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1ST SESSION

H. R. 730

IN THE SENATE OF THE UNITED STATES

MARCH 25, 2025

Received; read twice and referred to the Committee on Health, Education,
Labor, and Pensions

AN ACT

To coordinate Federal research and development efforts focused on modernizing mathematics in STEM education through mathematical and statistical modeling, including data-driven and computational thinking, problem, project, and performance-based learning and assessment, interdisciplinary exploration, and career connections, and for other purposes.

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

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Mathematical and Sta-
5 tistical Modeling Education Act”.

6 **SEC. 2. MATHEMATICAL AND STATISTICAL MODELING EDU-**
7 **CATION.**

8 (a) FINDINGS.—Congress finds the following:

9 (1) The mathematics taught in schools, includ-
10 ing statistical problem solving and data science, is
11 not keeping pace with the rapidly evolving needs of
12 the public and private sector, resulting in a STEM
13 skills shortage and employers needing to expend re-
14 sources to train and upskill employees.

15 (2) According to the Bureau of Labor Statis-
16 tics, the United States will need 1,000,000 addi-
17 tional STEM professionals than it is on track to
18 produce in the coming decade.

19 (3) The field of data science, which is relevant
20 in almost every workplace, relies on the ability to
21 work in teams and use computational tools to do
22 mathematical and statistical problem solving.

23 (4) Many STEM occupations offer higher
24 wages, more opportunities for advancement, and a
25 higher degree of job security than non-STEM jobs.

1 (5) The STEM workforce relies on computa-
2 tional and data-driven discovery, decision making,
3 and predictions, from models that often must quan-
4 tify uncertainty, as in weather predictions, spread of
5 disease, or financial forecasting.

6 (6) Most fields, including analytics, science, eco-
7 nomics, publishing, marketing, actuarial science, op-
8 erations research, engineering, and medicine, require
9 data savvy, including the ability to select reliable
10 sources of data, identify and remove errors in data,
11 recognize and quantify uncertainty in data, visualize
12 and analyze data, and use data to develop under-
13 standing or make predictions.

14 (7) Rapidly emerging fields, such as artificial
15 intelligence, machine learning, quantum computing
16 and quantum information, all rely on mathematical
17 and statistical concepts, which are critical to prove
18 under what circumstances an algorithm or experi-
19 ment will work and when it will fail.

20 (8) Military academies have a long tradition in
21 teaching mathematical modeling and would benefit
22 from the ability to recruit students with this exper-
23 tise from their other school experiences.

24 (9) Mathematical modeling has been a strong
25 educational priority globally, especially in China,

1 where participation in United States mathematical
2 modeling challenges in high school and higher edu-
3 cation is orders of magnitude higher than in the
4 United States, and Chinese teams are taking a ma-
5 jority of the prizes.

6 (10) Girls participate in mathematical modeling
7 challenges at all levels at similar levels as boys, while
8 in traditional mathematical competitions girls par-
9 ticipate less and drop out at every stage. Students
10 cite opportunity for teamwork, using mathematics
11 and statistics in meaningful contexts, ability to use
12 computation, and emphasis on communication as
13 reasons for continued participation in modeling chal-
14 lenges.

15 (b) DEFINITIONS.—In this section:

16 (1) DIRECTOR.—The term “Director” means
17 the Director of the National Science Foundation.

18 (2) FEDERAL LABORATORY.—The term “Fed-
19 eral laboratory” has the meaning given such term in
20 section 4 of the Stevenson-Wydler Technology Inno-
21 vation Act of 1980 (15 U.S.C. 3703).

22 (3) FOUNDATION.—The term “Foundation”
23 means the National Science Foundation.

24 (4) INSTITUTION OF HIGHER EDUCATION.—The
25 term “institution of higher education” has the

1 meaning given such term in section 101(a) of the
2 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

3 (5) MATHEMATICAL MODELING.—The term
4 “mathematical modeling” has the meaning given
5 such term in the 2019 Guidelines to Assessment and
6 Instruction in Mathematical Modeling Education
7 (GAIMME) report, 2nd edition.

8 (6) OPERATIONS RESEARCH.—The term “oper-
9 ations research” means the application of scientific
10 methods to the management and administration of
11 organized military, governmental, commercial, and
12 industrial processes to maximize operational effi-
13 ciency.

14 (7) STATISTICAL MODELING.—The term “sta-
15 tistical modeling” has the meaning given such term
16 in the 2021 Guidelines to Assessment and Instruc-
17 tion in Statistical Education (GAISE II) report.

18 (8) STEM.—The term “STEM” means the
19 academic and professional disciplines of science,
20 technology, engineering, and mathematics, including
21 computer science.

22 (c) PREPARING EDUCATORS TO ENGAGE STUDENTS
23 IN MATHEMATICAL AND STATISTICAL MODELING.—The
24 Director shall make awards on a merit-reviewed, competi-
25 tive basis to institutions of higher education and nonprofit

1 organizations (or a consortium thereof) for research and
2 development to advance innovative approaches to support
3 and sustain high-quality mathematical modeling education
4 in schools that are operated by local educational agencies,
5 including statistical modeling, data science, operations re-
6 search, and computational thinking. The Director shall en-
7 courage applicants to form partnerships to address critical
8 transitions, such as middle school to high school, high
9 school to college, and school to internships and jobs.

10 (d) APPLICATION.—An entity seeking an award
11 under subsection (c) shall submit an application at such
12 time, in such manner, and containing such information as
13 the Director may require. The application shall include the
14 following:

15 (1) A description of the target population to be
16 served by the research activity for which such an
17 award is sought, including student subgroups de-
18 scribed in section 1111(b)(2)(B)(xi) of the Elemen-
19 tary and Secondary Education Act of 1965 (20
20 U.S.C. 6311(b)(2)(B)(xi)), and students experi-
21 encing homelessness and children and youth in fos-
22 ter care.

23 (2) A description of the process for recruitment
24 and selection of students, educators, or local edu-

1 cational agencies to participate in such research ac-
2 tivity.

3 (3) A description of how such research activity
4 may inform efforts to promote the engagement and
5 achievement of students, including students from
6 groups historically underrepresented in STEM, in
7 prekindergarten through grade 12 in mathematical
8 modeling and statistical modeling using problem-
9 based learning with contextualized data and com-
10 computational tools.

11 (4) In the case of a proposal consisting of a
12 partnership or partnerships with one or more local
13 educational agencies and one or more researchers, a
14 plan for establishing a sustained partnership that is
15 jointly developed and managed, draws from the ca-
16 pacities of each partner, and is mutually beneficial.

17 (e) PARTNERSHIPS.—In making awards under sub-
18 section (c), the Director shall encourage applications that
19 include the following:

20 (1) Partnership with a nonprofit organization
21 or an institution of higher education that has exten-
22 sive experience and expertise in increasing the par-
23 ticipation of students in prekindergarten through
24 grade 12 in mathematical modeling and statistical
25 modeling.

1 (2) Partnership with a local educational agency,
2 a consortium of local educational agencies, or Tribal
3 educational agencies.

4 (3) An assurance from school leaders to making
5 reforms and activities proposed by the applicant a
6 priority.

7 (4) Ways to address critical transitions, such as
8 middle school to high school, high school to college,
9 and school to internships and jobs.

10 (5) Input from education researchers and cog-
11 nitive scientists, as well as practitioners in research
12 and industry, so that what is being taught is up-to-
13 date in terms of content and pedagogy.

14 (6) A communications strategy for early con-
15 versations with parents, school leaders, school
16 boards, community members, employers, and other
17 stakeholders.

18 (7) Resources for parents, school leaders, school
19 boards, community members, and other stakeholders
20 to build skills in modeling and analytics.

21 (f) USE OF FUNDS.—An entity that receives an
22 award under this section shall use the award for research
23 and development activities to advance innovative ap-
24 proaches to support and sustain high-quality mathe-
25 matical modeling education in public schools, including

1 statistical modeling, data science, operations research, and
2 computational thinking, which may include the following:

3 (1) Engaging prekindergarten through grade 12
4 educators in professional learning opportunities to
5 enhance mathematical modeling and statistical prob-
6 lem solving knowledge, and developing training and
7 best practices to provide more interdisciplinary
8 learning opportunities.

9 (2) Conducting research on curricula and teach-
10 ing practices that empower students to choose the
11 mathematical, statistical, computational, and techno-
12 logical tools they will apply to a problem, as is re-
13 quired in life and the workplace, rather than pre-
14 scribing a particular approach or method.

15 (3) Providing students with opportunities to ex-
16 plore and analyze real data sets from contexts that
17 are meaningful to the students, which may include
18 the following:

19 (A) Missing or incorrect values.

20 (B) Quantities of data that require choice
21 and use of appropriate technology.

22 (C) Multiple data sets that require choices
23 about which data are relevant to the current
24 problem.

1 (D) Data of various types including quan-
2 tities, words, and images.

3 (4) Taking a school or district-wide approach to
4 professional development in mathematical modeling
5 and statistical modeling.

6 (5) Engaging rural local agencies.

7 (6) Supporting research on effective mathe-
8 matical modeling and statistical modeling teaching
9 practices, including problem- and project-based
10 learning, universal design for accessibility, and ru-
11 brics and mastery-based grading practices to assess
12 student performance.

13 (7) Designing and developing pre-service and
14 in-service training resources to assist educators in
15 adopting transdisciplinary teaching practices within
16 mathematics and statistics courses.

17 (8) Coordinating with local partners to adapt
18 mathematics and statistics teaching practices to le-
19 verage local natural, business, industry, and commu-
20 nity assets in order to support community-based
21 learning.

22 (9) Providing hands-on training and research
23 opportunities for mathematics and statistics edu-
24 cators at Federal laboratories, institutions of higher
25 education, or in industry.

1 (10) Developing mechanisms for partnerships
2 between educators and employers to help educators
3 and students make connections between their mathe-
4 matics and statistics projects and topics of relevance
5 in today's world.

6 (11) Designing and implementing professional
7 development courses and experiences, including men-
8 toring for educators, that combine face-to-face and
9 online experiences.

10 (12) Reducing gaps in access to learning oppor-
11 tunities for students from groups historically under-
12 represented in STEM.

13 (13) Providing support and resources for stu-
14 dents from groups historically underrepresented in
15 STEM.

16 (14) Addressing critical transitions, such as
17 middle school to high school, high school to college,
18 and school to internships and jobs.

19 (15) Researching effective approaches for en-
20 gaging students from groups historically underrep-
21 resented in STEM.

22 (16) Any other activity the Director determines
23 will accomplish the goals of this section.

24 (g) EVALUATIONS.—All proposals for awards under
25 this section shall include an evaluation plan that includes

1 the use of outcome oriented measures to assess the impact
2 and efficacy of the award. Each recipient of an award
3 under this section shall include results from such evalua-
4 tive activities in annual and final project reports.

5 (h) ACCOUNTABILITY AND DISSEMINATION.—

6 (1) EVALUATION REQUIRED.—The Director
7 shall evaluate the portfolio of awards made under
8 this section. Such evaluation shall—

9 (A) use a common set of benchmarks and
10 tools to assess the results of research conducted
11 under such awards and identify best practices;
12 and

13 (B) to the extent practicable, integrate the
14 findings of research resulting from the activities
15 funded through such awards with the findings
16 of other research on student's pursuit of de-
17 grees or careers in STEM.

18 (2) REPORT ON EVALUATIONS.—Not later than
19 180 days after the completion of the evaluation
20 under paragraph (1), the Director shall submit to
21 Congress and make widely available to the public a
22 report that includes the following:

23 (A) The results of the evaluation.

24 (B) Any recommendations for administra-
25 tive and legislative action that could optimize

1 the effectiveness of the awards made under this
2 section.

3 (i) FUNDING.—\$10,000,000 for each of the fiscal
4 years 2026 through 2030 is authorized to be used by the
5 Directorate for STEM Education of the National Science
6 Foundation to carry out this section.

7 **SEC. 3. NASEM REPORT ON MATHEMATICAL AND STATIS-**
8 **TICAL MODELING EDUCATION IN PRE-**
9 **KINDERGARTEN THROUGH 12TH GRADE.**

10 (a) STUDY.—Not later than 180 days after the date
11 of the enactment of this Act, the Director of the National
12 Science Foundation (in this section referred to as the “Di-
13 rector”) shall seek to enter into an agreement with the
14 National Academies of Sciences, Engineering and Medi-
15 cine (in this section referred to as “NASEM”) (or if
16 NASEM declines to enter into such an agreement, another
17 appropriate entity) under which NASEM, or such other
18 appropriate entity, agrees to conduct a study on the fol-
19 lowing:

20 (1) Factors that enhance or barriers to the im-
21 plementation of mathematical modeling and statis-
22 tical modeling in elementary and secondary edu-
23 cation, including opportunities for and barriers to
24 use modeling to integrate mathematical and statis-

1 tical ideas across the curriculum, including the fol-
2 lowing:

3 (A) Pathways in mathematical modeling
4 and statistical problem solving from kinder-
5 garten to the workplace so students are able to
6 identify opportunities to use their school mathe-
7 matics and statistics in a variety of jobs and
8 life situations and so employers can benefit
9 from students' school learning of data science,
10 computational thinking, mathematics, statistics,
11 and related subjects.

12 (B) The role of community-based prob-
13 lems, service-based learning, and internships for
14 connecting students with career preparatory ex-
15periences.

16 (C) Best practices in problem-, project-,
17 performance-based learning and assessment.

18 (2) Characteristics of teacher education pro-
19 grams that successfully prepare teachers to engage
20 students in mathematical modeling and statistical
21 modeling, as well as gaps and suggestions for build-
22 ing capacity in the pre-service and in-service teacher
23 workforce.

24 (3) Mechanisms for communication with stake-
25 holders, including parents, administrators, and the

1 public, to promote understanding and knowledge of
2 the value of mathematical modeling and statistical
3 modeling in education.

4 (b) PUBLIC STAKEHOLDER MEETING.—In the course
5 of completing the study described in subsection (a),
6 NASEM or such other appropriate entity shall hold not
7 fewer than one public meeting to obtain stakeholder input
8 on the topics of such study.

9 (c) REPORT.—The agreement under subsection (a)
10 shall require NASEM, or such other appropriate entity,
11 not later than 24 months after the effective date of such
12 agreement, to submit to the Director, the Secretary of
13 Education, and the Congress a report containing the fol-
14 lowing:

15 (1) The results of the study conducted under
16 subsection (a).

17 (2) Recommendations to modernize the proc-
18 esses described in subsection (a)(1).

19 (3) Recommendations for such legislative and
20 administrative action as NASEM, or such other ap-
21 propriate entity, determines appropriate.

22 (d) FUNDING.—\$1,000,000 for each of the fiscal
23 years 2026 through 2030 is authorized to be used by the
24 Directorate for STEM Education of the National Science
25 Foundation to carry out this section.

1 **SEC. 4. LIMITATIONS.**

2 (a) LIMITATION ON FUNDING.—Amounts made avail-
3 able to carry out sections 2 and 3 shall be derived from
4 amounts appropriated or otherwise made available to the
5 National Science Foundation.

6 (b) SUNSET.—The authority to provide awards under
7 this Act shall expire on September 30, 2029.

Passed the House of Representatives March 24,
2025.

Attest: KEVIN F. MCCUMBER,
Clerk.