IB

Union Calendar No. 420

115TH CONGRESS
2D SESSION

H. R. 3397

[Report No. 115–558]

To direct the National Science Foundation to support STEM education research focused on early childhood.

IN THE HOUSE OF REPRESENTATIVES

JULY 25, 2017

Ms. ROSEN (for herself, Mr. KNIGHT, Mr. EVANS, Mr. MEEKS, Mr. TONKO, Ms. HANABUSA, Mr. BEYER, Ms. ESTY of Connecticut, Mr. CRIST, Ms. SLAUGHTER, and Mr. SOTO) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

FEBRUARY 13, 2018

Additional sponsors: Ms. BORDALLO, Mr. RYAN of Ohio, Mr. TAKANO, Mr. LIPINSKI, Mr. PETERS, Ms. NORTON, Miss RICE of New York, Mrs. MURPHY of Florida, Ms. SINEMA, Mr. PERLMUTTER, Mr. FOSTER, Mr. TED LIEU of California, Mr. KHANNA, Ms. LOFGREN, Ms. JACKSON LEE, Ms. ESHOO, Mr. QUIGLEY, Mr. LARSEN of Washington, Mr. BERA, Ms. JAYAPAL, and Mr. FASO

FEBRUARY 13, 2018

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in italic]

[For text of introduced bill, see copy of bill as introduced on July 25, 2017]

A BILL

To direct the National Science Foundation to support STEM education research focused on early childhood.

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 "Building Blocks of STEM Act".

SEC. 2. FINDINGS.

The Congress finds the following:

(1) The National Science Foundation has made the largest financial investment in STEM education of all Federal agencies, and plays a very powerful role in helping to set research and policy agendas.

(2) Studies have found that children who engage in scientific activities from an early age develop positive attitudes toward science and are more likely to pursue STEM expertise and careers later on.

(3) However, the majority of current research focuses on increasing STEM opportunities for students in middle school and older.

(4) Women remain widely underrepresented in the STEM workforce and this gender disparity extends down through all levels of education. Strategic funding of programs is needed in order to understand and address the root cause of this gap.

SEC. 3. DEFINITIONS.

In this Act:

(1) DIRECTOR.—The term "Director" means the Director of the National Science Foundation.

(2) EARLY CHILDHOOD.—The term "early childhood" applies to children from birth through the age of 10.

(3) INSTITUTION OF HIGHER EDUCATION.—The term "institution of higher education" has the meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(4) LOCAL EDUCATIONAL AGENCY.—The term "local educational agency" has the meaning given the term in section 8101 of the Elementary and Secondary Education Act of 1965 (20 USC 7801), except that such term also includes preschools, after-school programs, and summer programs.

(5) STEM.—The term "STEM" has the meaning given the term in section 2 of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. 6621 note).

(6) YOUNG GIRLS.—The term "young girls" means female individuals who have not attained the age of 11.

SEC. 4. SUPPORTING STEM RESEARCH ON EARLY CHILDHOOD.

In awarding grants under the Discovery Research PreK–12 program, the Director shall consider age distribution in order to more equitably allocate funding for research studies with a focus on early childhood.

SEC. 5. SUPPORTING GIRLS IN STEM EDUCATION AND COMPUTER SCIENCE.

(a) RESEARCH GRANTS.—

(1) IN GENERAL.—The Director shall award grants, on a competitive basis, to institutions of higher education or nonprofit organizations (or consortia of such institutions or organizations), to accelerate research efforts to increase understanding of the factors that contribute to the participation of young girls in STEM activities.

(2) RESEARCH AREAS.—Research areas funded by a grant under this subsection may include—

(A) the role of teacher training and professional development, including effective incentive structures to encourage teachers to participate in such training and professional development, in encouraging or discouraging young girls from participating in STEM activities;

(B) the role of teachers in shaping young girls' perceptions of STEM and discouraging

such girls from participating in STEM activities;

(C) the role of other facets of the learning environment on the willingness of young girls to participate in STEM activities, including learning materials and textbooks, classroom decorations, seating arrangements, use of media and technology, classroom culture, and gender composition of students during group work;

(D) the role of parents and other caregivers in encouraging or discouraging young girls from participating in STEM activities;

(E) the types of STEM activities that elicit greater participation by young girls;

(F) the role of mentorship and best practices in finding and utilizing mentors;

(G) the role of informal and out-of-school STEM learning opportunities on girls' perception of and participation in STEM activities; and

(H) any other activity the Director determines will accomplish the goals of this subsection.

(3) GRANT RECIPIENT REPORT.—An entity awarded a grant under this subsection shall report to

the Director, at such time and in such manner as the Director may require, on the activities carried out and materials developed using such grant funds.

(b) DEVELOPMENT AND TESTING OF SCALABLE MODELS FOR INCREASED ENGAGEMENT.—

(1) IN GENERAL.—The Director shall award grants, on a competitive basis, to institutions of higher education or nonprofit organizations (or consortia of such institutions or organizations), to develop and evaluate interventions in pre-K and elementary school classrooms that increase participation of young girls in computer science activities.

(2) PARTNERSHIPS.—In order to be eligible to receive a grant under this subsection, an institute of higher education, nonprofit organization, or consortium, shall enter into a partnership with one or more local educational agency or State in carrying out the activities funded by such grant.

(3) USES OF FUNDS.—Grants awarded under this subsection shall be used for activities that draw upon the expertise of the partner entities described in paragraph (2) to increase participation of young girls in computer science activities, including—

(A) offering training and professional development programs, including summer or aca-

demic year institutes or workshops, designed to strengthen the capabilities of pre-K and elementary school teachers and to familiarize such teachers with the role of gender bias in the classroom;

(B) offering innovative preservice and in-service programs that instruct teachers on gender-inclusive practices for teaching computing concepts;

(C) developing distance learning programs for teachers or students, including developing curricular materials, play-based computing activities, and other resources for the in-service professional development of teachers that are made available to teachers through the Internet;

(D) developing a cadre of master teachers who will promote reform and the adoption of gender-inclusive practices in teaching computer science concepts in early childhood education;

(E) developing tools to evaluate activities conducted under this subsection;

(F) developing or adapting pre-K and elementary school computer science curricular materials that incorporate contemporary research

on the science of learning, particularly with respect to gender inclusion;

(G) developing and offering gender-inclusive computer science enrichment programs for students, including after-school and summer programs;

(H) providing mentors for girls in person and through the Internet to support such girls in participating in computer science activities;

(I) engaging parents of girls about the difficulties faced by girls to maintain an interest and desire to participate in computer science activities, and enlisting the help of parents in overcoming these difficulties;

(J) acquainting girls with careers in computer science and encouraging girls to consider careers in such field; and

(K) any other activities the Director determines will accomplish the goals of this subsection.

(4) GRANT RECIPIENT REPORT.—An entity awarded a grant under this subsection shall report to the Director, at such time and in such manner as the Director may require, on the activities carried out,

materials developed using such grant funds, and the outcomes for students served by such grant.

(5) EVALUATION REQUIRED.—Not later than 4 years after the date of enactment of this Act, the Director shall evaluate the grant program under this subsection. At a minimum, such evaluation shall—

(A) use a common set of benchmarks and assessment tools to identify best practices and materials developed and demonstrated by the partnerships described in paragraph (2); and

(B) to the extent practicable, compare the effectiveness of practices and materials developed and demonstrated by such partnerships with those of partnerships funded by other local or State government or Federal Government programs.

(6) DISSEMINATION OF RESULTS.—

(A) EVALUATION RESULTS.—The Director shall make publicly available free of charge on an Internet website and shall submit to Congress the results of the evaluation required under paragraph (5).

(B) MATERIALS.—The Director shall ensure that materials developed under a program funded by a grant under this subsection, that are

demonstrated to be effective in achieving the goals of this subsection (as determined by the Director), are made publicly available free of charge on an Internet website, including through an arrangement with an outside entity.

(7) ANNUAL MEETING.—The Director may convene an annual meeting of the partnerships participating in a program funded by a grant under this subsection, for the purpose of fostering greater national collaboration.

(8) TECHNICAL ASSISTANCE.—At the request of a partnership seeking a grant under this subsection, the Director shall provide the partnership with technical assistance in meeting any requirement of this subsection.

SEC. 6. COMPUTER SCIENCE IN THE 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 striking "and mathematics" each place it appears and inserting "mathematics, informatics, and computer science";

(2) in subsection (a)(3)(B), by striking "or mathematics" and inserting "mathematics, informatics, and computer science";

(3) in subsections (b)(1)(D)(i), (c)(1)(A), (d)(1), and (i)(7), by striking "or mathematics" each place it appears and inserting "mathematics, informatics, or computer science"; and

(4) in subsection (i)(5), by striking "or mathematics" and inserting "mathematics, or computer science".

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