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109TH CONGRESS
2D SESSION

H. R. 5358

To authorize programs relating to science, mathematics, engineering, and technology education at the National Science Foundation and the Department of Energy Office of Science, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 11, 2006

Mr. SCHWARZ of Michigan (for himself, Mr. BOEHLERT, Mr. SMITH of Texas, Mr. CALVERT, Mr. EHLERS, Mrs. BIGGERT, Mr. INGLIS of South Carolina, and Mr. MCCAUL of Texas) introduced the following bill; which was referred to the Committee on Science

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A BILL

To authorize programs relating to science, mathematics, engineering, and technology education at the National Science Foundation and the Department of Energy Office of Science, 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 and Mathematics Education for Competitiveness Act''.

SEC. 2. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM.

Section 10 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1) is amended—

(1) by inserting ''Teacher'' after ''Noyce'' in the section heading and each place it appears in the text;

(2) in subsection (c)(3)—

(A) by striking ''$7,500'' and inserting ''$10,000''; and

(B) by striking ''of scholarship support'' and inserting ''of scholarship support, unless the Director establishes a policy by which part-time students may receive additional years of support'';

(3) in subsection (c)(4), by inserting ''with a maximum service requirement of 4 years'' after ''was received'';

(4) in subsection (d)(3), by striking ''1 year'' and inserting ''16 months'';

(5) in subsection (d)(4), by striking ''for each year a stipend was received'';

(6) in subsection (g)(2)(A)—

(A) by striking ''Treasurer of the United States,'' and inserting ''Treasurer of the United States.''; and

(B) by striking ''multiplied by 2.''

(7) in subsection (i)(3), by inserting ''or had a career in'' after ''is working in''; and

(8) by adding at the end the following:

''(j) AUTHORIZATION OF APPROPRIATIONS.—Except as provided in subsection (k), there are authorized to be appropriated to the Director for the Robert Noyce Teacher Scholarship Program—

''(1) $50,000,000 for fiscal year 2007, of which at least $7,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

''(2) $70,000,000 for fiscal year 2008, of which at least $10,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

''(3) $90,000,000 for fiscal year 2009, of which at least $13,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii);

''(4) $90,000,000 for fiscal year 2010, of which at least $13,500,000 shall be used for capacity

building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii); and

''(5) $90,000,000 for fiscal year 2011, of which at least $13,500,000 shall be used for capacity building activities described in subsection (a)(3)(A)(ii) and (iii) and (B)(ii) and (iii).

''(k) EXCEPTION.—For any fiscal year for which the funding allocated for activities under this section is less than $50,000,000, the amount of funding available for capacity building activities described in paragraphs (1) through (5) of subsection (j) shall not exceed 15 percent of the allocated funds.''

SEC. 3. SCIENCE AND MATHEMATICS TEACHER TRAINING PARTNERSHIPS.

(a) IN GENERAL.—Section 9 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n) is amended to read as follows:

''SEC. 9. SCIENCE AND MATHEMATICS TEACHER TRAINING PARTNERSHIPS PROGRAM.

''(a) PROGRAM AUTHORIZED.—

''(1) IN GENERAL.—(A) The Director shall carry out a program to award grants to institutions of higher education or eligible nonprofit organizations (or consortia of such institutions or organizations) to establish science and mathematics teacher

training partnership programs to improve elementary and secondary science and mathematics instruction.

''(B) Grants shall be awarded under this subsection on a competitive, merit-reviewed basis.

''(2) PARTNERSHIPS.—To be eligible to receive a grant under this subsection, an institution of higher education through 1 or more of its departments in science, mathematics, or engineering or an eligible nonprofit organization (or a consortium thereof) shall enter into a partnership with 1 or more local educational agencies that may also include 1 or more businesses.

''(3) REQUIRED USES OF FUNDS.—Grants awarded under this subsection shall be used for activities that draw upon the expertise of the partners to improve teacher content knowledge in science or mathematics at the elementary or secondary levels, such as conducting—

''(A) intensive, content-specific teacher institutes, which may include the provision of stipends or expenses for participants;

''(B) model induction programs for teachers in their first 2 years of teaching; and

''(C) programs to expand the knowledge of existing teachers through sustained, content-specific professional development programs.

''(4) ADDITIONAL USES OF FUNDS.—Grants awarded under this subsection may also be used to conduct—

''(A) programs to train, in both content and pedagogy, teacher leaders who will be granted sufficient nonclassroom time to serve as mentor teachers, as demonstrated by assurances their employing school has provided to the Director, in such time and such manner as the Director may require;

''(B) programs to train teachers to incorporate new technologies into their classroom; and

''(C) programs to train teachers to incorporate laboratory experiences into their lesson plans.

''(b) SELECTION PROCESS.—

''(1) APPLICATION.—An institution of higher education or eligible nonprofit organization seeking funding under subsection (a) shall submit an application to the Director at such time, in such manner, and containing such information as the Director

may require. The application shall include, at a minimum—

"(A) a description of the partnership and the role that each member will play in implementing the proposal;

"(B) a description of the activities to be carried out, including—

"(i) the number of teachers to be served;

"(ii) how such activities will be aligned with State science and mathematics achievement standards;

"(iii) how such activities will increase the number or percentage of science and mathematics teachers who are highly qualified teachers, as defined in section 9101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801); and

"(iv) how such activities will reduce the attrition of science and mathematics teachers;

"(C) a description of the need for qualified science and mathematics teachers in the area to be served;

''(D) a description of the manner in which the partnership will be continued after assistance under this program concludes; and

''(E) a description of how the partnership will evaluate the impact of the program.

''(2) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under paragraph (1), the Director shall consider, at a minimum—

''(A) the ability of the partners to effectively carry out the proposed programs;

''(B) the extent to which effective practices can be identified and replicated; and

''(C) the extent to which the evaluation described in paragraph (1)(E) will be independent and based on objective measures.

''(3) AWARDS.—In awarding grants under this section, the Director shall give priority consideration to applications in which the partnership includes a high-need local educational agency and to applications that include activities described in subsection (a)(4)(A).

''(4) MAXIMUM GRANT.—A grant awarded under this section shall not be less than $75,000 or greater than $2,000,000 for any fiscal year.

''(c) ACCOUNTABILITY AND DISSEMINATION.—

''(1) ASSESSMENT REQUIRED.—Not later than 2 years after the date of enactment of this section, the Director shall establish a common set of benchmarks and assessment tools to allow for the comparison of practices across grantees.

''(2) REPORT.—Not later than 4 years after the date of enactment of this section, the Director shall perform an assessment of the effectiveness of the Science and Mathematics Teacher Training Partnerships Program established by this section in improving elementary and secondary science and mathematics instruction. Not later than 5 years after the date of enactment of this section, the Director shall transmit a report describing the results of this assessment to the Committee on Science and the Committee on Education and the Workforce of the House of Representatives and to the Committee on Commerce, Science, and Transportation and the Committee on Health, Education, Labor, and Pensions of the Senate. Such reports shall be made widely available to the public.

''(d) AUTHORIZATION.—There are authorized to be appropriated to the National Science Foundation for the purpose of this section $50,000,000 for each of the fiscal years 2007 through 2011.''.

(b) DEFINITIONS.—Section 4 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n note) is amended—

(1) by amending paragraph (6) to read as follows:

''(6) ELIGIBLE NONPROFIT ORGANIZATION.—The term 'eligible nonprofit organization' means a nonprofit organization, such as a museum or science center, involved in the preparation, training, or certification of science and mathematics teachers.'';

(2) by amending paragraph (8) to read as follows:

''(8) HIGH-NEED LOCAL EDUCATIONAL AGENCY.—The term 'high-need local educational agency' means a local educational agency that—

''(A) is receiving grants under title I of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq) as a result of having within its jurisdiction concentrations of children from low income families; and

''(B) is experiencing a shortage of highly qualified teachers, as defined in section 9101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801), in the fields of science, mathematics, or engineering.''; and

(3) in paragraph (11) by striking ''master teacher'' and inserting ''teacher leader'' each place it appears.

(c) CONTINUING GRANTS.—This section shall not be construed to terminate any Mathematics and Science Partnership awards made prior to the date of enactment of this Act.

SEC. 4. SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS TALENT EXPANSION PROGRAM.

There are authorized to be appropriated to the Director of the National Science Foundation for the Science, Technology, Engineering, and Mathematics Talent Expansion Program, $40,000,000 for fiscal year 2007, $45,000,000 for fiscal year 2008, $50,000,000 for fiscal year 2009, $50,000,000 for fiscal year 2010, and $50,000,000 for fiscal year 2011.

SEC. 5. INTEGRATIVE GRADUATE EDUCATION AND RESEARCH TRAINEESHIP PROGRAM.

(a) FUNDING.—For each of the fiscal years 2007 through 2011, the Director of the National Science Foundation shall allocate at least 1.5 percent of funds appropriated for Research and Related Activities to the Integrative Graduate Education and Research Traineeship program.

(b) COORDINATION.—The Director shall coordinate with Federal departments and agencies, as appropriate, to expand the interdisciplinary nature of the Integrative Graduate Education and Research Traineeship program.

(c) AUTHORITY TO ACCEPT FUNDS FROM OTHER AGENCIES.—The Director is authorized to accept funds from other Federal departments and agencies to carry out the Integrative Graduate Education and Research Traineeship program.

SEC. 6. ESTABLISHMENT OF CENTERS FOR UNDERGRADUATE EDUCATION IN SCIENCE, MATHEMATICS, AND ENGINEERING.

(a) ESTABLISHMENT.—

(1) IN GENERAL.—(A) The Director of the National Science Foundation shall carry out a program to award grants to departments of science, mathematics, or engineering at institutions of higher education (or consortia thereof) to establish Centers for Undergraduate Education in Science, Mathematics, and Engineering. The program shall be designed to promote the development of curriculum, teaching methods, and teacher training methods to improve the quality of undergraduate science, mathematics, and engineering courses and increase the number of students taking such courses, including nonmajors.

(B) The grants shall be made jointly through the Education and Human Resources Directorate and at least 1 research directorate of the National Science Foundation.

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

(D) Grants awarded under this section shall be for 5 years. The Director may extend a grant under this section for up to 2 additional 3-year periods.

(2) ACTIVITIES.—Grants awarded under this section may be used to—

(A) create model curricula and laboratory programs;

(B) develop and demonstrate research-based instructional methods and technologies;

(C) develop methods to train graduate students and faculty to be more effective teachers;

(D) conduct programs to disseminate curricula, instructional methods, or training methods to faculty at the grantee institutions and at other institutions; and

(E) conduct any other activities the Director determines will accomplish the goals described in paragraph (1)(A).

(b) SELECTION PROCESS.—

(1) APPLICATION.—A department of science, mathematics, or engineering of an institution of higher education (or consortium thereof) seeking funding under this section shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. At a minimum, the application shall include—

(A) a description of the activities to be carried out by the Center;

(B) a plan for disseminating programs related to the activities carried out by the Center to faculty at the grantee institution and at other institutions;

(C) an estimate of the number of faculty, graduate students, and undergraduate students who be affected by the activities carried out by the Center; and

(D) a plan for assessing the effectiveness of the Center at accomplishing the goals described in subsection (a)(1)(A).

(2) REVIEW OF APPLICATIONS.—In evaluating the applications submitted under paragraph (1), the Director shall consider, at a minimum—

(A) the ability of the applicant to effectively carry out the proposed activities, including the dissemination activities described in subsection (a)(2)(D); and

(B) the extent to which the faculty, staff, and administrators of the applicant institution are committed to improving undergraduate science, mathematics, and engineering education.

(3) AWARDS.—In awarding grants under the program, the Director shall endeavor to ensure that a wide variety of science, mathematics, and engineering fields and types of institutions of higher education, including 2-year colleges, are covered, and that—

(A) at least 1 center is housed at a Doctoral/Research University as defined by the Carnegie Foundation for the Advancement of Teaching; and

(B) at least 1 center is focused on improving undergraduate education in an interdisciplinary area.

(c) ANNUAL CONFERENCE.—The Director shall convene an annual meeting of the Centers to foster collabora-

tion among the Centers and to further disseminate the results of the Centers' activities.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation for the purpose of this section $4,000,000 for fiscal year 2007 and $10,000,000 for each of the fiscal years 2008 through 2011.

SEC. 7. EVALUATION OF PROFESSIONAL SCIENCE MASTERS.

Not earlier than 1 year after the date of enactment of this Act, the Director of the National Science Foundation shall enter into an agreement with an appropriate party to assess the impact of the Professional Science Master's (PSM) degree at a variety of institutions, including the extent to which the degree is interdisciplinary and targeted to emerging fields, the ability of graduates to obtain employment in industry relative to those who receive traditional science master's degrees, salary ranges for graduates relative to traditional science masters graduates, the extent to which the degree is terminal or graduates go on to continue their education, and the success of the degree in attracting traditionally underrepresented populations, including women and minorities. The results of such study, together with any recommendations for Federal support for Professional Science Master's pro-

grams, shall be submitted to the Congress not later than 3 years after the date of enactment of this Act.

SEC. 8. REPORT ON BROADER IMPACTS CRITERION.

Not later than 1 year after the date of enactment of this Act, the Director of the National Science Foundation shall submit to Congress a report on the impact of the broader impacts grant criterion used by the National Science Foundation. The report shall——

(1) identify the criteria that each division and directorate of the Foundation uses to evaluate the broader impacts aspects of research proposals;

(2) provide a breakdown of the types of activities by division that awardees have proposed to carry out to meet the broader impacts criterion;

(3) provide any evaluations performed by the National Science Foundation to assess the degree to which the broader impacts aspects of research proposals were carried out and how effective they have been at meeting the goals described in the research proposals;

(4) describe what national goals, such as improving undergraduate science, mathematics, and engineering education, improving K-12 science and mathematics education, promoting university-industry collaboration and technology transfer, and broad-

ening participation of underrepresented groups, the broader impacts criterion is best suited to promote; and

(5) describe what steps the National Science Foundation is taking and should take to use the broader impacts criterion to improve undergraduate science, mathematics, and engineering education.

SEC. 9. EDUCATION PROGRAMS AT THE DEPARTMENT OF ENERGY.

(a) AUTHORIZATION OF EDUCATION PROGRAMS.—The Secretary of Energy shall carry out education programs and activities in fields related to the Department's mission, which may include awarding scholarships or fellowships for study and research, providing research experiences at National Laboratories for undergraduates, and operating summer institutes to improve the content knowledge of science and mathematics teachers.

(b) INVENTORY AND EVALUATION.—

(1) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary of Energy shall transmit a report to the Congress which shall contain—

(A) an inventory of existing education programs and activities at the Department and at the National Laboratories, which shall include a

description of each education program or activity supported by the Department or the National Laboratories, a description of the intended beneficiaries, and the amount of Federal funding used to support it; and

(B) a schedule for conducting independent evaluations of the education programs and activities identified under subparagraph (A) to assess the impact of such programs and activities on the intended beneficiaries and the larger mission of the Department that shall result in all evaluations of the programs being completed not later than 4 years after the date of enactment of this Act.

(2) IMPLEMENTATION OF SCHEDULE.—The Secretary shall implement the schedule provided under paragraph (1)(B) and shall transmit each evaluation to the Congress as it is completed, along with a description of any actions the Secretary intends to take as a result of the evaluation.

(c) NATIONAL LABORATORIES.—The Secretary shall include the conduct of education programs at the National Laboratories and the results of any evaluations of such programs as a factor in the annual setting of the perform-

ance and other incentive fees for a National Laboratories management and operations contractor.

SEC. 10. DEFINITION.

In this Act, the term ''institution of higher education'' has the meaning given such term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

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