106TH CONGRESS
2D SESSION

S. 2624

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

IN THE SENATE OF THE UNITED STATES

MAY 24, 2000

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

---

A BILL

To establish and expand programs relating to science, mathematics, engineering, 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 ''National Science Education Act''.

SEC. 2. FINDINGS.

Congress finds the following:

(1) As concluded in the report of the Committee on Science of the House of Representatives,

"Unlocking Our Future Toward a New National Science Policy," which was adopted by the House of Representatives, the United States must maintain and improve its preeminent position in science and technology in order to advance human understanding of the universe and all it contains, and to improve the lives, health, and freedoms of all people.

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

(3) The effectiveness of the United States in maintaining this economic growth will be largely determined by the intellectual capital of the United States. Education is critical to developing this resource.

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

(5) Student performance on the recent Third International Math and Science Study highlights the shortcomings of current K–12 science and mathematics education in the United States, particularly when compared to other countries. We must expect more from our Nation's educators and students if we are to build on the accomplishments of previous generations. New methods of teaching mathematics

and science are required, as well as better curricula and improved training of teachers.

(6) Science is more than a collection of facts, theories, and results. It is a process of inquiry built upon observations and data that leads to a way of knowing and explaining in logically derived concepts and theories.

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

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

(9) Teachers provide the essential connection between students and the content they are learning. High-quality prospective teachers need to be identified and recruited by presenting to them a career that is respected by their peers, is financially and intellectually rewarding, and contains sufficient opportunities for advancement.

(10) Teachers need to have incentives to remain in the classroom and improve their practice, and training of teachers is essential if the results are to

be good. Teachers need to be knowledgeable of their content area, of their curriculum, of up-to-date research in teaching and learning, and of techniques that can be used to connect that information to their students in their classroom.

SEC. 3. ASSURANCE OF CONTINUED LOCAL CONTROL.

Nothing in this Act may be construed to authorize any department, agency, officer, or employee of the United States to exercise any direction, supervision, or control over the curriculum, program of instruction, administration, or personnel of any educational institution or school system.

SEC. 4. MASTER TEACHER GRANT PROGRAM.

The National Science Foundation Act of 1950 (42 U.S.C. 1861 et seq.) is amended—

(1) by redesignating section 16 as section 18; and

(2) by inserting after section 15 the following new section:

"§ 16. Grants and awards

''(a)(1) The Director of the National Science Foundation shall conduct a grant program to make grants to a State or local educational agency or to a private elementary or middle school for the purpose of hiring a master teacher described in paragraph (3).

''(2) In order to be eligible to receive a grant under this subsection, a State or local educational agency or private elementary or middle school shall submit to the Director a description of the requirements for a master teacher of the State or local educational agency or school, including certification requirements and job responsibilities of the master teacher, and a description of how professional development will be integrated with the math or science program of the State educational agency or local educational agency or school including a master teacher.

''(3) A master teacher referred to in paragraph (1)—

''(A) shall provide support for not more than 10 teachers at public and private schools in math, science, engineering or technology programs for students in grades kindergarten through the eighth grade; and

''(B) shall be responsible for in-classroom assistance and oversight of hands-on inquiry materials, equipment, and supplies, including supplying and repairing such materials.

''(4) Grants shall be made under this section out of funds available for the National Science Foundation for Education and Human Resources Activities.

''(b) In this section, the terms 'State educational agency' and 'local educational agency' have the meaning

given those terms in section 14101 of the Elementary and Secondary Education Act of 1965.''.

SEC. 5. HIGH-QUALITY EDUCATIONAL SOFTWARE FOR ALL SCHOOLS.

The National Science Foundation Act of 1950 (42 U.S.C. 1861 et seq.) is further amended in section 16 (as added by section 4) by adding at the end the following new subsection:

''(c)(1) The Director is authorized to award grants, on a competitive basis, to secondary school and college students working with university faculty, software developers, and experts in educational technology, or to university faculty, software developers, and experts in educational technology working with secondary school or college students, for the development of high-quality educational software and Internet web sites by such students, faculty, developers, and experts.

''(2)(A) The Director shall recognize outstanding educational software and Internet web sites developed with assistance provided under this subsection.

''(B) The President is requested to, and the Director shall, issue an official certificate signed by the President and Director, to each student and faculty member who develops outstanding educational software or Internet web sites recognized under this subsection.

''(3) The educational software or Internet web sites that are recognized under this subsection shall focus on core curriculum areas.

''(4) The Director shall give priority to awarding grants for the development of educational software or Internet web sites in the areas of mathematics, science, engineering, and technology.

''(5) The Director shall designate official judges to recognize outstanding educational software or Internet web sites assisted under this section.''.

SEC. 6. ESTABLISHMENT OF WORKING GROUP ON SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY EDUCATION.

The National Science Foundation Act of 1950 (42 U.S.C. 1861 et seq.) is further amended by inserting after section 16 (as added by section 4) the following new section:

''§ 17. Establishment of working group on science, mathematics, engineering, and technology education

''(a) There is established in the National Science Foundation a working group to review and coordinate regular and supplemental curricula in kindergarten through the twelfth grade for science, mathematics, engineering, and technology, taking into account—

''(1) the content, scope, and sequence of such curricula;

''(2) the research basis for such curricula; and

''(3) the demonstrated results of such curricula.

''(b) There shall be 15 members of the working group established by subsection (a), who shall have experience in the fields of life science, physical science, earth science, chemistry, technology, math, or engineering, and who shall be appointed by the Director for a three-year term that may be extended once for an additional three years. The members shall be appointed as follows:

''(1) 4 members appointed from among representatives from appropriate professional societies representing the scientific disciplines.

''(2) 3 members appointed from among business leaders who are active in education.

''(3) 2 members appointed from among representatives of institutions of higher education.

''(4) 2 members appointed from among representatives of schools of education within such institutions.

''(5) 4 members appointed from among representatives of professional societies that represent science teaching.

''(c)(1) The working group established by subsection (a)—

''(A) shall, beginning not later than three years after the date of the enactment of this Act, award recognition annually in predetermined categories;

''(B) shall publish all criteria upon which a review by the working group under this section is based; and

''(C) shall disseminate information on award-winning programs for the purpose of acting as a resource for State and local educational agencies—

''(i) for determining the best methods for teachers to present science, mathematics, engineering, and technology subject areas to students; and

''(ii) for organizing science, mathematics, engineering, and technology disciplines.

''(2) The information required to be disseminated by paragraph (1)(C) shall include information describing the activities of the award-winning programs and the awards made in each category.''.

SEC. 7. DEMONSTRATION PROGRAM AUTHORIZED.

(a) GENERAL AUTHORITY.—

(1) IN GENERAL.—

(A) GRANT PROGRAM.—The Director shall, subject to appropriations, carry out 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 an information technology program that builds or expands mathematics, science, and information technology curricula, to purchase equipment necessary to establish such program, and to provide professional development in such fields.

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

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

(B) provide students with specialized training in mathematics, science, and information technology.

(b) ELIGIBLE LOCAL EDUCATIONAL AGENCY.—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 (c); and

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

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

(1) the donation of computer hardware and software;

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

(3) the donation of higher education scholarship funds for eligible students who have participated in the information technology program.

(d) APPLICATION.—

(1) IN GENERAL.—Each eligible local educational agency desiring a grant under this section 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 subsection (a)(1)(B) and (a)(2);

(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 in accordance with subsection (e) and on

the basis of merit to be determined after conducting a comprehensive review.

(e) 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 (c);

(2) demonstrate the greatest economic need; and

(3) use a curriculum recognized by the working group established by section 17 of the National Science Foundation Act of 1950 (as added by section 6).

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

(g) STUDY AND REPORT.—The Director—

(1) shall initiate an evaluative study of eligible students selected for scholarships pursuant to this section in order to measure the effectiveness of the demonstration program; 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.

(h) DEFINITIONS.—Except as otherwise provided, for purposes of this section—

(1) the term ''Director'' means the Director of the National Science Foundation;

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

(A) has participated in 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 3.0 on a 4.0 scale for the last 2 years of secondary school (11th and 12th grades); and

(3) the term ''local educational agency'' has the same meaning given such term in section 14101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801).

(i) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation to carry out this section, $3,000,000.

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

SEC. 8. DISSEMINATION OF INFORMATION ON REQUIRED COURSE OF STUDY FOR CAREERS IN SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY EDUCATION.

The Director of the National Science Foundation shall, jointly with the Secretary of Education, compile and disseminate information (including, but not limited to, through outreach, school counselor education, and visiting speakers) regarding—

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

(2) the licensing requirements in each State for science, mathematics, engineering, or technology elementary or secondary school teachers.

SEC. 9. REQUIREMENT TO CONDUCT STUDY EVALUATION.

(a) STUDY REQUIRED.—The Director of the National Science Foundation shall enter into an agreement with the National Academy of Sciences under which the Academy shall compile and evaluate studies on the effectiveness of technology in the classroom on learning and student performance, as measured by State standardized tests. The study evaluation shall include, to the extent available, information on the type of technology used in each classroom, the reason that such technology works, and the teacher training that is conducted in conjunction with the technology.

(b) DEADLINE FOR COMPLETION.—The study evaluation required by subsection (a) shall be completed not later than 180 days after the date of the enactment of this Act.

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

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation $600,000 for the purpose of conducting the study evaluation required by subsection (a).

SEC. 10. TEACHER TECHNOLOGY PROFESSIONAL DEVELOPMENT.

The National Science Foundation Act of 1950 (42 U.S.C. 1861 et seq.) is further amended in section 16 (as added by section 4) by adding at the end the following new subsection:

''(d) The Director shall establish a grant program under which grants may be made for instruction of teachers for grades kindergarten through the twelfth grade on the use of technology in the classroom.''.

SEC. 11. MIDDLE SCHOOL COMPUTER LITERACY ASSISTANCE.

The National Science Foundation Act of 1950 (42 U.S.C. 1861 et seq.) is further amended in section 16 (as added by section 4) by adding at the end the following new subsection:

''(e)(1) The Director is authorized to award grants to assist States in reaching the goal of making all middle school graduates in the State technology literate.

''(2) Grants awarded under this subsection shall be used for teacher training in technology, with an emphasis on programs that prepare 1 or more teachers in each middle school in the State to become technology leaders who then serve as experts and train other teachers.

''(3) Each State shall encourage schools that receive assistance under this subsection to provide matching

funds, with respect to the cost of teacher training in technology to be assisted under this subsection, in order to enhance the impact of the teacher training and to help ensure that all middle school graduates in the State are computer literate.''.

SEC. 12. SCIENCE, MATHEMATICS, ENGINEERING, AND TECHNOLOGY EDUCATION CONFERENCE.

(a) IN GENERAL.—Within 180 days after the date of the enactment of this Act, the Director of the National Science Foundation shall convene a conference of representatives from Federal, State, and local governments, private industries, professional organizations, educators, science, mathematics, engineering, and technology educational resource providers, students, and any other stakeholders the Director decides would provide useful participation in the conference. Such conference shall be known as the National Science Education Forum.

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

(1) identify existing science, mathematics, engineering, and technology education programs and resource providers;

(2) examine how well existing programs are coordinated and how much collaboration exists among them;

(3) examine the common goals and differences among the participants at the conference; and

(4) develop strategies that will support partnerships and leverage resources.

(c) REPORT AND PUBLICATION.—At the conclusion of the conference the Director of the National Science Foundation 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; and

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

SEC. 13. GRANTS FOR DISTANCE LEARNING.

The National Science Foundation Act of 1950 (42 U.S.C. 1861 et seq.) is further amended in section 16 (as added by section 4) by adding at the end the following new subsection:

''(f) The Director may make grants to a State or local educational agency or to a private elementary, middle, or secondary school, under any grant program administered by the Director using funds appropriated for the National

Science Foundation for Education and Human Resources Activities, for activities in which distance learning is integrated into the education process in grades kindergarten through the twelfth grade.''.

SEC. 14. AVAILABILITY OF CURRICULAR PROGRAMS THROUGH THE INTERNET.

The Director of the National Science Foundation shall make available through the Internet at no cost a complete field-test version (including text and graphics) of any curricular program, the development for which the National Science Foundation provided funds.

SEC. 15. SCHOLARSHIPS TO PARTICIPATE IN CERTAIN RESEARCH ACTIVITIES.

(a) IN GENERAL.—The President, acting through the National Science Foundation, shall provide scholarships to teachers at public and private schools in grades kindergarten through the twelfth grade in order that such teachers may participate in research programs conducted at private entities or Federal or State Government agencies. The purpose of such scholarships shall be to provide teachers with an opportunity to expand their knowledge of science and research techniques and encourage incorporation of such techniques into the classroom.

(b) REQUIREMENTS.—In order to be eligible to receive a scholarship under this section, a teacher described

in subsection (a) shall be required to develop, in conjunction with the private entity or Government agency at which the teacher will be participating in a research program, a proposal to be submitted to the President describing the types of research activities involved, and how techniques with respect to such research may be incorporated into the educational process.

(c) PERIOD OF PROGRAM.—Participation in a research program in accordance with this section may be for a period of one academic year or 2 sequential summers.

(d) INTERNET SITE.—The Director of the National Science Foundation shall establish an Internet web site which may be used by students and teachers participating in the program under this section to incorporate research knowledge and techniques into the educational process.

○