I

107TH CONGRESS
1ST SESSION

H. R. 1693

To improve science, mathematics, and technology education in elementary and secondary schools, advance knowledge on the effective uses of information technologies in education, increase participation in science, mathematics, and engineering careers by groups underrepresented in those fields, provide for more effective coordination of public and private sector efforts to improve science, mathematics, and technology education, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 3, 2001

Mr. HALL of Texas (for himself, Ms. EDDIE BERNICE JOHNSON of Texas, Ms. WOOLSEY, Mr. BARCIA, Mr. ETHERIDGE, Mr. UDALL of Colorado, Mr. LARSON of Connecticut, Mr. GORDON, Mr. COSTELLO, Ms. RIVERS, Ms. JACKSON-LEE of Texas, Mr. BACA, Mr. LAMPSON, Mr. MATHESON, Mr. HOEFFEL, and Mr. ISRAEL) introduced the following bill; which was referred to the Committee on Science, and in addition to the Committee on Education and the Workforce, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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A BILL

To improve science, mathematics, and technology education in elementary and secondary schools, advance knowledge on the effective uses of information technologies in education, increase participation in science, mathematics, and engineering careers by groups underrepresented in those fields, provide for more effective coordination of public and private sector efforts to improve science,

mathematics, and technology education, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Science Education for the 21st Century Act''.

SEC. 2. FINDINGS AND OBJECTIVES.

(a) FINDINGS.—Congress finds the following:

(1) The quality of education in science, mathematics, and engineering is the foundation of the Nation's future security and prosperity.

(2) The achievement of scientific and mathematical literacy by all people in the United States is an essential goal of all efforts to strengthen the Nation's competitiveness in the global marketplace.

(3) Elementary and secondary students in the United States have demonstrated relatively poor performance in science and mathematics in international comparison studies.

(4) Women and minorities, who constitute a growing percentage of the Nation's workforce, are significantly underrepresented in many fields of science, mathematics, and engineering.

(5) The presence of highly qualified teachers in the classroom is a key factor in attaining satisfac-

tory student achievement in science and mathematics, but the National Center for Education Statistics reports that 34 percent of public school mathematics teachers and nearly 40 percent of science teachers lack even an academic minor in their primary teaching fields.

(6) The Department of Education has estimated that more than 240,000 new science and mathematics elementary and secondary school teachers will be needed during the next decade.

(7) Improved undergraduate education for new teachers could be achieved through closer collaboration among education faculty and science, mathematics, and engineering faculty of institutions of higher education to design and implement better curricular materials and more effective courses of instruction.

(8) Rigorous professional development activities for in-service teachers are needed to improve both content knowledge and pedagogical skills for science, mathematics, and technology teachers.

(9) Research and large-scale demonstration projects are needed to identify and quantify best practices and the most effective applications of educational technologies in the classroom.

(10) Greater effort is needed to cultivate the interest of women and minorities in studying science and mathematics and in encouraging and adequately preparing individuals from underrepresented groups to pursue careers in science, mathematics, and engineering.

(11) Federal science and mathematics education programs should be closely coordinated to have the maximum effectiveness in assisting State and local school systems to improve student performance in science and mathematics.

(b) NATIONAL OBJECTIVES.—Congress declares that the following shall be national objectives:

(1) To improve the quality of science and mathematics education available to all people in the United States.

(2) To encourage students in the United States to pursue postsecondary studies in science, mathematics, and engineering.

(3) To substantially increase the numbers of women and minorities pursuing careers in mathematics, science, and engineering.

SEC. 3. DEFINITIONS.

In this Act:

(1) The term ''science teacher'' means a science, mathematics, or technology teacher at the elementary or secondary school level.

(2) The term ''Director'' means the Director of the National Science Foundation.

(3) The term ''institution of higher education'' has the meaning given that term in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001).

(4) The term ''local educational agency'' has the meaning given that term in section 14101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801), except that in the case of Hawaii, the District of Columbia, and the Commonwealth of Puerto Rico, the term ''local educational agency'' shall be deemed to mean the State educational agency.

(5) The term ''State educational agency'' has the meaning given that term in section 14101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801).

TITLE I—PRESERVICE TRAINING AND PROFESSIONAL DEVELOPMENT FOR SCIENCE TEACHERS

SEC. 101. SCIENCE TEACHER SCHOLARSHIPS FOR SCIENTISTS AND ENGINEERS.

(a) PROGRAM AUTHORIZED.—The Director is authorized to make awards to institutions of higher education to provide scholarships to assist graduates of baccalaureate degree programs in science, mathematics, or engineering, or individuals pursuing degrees in those fields, to fulfill the academic requirements necessary to become certified as science teachers. Such awards shall be made through competitive, merit-based procedures.

(b) SCHOLARSHIP AMOUNT AND DURATION.—Each scholarship provided pursuant to subsection (a) shall be in the amount of $7,500 and shall cover a period of 1 year.

(c) REQUIREMENTS.—

(1) ELIGIBILITY.—Institutions of higher education offering baccalaureate degrees in science, mathematics, and engineering and coursework toward teacher certification are eligible to apply for awards under the program established by subsection

(a). Such institutions may provide scholarships using such awards to individuals who are—

(A) undergraduate students majoring in science, mathematics, or engineering, who are within 1 academic year of completion of degree requirements; or

(B) graduates of baccalaureate or advanced degree programs in science, mathematics, or engineering.

(2) GUIDELINES, PROCEDURES, AND CRITERIA.—The Director shall establish and publish application and selection guidelines, procedures, and criteria for the program established by subsection (a).

(3) REQUIREMENTS FOR SCHOLARSHIP APPLICATIONS.—Each application for a scholarship under this section shall include a plan specifying the course of study that will allow the applicant to fulfill the academic requirements for obtaining a teaching certificate during the scholarship period.

(4) WORK REQUIREMENT.—As a condition of acceptance of a scholarship under this section, a recipient shall agree to work as a science teacher for a minimum of 2 years following certification as such

a teacher or to repay the amount of the scholarship to the National Science Foundation.

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

SEC. 102. COLLABORATIONS FOR IMPROVING SCIENCE TEACHER EDUCATION.

(a) PROGRAM AUTHORIZED.—The Director is authorized to establish a program to improve the undergraduate education and in-service professional development of science teachers. Under the program, competitive awards shall be made on the basis of merit to institutions of higher education that offer baccalaureate degrees in education, science, and mathematics.

(b) PROGRAM REQUIREMENTS.—

(1) USES OF FUNDS.—Awards made under subsection (a) shall be used for developing—

(A) courses and curricular materials for—

(i) the preparation of undergraduate students pursuing education degrees who intend to serve as science teachers; or

(ii) the in-service professional development of science teachers; and

(B) educational materials and instructional techniques incorporating innovative uses of information technology.

(2) GUIDELINES, PROCEDURES, AND CRITERIA.—The Director shall establish and publish application and selection guidelines, procedures, and criteria for the program established by subsection (a).

(3) PROPOSAL REQUIREMENTS.—Each proposal for an award under the program shall—

(A) involve a collaboration among education, mathematics, and science faculty and shall include a plan for maintaining the collaboration beyond the period of the award; and

(B) include a description of the in-service professional development activities for science teachers that will be offered by the awardee.

(4) SPECIAL PROPOSAL EVALUATION CRITERIA.—In making awards under this section, the Director shall consider—

(A) the degree to which courses and materials proposed to be developed in accordance with paragraph (1) combine content knowledge and pedagogical techniques that are consistent with hands-on, inquiry-based teaching, are

aligned with established national science or mathematics standards, and are based on validated education research findings; and

(B) evidence of a strong commitment by the administrative heads of the schools and departments of the institutions of higher education whose faculty are involved in preparing a proposal to the program to provide appropriate rewards and incentives to encourage continued faculty participation in the collaborative activity.

(c) INTERNET-BASED TEACHER PROFESSIONAL DEVELOPMENT.—Awards made under subsection (a) may include support for the development of courses, curricular materials, and other resources for in-service professional development of science teachers that are—

(1) made available to science teachers through the Internet; and

(2) developed in collaboration with schools or school systems with demonstrated experience in computer-based and networked teacher professional development activities.

(d) COORDINATION.—The Director shall ensure that coordination and exchange of information occur on a continuing basis between awardees under this section and the

National Science Foundation's Centers for Learning and Teaching.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation to carry out this section $25,000,000 for each of fiscal years 2002 through 2004.

SEC. 103. MASTER SCIENCE TEACHERS.

(a) PROGRAM AUTHORIZED.—The Director is authorized to make competitive, merit-based awards to State or local educational agencies for the purposes of implementing a plan for the development and use of master science teachers for kindergarten through grade 8, as described in subsection (b).

(b) PLAN.—In order to be eligible to receive a grant under this section, a State or local educational agency shall submit to the Director a plan providing for the development and use of such master teachers. The plan shall include—

(1) a description of the relationship master teachers will have to other administrative and managerial staff and the State and local educational agency, the ratio of master teachers to other teachers, and the requirements for a master teacher of the State or local educational agency, including a description of certification requirements;

(2) a plan for ongoing professional development; and

(3) a description of job responsibilities of the master teachers, including a discussion of the responsibilities master teachers will have for—

(A) development or implementation of science, mathematics, engineering, or technology curriculums;

(B) in-classroom assistance;

(C) authority over hands-on inquiry materials, equipment, and supplies;

(D) mentoring other teachers or fulfilling any leadership role; and

(E) professional development, including training of other master teachers or other teachers, or developing or implementing professional development programs.

(c) USE OF FUNDS.—Funds provided by the program established under subsection (a) shall be available—

(1) to support professional development activities for master teachers, including reimbursement for travel and expenses and stipends for summer programs;

(2) to support participation of master teachers during the summer in research programs conducted

at private entities or government facilities, including salaries for the period of participation in the research and reimbursement of expenses;

(3) to provide educational materials and equipment; and

(4) to provide computer equipment and network connectivity necessary to enable master teachers to collaborate with other master teachers, to access educational materials available online and to communicate with scientists or other mentors at remote locations.

(d) PRIORITY.—The Director shall give special priority in making awards under this section to eligible entities having a low proportion of certified science teachers among teachers assigned to science, mathematics, or technology classroom instruction.

(e) ASSESSMENT OF EFFECTIVENESS.—The Director shall put in place mechanisms to assess the effectiveness of activities carried out under this section, including the means to obtain quantitative evidence of trends in student performance in mathematics and science at the schools having master teachers.

(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science

Foundation to carry out this section $25,000,000 for each of fiscal years 2002 through 2004.

SEC. 104. ASSESSMENT OF IN-SERVICE TEACHER PROFESSIONAL DEVELOPMENT PROGRAMS.

(a) ASSESSMENT.—The Director shall review all programs sponsored by the National Science Foundation that support in-service teacher professional development for science teachers to determine—

(1) the level of resources and degree of emphasis placed on training teachers in the effective use of information technology in the classroom; and

(2) the allocation of resources between summer activities and follow-on reinforcement training and support to participating teachers during the school year.

(b) SPECIAL REQUIREMENTS.—On the basis of the assessment under subsection (a), the Director shall take such action as necessary to—

(1) ensure that the type of activities described under subsection (a)(1) constitute a major component of the future in-service teacher professional development efforts of the National Science Foundation; and

(2) provide adequate resources for school- and district-level professional development activities that

will provide continuing opportunities during the school year for science teachers to improve their subject knowledge and pedagogical skills.

(c) REPORT.—The Director shall submit to Congress, not later than 1 year after the date of the enactment of this Act, a report that—

(1) describes the results of the review and assessment conducted under subsection (a);

(2) summarizes the major categories of in-service teacher professional development activities supported at the time of the review, and the funding levels for such activities; and

(3) describes any proposed changes, including new funding allocations, to strengthen the in-service teacher professional development programs of the National Science Foundation and to address the requirements of subsection (b).

TITLE II—EDUCATIONAL TECHNOLOGY

SEC. 201. RESEARCH ON EFFECTIVE EDUCATIONAL TECHNOLOGIES.

(a) PROGRAM AUTHORIZED.—

(1) IN GENERAL.—The Director and the Secretary of Education are authorized to establish a research program to determine the most effective edu-

cational uses of information technologies in elementary and secondary school classrooms. The program shall be carried out through competitive, merit-based awards to consortia of institutions of higher education and elementary and secondary schools or school systems.

(2) GUIDELINES, PROCEDURES, AND CRITERIA.—The Director and the Secretary shall establish and publish application and selection guidelines, procedures, and criteria for the program established by paragraph (1).

(b) IDENTIFICATION OF TECHNOLOGY-BASED APPROACHES.—The program established under subsection (a) shall identify educational approaches and techniques that are based on the use of information technology and that have the potential for being effective in classroom instruction in elementary or secondary schools. Criteria for determining the potential educational effectiveness of the approaches and techniques identified shall include—

(1) the consistency of the approaches and techniques with the current state of knowledge on human cognition and learning;

(2) evidence of the approaches and techniques having been developed through collaborations involv-

ing content specialists, experts in information technology, and educational practitioners; and

(3) evidence of the capability of the approaches and techniques to be adapted to different educational settings.

(c) EXPERIMENTS.—

(1) EXPERIMENTS REQUIRED.—The program established under subsection (a) shall include the design and conduct of experiments in elementary and secondary school classrooms to evaluate the effectiveness of the approaches and techniques identified under subsection (b). The experiments shall be designed to determine—

(A) the educational effectiveness of the approaches and techniques studied in terms of student performance as described under subsection (d);

(B) the key variables that influence educational effectiveness; and

(C) the conditions necessary to implement successfully an approach or technique determined to be educationally effective for a particular educational setting.

(2) REQUIREMENTS FOR EXPERIMENTS.—The experiments under paragraph (1) shall involve a sub-

stantial number of students and be conducted in a wide range of educational settings to ensure variation in—

(A) grade level;

(B) geographic location of the participating schools;

(C) socioeconomic characteristics of the communities in which participating schools are located;

(D) level of student ability; and

(E) qualifications and experience of participating teachers.

(3) MOST EFFECTIVE APPROACHES AND TECHNIQUES.—Educational approaches and techniques found to be most effective and to have the most promise for being replicated successfully shall be highlighted in the documentation required in accordance with subsection (e).

(d) EDUCATIONAL ASSESSMENTS.—The program established under subsection (a) shall include development of metrics and assessment procedures, including procedures based on the application of information technology, for determining the academic performance of students involved in the experiments under subsection (c). The assessment procedures shall be incorporated in the design

of the experiments and shall be used to determine student performance over a multiyear period.

(e) DOCUMENTATION AND DISSEMINATION OF RESULTS.—

(1) IN GENERAL.—The results of the experiments conducted in accordance with subsection (c) shall be documented and widely disseminated, including through publication in peer-reviewed scholarly journals.

(2) WORKSHOPS, CONFERENCES, AND WEB SITES.—The Director and the Secretary are authorized to sponsor and support workshops, conferences, and dedicated web sites to disseminate information about the program established under subsection (a) and about results obtained by the program.

(3) DEPOSIT IN LIBRARY.—Information about effective approaches and techniques, including information and materials necessary for their implementation, as determined by the experiments under subsection (c), shall be deposited in the National Science, Mathematics, Engineering, and Technology Education Digital Library.

(f) SPECIAL CONSIDERATION REQUIRED FOR CERTAIN PROPOSALS.—In making awards under the program established by subsection (a), the Director and the Sec-

retary shall give special consideration to proposals that are judged to be likely to attract and adequately support graduate students to pursue research on the use of information technology in education and research at the intersection of educational practice and basic research on human cognition and learning.

(g) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section $50,000,000 for fiscal year 2002, $75,000,000 for fiscal year 2003, and $150,000,000 for fiscal year 2004.

SEC. 202. EDUCATIONAL TECHNOLOGY UTILIZATION EXTENSION ASSISTANCE.

(a) PURPOSE.—The purpose of this section is to improve the utilization of educational technologies in elementary and secondary education by creating an educational technology extension service based at intermediate school districts, regional education service agencies, or undergraduate institutions of higher education.

(b) FINDINGS.—Congress finds the following:

(1) Extension services such as the Manufacturing Extension Partnership and the Agricultural Extension Service have proven to be effective public-private partnerships to integrate new technologies and to improve utilization of existing technologies by

small to medium sized manufacturers and the United States agricultural community.

(2) Undergraduate institutions of higher education working with nonprofit organizations and State and Federal agencies can tailor educational technology extension programs to meet specific local and regional requirements.

(3) Undergraduate institutions of higher education, often with the assistance of the National Science Foundation, have during the past 20 years been integrating educational technologies into their curriculums, and as such can draw upon their own experiences to advise elementary and secondary school educators on ways to integrate a variety of educational technologies into the educational process.

(4) Many elementary and secondary school systems, particularly in rural and traditionally underserved areas, lack general information on the most effective methods to integrate their existing technology infrastructure, as well as new educational technology, into the educational process and curriculum.

(5) Most Federal and State educational technology programs have focused on acquiring edu-

cational technologies with less emphasis on the utilization of those technologies in the classroom and the training and infrastructural requirements needed to efficiently support those types of technologies. As a result, in many instances, the full potential of educational technology has not been realized.

(6) Our global economy is increasingly reliant on a workforce not only comfortable with technology, but also able to integrate rapid technological changes into the production process. As such, in order to remain competitive in a global economy, it is imperative that we maintain a work-ready labor force.

(7) According to ''Teacher Quality: A Report on the Preparation and Qualifications of Public School Teachers'', prepared by the Department of Education, only 1 in 5 teachers felt well prepared to work in a modern classroom.

(8) The most common form of professional development for teachers continues to be workshops that typically last no more than 1 day and have little relevance to teachers' work in the classroom.

(9) A 1998 national survey completed by the Department of Education found that only 19 percent of teachers had been formally mentored by an-

other teacher, and that 70 percent of these teachers felt that this collaboration was very helpful to their teaching.

(c) PROGRAM AUTHORIZED.—

(1) GENERAL AUTHORITY—The Director, in cooperation with the Secretary of Education and the Director of the National Institute of Standards and Technology, is authorized to provide assistance for the creation and support of regional centers for the utilization of educational technologies (hereinafter in this section referred to as ''ETU Centers'').

(2) FUNCTIONS OF CENTERS—

(A) ESTABLISHMENT.—ETU Centers may be established at any intermediate school district, regional education service agency, institution of higher education, or consortium of such entities, but such Centers may include the participation of nonprofit entities.

(B) OBJECTIVES OF CENTERS.—The objective of ETU Centers is to enhance the utilization of educational technologies in elementary and secondary education through—

(i) advising elementary and secondary school administrators, school boards, and teachers on the adoption and utilization of

new educational technologies and the utility of local schools' existing educational technology assets and infrastructure;

(ii) participation of individuals from the private sector, universities, State and local governments, and other Federal agencies;

(iii) active dissemination of technical and management information about the use of educational technologies; and

(iv) utilization, if appropriate, of the expertise and capabilities that exist in Federal laboratories and Federal agencies.

(C) ACTIVITIES OF CENTERS.—The activities of ETU Centers shall include the following:

(i) The active transfer and dissemination of research findings and ETU Center expertise to local school authorities, including school administrators, school boards, and teachers.

(ii) The training of teachers in the integration of local schools' existing educational technology infrastructure into their instructional design.

(iii) The training and advising of teachers, administrators, and school board members in the acquisition, utilization, and support of educational technologies.

(iv) Support services to teachers, administrators, and school board members as agreed upon by ETU Center representatives and local school authorities.

(v) The advising of teachers, administrators, and school board members on current skill set standards employed by private industry.

(3) PROGRAM ADMINISTRATION.—

(A) PROPOSED RULES.—The Director, after consultation with the Secretary of Education and the Director of the National Institute of Standards and Technology, shall publish in the Federal Register, not later than 90 days after the date of the enactment of this Act, proposed rules for the program for establishing ETU Centers, including—

(i) a description of the program;

(ii) the procedures to be followed by applicants;

(iii) the criteria for determining qualified applicants; and

(iv) the criteria, including those listed in this section, for choosing recipients of financial assistance under this section from among qualified applicants.

(B) FINAL RULES.—The Director shall publish final rules for the program under this section after the expiration of a 30-day comment period on such proposed rules.

(4) ELIGIBILITY AND SELECTION.—

(A) APPLICATIONS REQUIRED.—Any intermediate school district, regional education service agency, undergraduate institution of higher education, or consortium of any of those entities may submit an application for financial support under this section in accordance with the procedures established under this section. In order to receive assistance under this section, an applicant shall provide adequate assurances that the applicant will contribute 50 percent or more of the proposed ETU Center's capital and annual operating and maintenance costs.

(B) SELECTION.—The Director, in conjunction with the Secretary of Education and the Director of the National Institute of Standards and Technology, shall subject each application to competitive, merit-based review. In making a decision whether to approve such application and provide financial support under this section, the Director of the National Science Foundation shall consider, at a minimum—

(i) the merits of the application, particularly those portions of the application regarding the adaptation of training and educational technologies to the needs of particular regions;

(ii) the quality of service to be provided;

(iii) the geographical diversity and extent of service area, with particular emphasis on rural and traditionally underdeveloped areas; and

(iv) the percentage of funding and amount of in-kind commitment from other sources.

(C) EVALUATION.—Each ETU Center that receives financial assistance under this section

shall be evaluated during its third year of operation by an evaluation panel appointed by the Director. Each evaluation panel shall measure the involved ETU Center's performance against the objectives specified in this section. Funding for an ETU Center shall not be renewed unless the evaluation is positive.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation to carry out this section $7,000,000 for fiscal year 2002, $8,500,000 for fiscal year 2003, and $9,500,000 for fiscal year 2004.

SEC. 203. NATIONAL SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY EDUCATION DIGITAL LIBRARY.

In addition to any amounts otherwise authorized, there are authorized to be appropriated to the National Science Foundation for the National Science, Mathematics, Engineering, and Technology Education Digital Library $10,000,000 for fiscal year 2002, $15,000,000 for fiscal year 2003, and $17,500,00 for fiscal year 2004. Such additional amounts shall be used primarily for activities focused on development of precollege education collections and support services for science teachers and school administrators, and uses of the amounts may include—

(1) production of educational materials designed to take maximum advantage of the Library's architecture and services;

(2) evaluation of materials to determine whether such materials are aligned with established nationally recognized science and mathematics standards for knowledge of students at different grade levels; and

(3) assistance to schools or school systems in the selection of curricular materials.

SEC. 204. STUDY OF BROADBAND NETWORK ACCESS FOR SCHOOLS AND LIBRARIES.

(a) REPORT TO CONGRESS.—The Director shall conduct a study of the issues described in subsection (c), and not later than 1 year after the date of the enactment of this Act, transmit to Congress a report including recommendations to address those issues. Such report shall be updated annually for 6 additional years.

(b) CONSULTATION.—In preparing the reports under subsection (a), the Director shall consult with the National Aeronautics and Space Administration, the National Institute of Standards and Technology, and such other Federal agencies and educational entities as the Director considers appropriate.

(c) ISSUES.—The reports shall—

(1) identify the current status of high-speed, large bandwidth capacity access to all public elementary and secondary schools and libraries in the United States;

(2) identify how the provision of high-speed, large bandwidth capacity access to the Internet to such schools and libraries can be effectively utilized within each school and library;

(3) consider the effect that specific or regional circumstances may have on the ability of such institutions to acquire high-speed, large bandwidth capacity access to achieve universal connectivity as an effective tool in the education process; and

(4) include options and recommendations for the various entities responsible for elementary and secondary education to address the challenges and issues identified in the reports.

SEC. 205. BROADBAND DEMONSTRATION PROJECTS.

(a) PROJECTS AUTHORIZED.—As part of the Next Generation Internet activities authorized under section 103(a)(3) of the High-Performance Computing Act of 1991 (15 U.S.C. 5513(a)(3)), the agencies participating in the Next Generation Internet program are authorized to provide such broadband Internet connections to schools as necessary to conduct demonstration projects to deter-

mine the uses and effectiveness of broadband connections in science, mathematics, and technology education in elementary and secondary schools. The projects shall be carried out in coordination with the experiments authorized under section 201.

(b) ASSESSMENTS.—The agencies sponsoring projects under subsection (a) shall identify metrics to assess the educational effectiveness of the projects, put in place procedures to make such an assessment for each project supported, and document and disseminate the findings of the assessments. Descriptions of the projects and the findings of the assessments of projects shall be included in the reports required under section 204(a).

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section $10,000,000 for each of fiscal years 2002 through 2004.

TITLE III—INCREASING PARTICIPATION BY UNDERREPRESENTED GROUPS IN SCIENCE AND ENGINEERING

SEC. 301. MATHEMATICS AND SCIENCE PROFICIENCY PARTNERSHIPS.

(a) FINDINGS.—Congress finds the following:

(1) Proficiency in mathematics, science, and information technology is necessary to prepare all stu-

dents in the United States for participation in the 21st Century and to guarantee that the United States economy remains vibrant and competitive.

(2) In order to achieve such results, it is important that the Federal Government shows interest in economically disadvantaged students who have not been provided with opportunities that will improve their knowledge of mathematics, science, and technology.

(3) Many economically disadvantaged students in urban and rural America share a common need to receive a quality education, but often the schools of such students lack the needed resources to lift those students into the information age.

(4) The schools and businesses serving urban and rural communities are strategically positioned to form a unique partnership with students that will increase their mathematics, science, and technology proficiency and encourage and support their undergraduate study in those fields for the benefit of the Nation.

(b) AUTHORITY.—

(1) IN GENERAL.—

(A) GRANT PROGRAM.—The Director shall establish a demonstration project under which

the Director awards grants in accordance with this section to eligible local educational agencies.

(B) USES OF FUNDS.—A local educational agency that receives a grant under this section may use such grant funds to develop a program that builds or expands mathematics, science, and information technology curricula, to purchase equipment necessary to establish such program, and to provide professional development to enhance teacher quality in those fields.

(2) PROGRAM REQUIREMENTS.—A program described in paragraph (1) shall—

(A) provide teacher professional development specifically in information technology, mathematics, and science; and

(B) provide students with a rich standards-based course of study in mathematics, science, and information technology.

(c) ELIGIBLE LOCAL EDUCATIONAL AGENCIES.—For purposes of this section, a local educational agency is eligible to receive a grant under this section if the agency—

(1) provides assurances that it has executed conditional agreements with representatives of the

private sector to provide services and funds described in subsection (d); and

(2) agrees to enter into an agreement with the Director to comply with the requirements of this section.

(d) PRIVATE SECTOR PARTICIPATION.—The conditional agreements referred to in subsection (c)(1) shall describe participation by the private sector, including—

(1) the donation of computer hardware, software, and other technology tools;

(2) the establishment of internship and mentoring opportunities for students who participate in the mathematics, science, and information technology program; and

(3) the donation of higher education scholarship funds for eligible students to continue their study of mathematics, science, and information technology.

(e) APPLICATION.—

(1) IN GENERAL.—To apply for a grant under this section, each eligible local educational agency shall submit an application to the Director in accordance with guidelines established by the Director pursuant to paragraph (2).

(2) GUIDELINES.—

(A) REQUIREMENTS.—The guidelines referred to in paragraph (1) shall require, at a minimum, that the application include—

(i) a description of proposed activities consistent with the uses of funds and program requirements under paragraphs (1)(B) and (2) of subsection (b);

(ii) a description of the higher education scholarship program, including criteria for selection, duration of scholarship, number of scholarships to be awarded each year, and funding levels for scholarships; and

(iii) evidence of private sector participation and financial support to establish an internship, mentoring, and scholarship program.

(B) GUIDELINE PUBLICATION.—The Director shall issue and publish such guidelines not later than 6 months after the date of the enactment of this Act.

(3) SELECTION.—The Director shall select a local educational agency to receive an award under this section on the basis of merit to be determined after conducting a comprehensive review.

(f) PRIORITY.—The Director shall give special priority in awarding grants under this section to eligible local educational agencies that—

(1) demonstrate the greatest ability to obtain commitments from representatives of the private sector to provide services and funds described under subsection (d); and

(2) demonstrate the greatest economic need.

(g) ASSESSMENT.—The Director shall assess the effectiveness of activities carried out under this section.

(h) STUDY AND REPORT.—The Director—

(1) shall initiate an evaluative study of the effectiveness of the activities carried out under this section in improving student performance in mathematics, science, and information technology at the precollege level and in stimulating student interest in pursuing undergraduate studies in those fields; and

(2) shall report the findings of the study to Congress not later than 4 years after the award of the first scholarship.

Such report shall include the number of students graduating from an institution of higher education with a major in mathematics, science, or information technology

and the number of students who find employment in such fields.

(i) DEFINITIONS.—In this section:

(1) The term ''conditional agreement'' means an arrangement between representatives of the private sector and local educational agencies to provide certain services and funds, such as, but not limited to, the donation of computer hardware and software, the establishment of internship and mentoring opportunities for students who participate in mathematics, science, and information technology programs, and the donation of scholarship funds for use at institutions of higher education by eligible students who have participated in the mathematics, science, and information technology programs.

(2) The term ''eligible student'' means a student enrolled in the 12th grade who—

(A) has participated in a mathematics, science, and an information technology program established pursuant to this section;

(B) has demonstrated a commitment to pursue a career in information technology, mathematics, science, or engineering; and

(C) has attained high academic standing and maintains a grade point average of not less

than 2.7 on a 4.0 scale for the period from the beginning of the 10th grade through the time of application for a scholarship.

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

(k) MAXIMUM GRANT AWARD.—An award made to an eligible local educational agency under this section may not exceed $300,000.

SEC. 302. GO GIRL GRANTS.

(a) SHORT TITLE.—This section may be cited as the ''Getting Our Girls Ready for the 21st Century Act (Go Girl Act)''.

(b) FINDINGS.—Congress finds the following:

(1) Women have historically been underrepresented in science, mathematics, engineering, and technology occupations.

(2) Female students take fewer high-level mathematics and science courses in high school than male students.

(3) Female students take far fewer advanced computer classes and tend to take only the basic data entry and word processing classes compared to courses that male students take.

(4) Female students earn fewer bachelors, masters, and doctoral degrees in science, mathematics, engineering, and technology than male students.

(5) Early career exploration is key to choosing a career.

(6) Teachers' attitudes, methods of teaching, and classroom atmosphere affect females' interest in nontraditional fields.

(7) Stereotypes about appropriate careers for females, a lack of female role models, and a lack of basic career information significantly deter girls' interest in science, mathematics, engineering, and technology careers.

(8) Females consistently rate themselves significantly lower than males in computer ability.

(9) Limited access is a hurdle faced by females seeking jobs in science, mathematics, engineering, and technology.

(10) Common recruitment and hiring practices make extensive use of traditional networks that often overlook females.

(c) PROGRAM AUTHORITY.—

(1) IN GENERAL.—The Director is authorized to provide grants to and enter into contracts or cooperative agreements with local educational agencies

and institutions of higher education to encourage the ongoing interest of girls in science, mathematics, engineering, and technology and to prepare girls to pursue undergraduate and graduate degrees and careers in science, mathematics, engineering, or technology.

(2) APPLICATION.—

(A) IN GENERAL.—To be eligible to receive a grant under this section, a local educational agency or institution of higher education shall submit an application to the Director at such time, in such form, and containing such information as the Director may reasonably require.

(B) CONTENTS.—The application referred to in subparagraph (A) shall contain, at a minimum, the following:

(i) A specific program description, including the content of the program and the research and models used to design the program.

(ii) A description of how an eligible entity will provide for collaboration between elementary and secondary school programs to fulfill goals of the grant program.

(iii) An explanation regarding the recruitment and selection of participants.

(iv) A description of the instructional and motivational activities planned to be used.

(v) An evaluation plan.

(d) USES OF FUNDS FOR ELEMENTARY SCHOOL PROGRAM.—Under grants awarded pursuant to subsection (c), funds may be used for the following:

(1) Encouraging girls in grades 4 through 8 to enjoy and pursue studies in science, mathematics, engineering, and technology.

(2) Acquainting such girls with careers in science, mathematics, engineering, and technology.

(3) Educating the parents of such girls about the difficulties faced by girls to maintain an interest and desire to achieve in science, mathematics, engineering, and technology, and enlisting the help of the parents in overcoming these difficulties.

(4) Tutoring of such girls in reading, science, mathematics, engineering, and technology.

(5) Mentoring relationships for such girls, both in person and through the Internet.

(6) Paying the costs for such girls of attending events and academic programs in science, mathematics, engineering, and technology.

(7) After-school activities designed to encourage the interest of such girls in science, mathematics, engineering, and technology.

(8) Summer programs for such girls designed to encourage interest in, and develop skills in, science, mathematics, engineering, and technology.

(9) Purchasing software designed for such girls, or designed to encourage such girls' interest in science, mathematics, engineering, and technology.

(10) Field trips for such girls to locations that educate and encourage such girls' interest in science, mathematics, engineering, and technology.

(11) Field trips to locations that acquaint such girls with careers in science, mathematics, engineering and technology.

(12) Purchasing and disseminating information to parents of such girls that will help parents to encourage their daughters' interest in science, mathematics, engineering, and technology.

(e) USES OF FUNDS FOR SECONDARY SCHOOL PROGRAM.—Under grants awarded pursuant to subsection (c), funds may be used for the following:

(1) Encouraging girls in grades 9 and higher to major in science, mathematics, engineering, and technology in a postsecondary institution.

(2) Providing academic advice and assistance in high school course selection for such girls.

(3) Encouraging such girls to plan for careers in science, mathematics, engineering, and technology.

(4) Educating the parents of such girls about the difficulties faced by girls to maintain an interest and desire to achieve in science, mathematics, engineering, and technology, and enlisting the help of the parents in overcoming these difficulties.

(5) Tutoring for such girls in science, mathematics, engineering, and technology.

(6) Mentoring relationships for such girls, both in person and through the Internet.

(7) Paying the costs for such girls of attending events and academic programs in science, mathematics, engineering, and technology.

(8) Paying 50 percent of the cost of internships for such girls in science, mathematics, engineering, or technology.

(9) After-school activities designed to encourage the interest of such girls in science, mathematics,

engineering, and technology, including the cost of that portion of a staff salary to supervise these activities.

(10) Summer programs for such girls designed to encourage interest in and develop skills in science, mathematics, engineering, and technology.

(11) Purchasing software designed for such girls, or designed to encourage such girls' interest in science, mathematics, engineering, and technology.

(12) Field trips for such girls to locations that educate and encourage such girls' interest in science, mathematics, engineering, and technology.

(13) Field trips to locations that acquaint such girls with careers in science, mathematics, engineering, and technology.

(14) Visits to institutions of higher education to acquaint such girls with college-level programs in science, mathematics, engineering, or technology, and to meet with educators and female college students who will encourage them to pursue degrees in science, mathematics, engineering, and technology.

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

SEC. 303. ARTICULATION PARTNERSHIPS BETWEEN COMMUNITY COLLEGES AND SECONDARY SCHOOLS.

(a) OUTREACH GRANTS.—In making awards for outreach grants authorized under section 3(c)(2) of the Scientific and Advanced-Technology Act of 1992 (42 U.S.C. 1862i(c)(2)), the Director shall give priority to proposals that involve secondary schools with a majority of students from groups that are underrepresented in the science, mathematics and engineering workforce. Awards in such cases shall not be subject to the requirement under section 3(f)(3) of such Act for a matching contribution.

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

TITLE IV—COORDINATION OF SCIENCE EDUCATION PROGRAMS

SEC. 401. INTERAGENCY COORDINATION COMMITTEE.

(a) ESTABLISHMENT.—The Director of the Office of Science and Technology Policy shall establish an interagency committee to coordinate Federal programs in support of science and mathematics education at the elementary and secondary level.

(b) MEMBERSHIP.—The membership of the committee shall consist of the heads, or designees, of the National Science Foundation, the Department of Energy, the National Aeronautics and Space Administration, the Department of Education, and other Federal agencies that have programs directed toward support of elementary and secondary science and mathematics education.

(c) FUNCTIONS.—The committee shall—

(1) prepare a catalog of Federal research, development, demonstration, and other programs designed to improve elementary and secondary science or mathematics education, including for each program a summary of goals and the kinds of activities supported, a summary of accomplishments (including evidence of effectiveness in improving student learning), the funding level, and, for grant programs, the eligibility requirements and the selection process for awards;

(2) review the programs identified under paragraph (1) in order to—

(A) determine the relative funding levels for—

(i) teacher professional development;

(ii) curricular materials;

(iii) improved classroom teaching practices;

(iv) applications of computers and related information technologies; and

(v) other major categories of activities;

(B) assess whether the balance among funding of activities as determined under subparagraph (A) is appropriate and whether unnecessary duplication or overlap among programs exists;

(C) assess the degree to which the programs assist the efforts of State and local school systems to implement standards-based reform of science and mathematics education, and group the programs in categories of high, moderate, and low relevance for assisting standards-based reform;

(D) for grant programs, identify ways to simplify application procedures and requirements and to achieve greater conformity among the procedures and requirements of the applicable agencies; and

(E) evaluate the adequacy of the assessment procedures used by the agencies to deter-

mine whether the goals and objectives of programs are being achieved, and identify the best practices identified from the evaluation for assessment of program effectiveness; and

(3) monitor the implementation of the plan developed under section 403 and provide to the Director of the Office of Science and Technology Policy its findings and recommendations for modifications to that plan.

SEC. 402. EXTERNAL REVIEW.

The Director shall enter into an agreement with the National Research Council to conduct an independent review of programs as described in section 401(c)(2) and to develop findings and recommendations. The findings and recommendations from the National Research Council review of programs shall be reported to the Director of the Office of Science and Technology Policy and to Congress.

SEC. 403. EDUCATION PLAN.

(a) PLAN CONTENTS.—On the basis of the findings of the review carried out in accordance with section 401(c)(2) and taking into consideration the findings and recommendations of the National Research Council in accordance with section 402, the Director of the Office of Science and Technology Policy shall prepare a plan for

Federal elementary and secondary science and mathematics education programs which shall include—

(1) a strategy to increase the effectiveness of Federal programs to assist the efforts of State and local school systems to implement standards-based reform of elementary and secondary science and mathematics education;

(2) a coordinated approach for identifying best practices for the use of computers and related information technologies in classroom instruction;

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

(4) identification of effective Federal programs that have made measurable contributions to achieving standards-based science and mathematics education reform;

(5) recommendations to departments and agencies for actions needed to increase uniformity across the Federal Government for application procedures and requirements for grant awards for support of elementary and secondary science and mathematics education; and

(6) dissemination procedures for replicating results from effective programs, particularly best practices for classroom instruction.

(b) CONSULTATION.—The Director shall consult with academic, State, industry, and other appropriate entities engaged in efforts to reform science and mathematics education as necessary and appropriate for preparing the plan under subsection (a).

SEC. 404. SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY BUSINESS EDUCATION CONFERENCE.

(a) IN GENERAL.—Not later than 180 days after the date of the enactment of this Act, the Director shall convene the first of an annual 3- to 5-day conference for kindergarten through the 12th grade science, mathematics, engineering, and technology education stakeholders, including—

(1) representatives from Federal, State, and local governments, private industries, private businesses, and professional organizations;

(2) educators;

(3) science, mathematics, engineering, and technology educational resource providers;

(4) students; and

(5) any other stakeholders the Director determines would provide useful participation in the conference.

(b) PURPOSES.—The purposes of the conference convened under subsection (a) shall be to—

(1) identify and gather information on existing science, mathematics, engineering, and technology education programs and resource providers, including information on distribution, partners, cost assessment, and derivation;

(2) determine the extent of any existing coordination between providers of curricular activities, initiatives, and units; and

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

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

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

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

SEC. 405. REPORTS.

(a) INITIAL COORDINATION REPORT.—The Director of the Office of Science and Technology Policy shall sub-

mit to Congress, not later than 1 year after the date of the enactment of this Act, a report which—

(1) includes the plan described in section 403(a);

(2) in accordance with section 403(a)(3), describes, for each agency represented on the committee established under section 401(a), appropriate levels of Federal funding;

(3) includes the catalog prepared under section 401(c)(1);

(4) includes the findings from the review required under section 401(c)(2);

(5) includes the findings and recommendations of the National Research Council developed under section 402; and

(6) describes the procedures used by each agency represented on the committee to assess the effectiveness of its education programs.

(b) ANNUAL UPDATES.—The Director of the Office of Science and Technology Policy shall submit to Congress an annual update, at the time of the submission of the President's annual budget request, of the report submitted under subsection (a), which shall include, for each agency represented on the committee, appropriate levels of Federal funding for the fiscal year during which the report

is submitted and the levels proposed for the fiscal year for which the budget submission applies.

(c) CONFERENCE REPORT AND PUBLICATION.—At the conclusion of the conference required under section 404, the Director shall—

(1) transmit to the Committee on Science of the House of Representatives and to the Committee on Commerce, Science, and Transportation of the Senate a report on the outcome and conclusions of the conference, including an inventory of curricular activities, initiatives, and units, the content of the conference, and strategies developed that will support partnerships and leverage resources; and

(2) ensure that a similar report is published and distributed as widely as possible to stakeholders in science, mathematics, engineering, and technology education.

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