, loan forgive-  
19       ness, or otherwise, to individuals seeking training or  
20       retraining in engineering, science, technology and  
21       mathematics education;

22       (3) the effectiveness of colleges and universities  
23       in training teachers who are able to use technology  
24       and able to integrate technology into lesson plans  
25       and curricula, including distance learning;

1           (4) methods to coordinate a working alliance at  
2       various levels of government between the business  
3       and academic community; and

4           (5) additional means of improving the efficiency  
5       of the technological training of teachers.

6 **SEC. 303. REPORT TO CONGRESS.**

7       Not later than one year after the date of the enact-  
8       ment of this Act, the Secretary of Commerce shall trans-  
9       mit to the Congress a report outlining the results of the  
10      study conducted under section 302. Such report shall in-  
11      clude proposals for a comprehensive approach to providing  
12      technologically competent teachers to our Nation's schools.  
13      With respect to any objectives described in paragraphs (1)  
14      though (5) of section 302 that the Secretary determines  
15      are feasible and effective, such report shall include a plan  
16      for accomplishing such objectives.

○