118TH CONGRESS
2D SESSION

S. _____

To support National Science Foundation education and professional development relating to artificial intelligence.

IN THE SENATE OF THE UNITED STATES

Ms. CANTWELL (for herself and Mr. MORAN) introduced the following bill; which was read twice and referred to the Committee on _____

A BILL

To support National Science Foundation education and professional development relating to artificial intelligence.

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 ''NSF AI Education Act of 2024''.

SEC. 2. DEFINITIONS.

In this Act:

(1) ARTIFICIAL INTELLIGENCE; AI.—The term ''artificial intelligence'' or ''AI'' has the meaning given such term in section 5002 of the William M.

(Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (15 U.S.C. 9401).

(2) COMMUNITY COLLEGE.—The term ''community college'' has the meaning given the term ''junior or community college'' in section 312(f) of the Higher Education Act of 1965 (20 U.S.C. 1058(f)).

(3) DIRECTOR.—The term ''Director'' means the Director of the National Science Foundation.

(4) EMERGING RESEARCH INSTITUTION.—The term ''emerging research institution'' has the meaning given the term in section 10002 of the Research and Development, Competition, and Innovation Act (42 U.S.C. 18901).

(5) EPSCoR INSTITUTION.—The term ''EPSCoR institution'' means an institution of higher education, nonprofit organization, or other institution located in a jurisdiction eligible to participate in the Established Program to Stimulate Competitive Research under section 113 of the National Science Foundation Authorization Act of 1988 (42 U.S.C. 1862g).

(6) HIGH SCHOOL.—The term ''high school'' has the meaning given that term in section 8101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7801).

(7) HISTORICALLY BLACK COLLEGE AND UNIVERSITY.—The term ''historically Black college and university'' has the meaning given the term ''part B institution'' in section 322 of the Higher Education Act of 1965 (20 U.S.C. 1061).

(8) 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)).

(9) KEY EMERGING TECHNOLOGIES.—The term ''key emerging technologies'' means the technologies included in the initial list of key technology focus areas set forth by section 10387(c) of the Research and Development, Competition, and Innovation Act (42 U.S.C. 19107(c)), photonics, and electronics.

(10) LABOR ORGANIZATION.—The term ''labor organization'' has the meaning given the term in section 2(5) of the National Labor Relations Act (29 U.S.C. 152(5)), except that such term shall also include—

(A) any organization composed of labor organizations, such as a labor union federation or a State or municipal labor body; and

(B) any organization that would be included in the definition for such term under

such section 2(5) but for the fact that the organization represents—

(i) individuals employed by the United States, any wholly owned Government corporation, any Federal Reserve Bank, or any State or political subdivision thereof;

(ii) individuals employed by persons subject to the Railway Labor Act (45 U.S.C. 151 et seq.); or

(iii) individuals employed as agricultural laborers.

(11) MINORITY-SERVING INSTITUTION.—The term ''minority-serving institution'' has the meaning given the term in section 10002 of the Research and Development, Competition, and Innovation Act (42 U.S.C. 18901).

(12) NATIONAL LABORATORY.—The term ''National Laboratory'' has the meaning given that term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(13) NONPROFIT ORGANIZATION.—The term ''nonprofit organization'' means an organization which is described in section 501(c)(3) of the Internal Revenue Code of 1986 and exempt from tax under section 501(a) of such Code.

(14) QUANTUM HYBRID COMPUTING.—The term ''quantum hybrid computing'' means the use of quantum computing in conjunction with classical computing.

(15) QUANTUM INFORMATION SCIENCE.—The term ''quantum information science'' means the use of the laws of quantum physics for the storage, transmission, manipulation, computing, or measurement of information.

(16) RURAL-LOCATED INSTITUTION OF HIGHER EDUCATION.—The term ''rural-located institution of higher education'' means an institution of higher education that is located in or near areas that are not classified as urban by the Census Bureau.

(17) RURAL-SERVING INSTITUTION OF HIGHER EDUCATION.—The term ''rural-serving institution of higher education'' means an institution of higher education that—

(A) primarily serves areas that are not classified as urban by the Census Bureau; and

(B) offers degrees that are unique and helpful to rural regions that are not classified as urban by the Census Bureau.

(18) STEM.—The term ''STEM'' means science, technology, engineering, and mathematics, including computer science.

(19) TRIBAL COLLEGE OR UNIVERSITY.—The term ''Tribal College or University'' has the meaning given the term in section 316(b) of the Higher Education Act of 1965 (20 U.S.C. 1059c(b)).

SEC. 3. UNDERGRADUATE SCHOLARSHIPS FOR ARTIFICIAL INTELLIGENCE EDUCATION.

(a) SCHOLARSHIPS RELATED TO AI OR QUANTUM HYBRID COMPUTING.—

(1) IN GENERAL.—The Director shall award merit- or need-based scholarships to undergraduate students at institutions of higher education in order to enable such students to study—

(A) the development, deployment, integration, or application of artificial intelligence; or

(B) quantum hybrid computing.

(2) SCHOLARSHIPS.—Scholarships awarded under paragraph (1) shall be in the form of annual grant awards for a 4-year period in amounts that cover the cost of tuition, education-related fees, and a stipend. Such scholarships shall be paid directly to the institution of higher education in which the student is enrolled.

(b) SCHOLARSHIPS RELATED TO AI AND AGRICULTURE.—

(1) IN GENERAL.—The Director shall award merit- or need-based scholarships to undergraduate students at institutions of higher education in order to enable such students to study—

(A) artificial intelligence and agriculture; or

(B) the integration of artificial intelligence into agricultural operations, prediction, and decisionmaking.

(2) PRIORITY.—In awarding scholarships under this subsection, the Director shall give preference to students who are attending rural-located institutions of higher education, rural-serving institutions of higher education, or Tribal Colleges or Universities.

(3) SCHOLARSHIPS.—Scholarships awarded under paragraph (1) shall be in the form of annual grant awards for a 4-year period in amounts that cover the cost of tuition, education-related fees, and a stipend. Such scholarships shall be paid directly to the institution of higher education in which the student is enrolled.

(c) SCHOLARSHIPS RELATED TO AI AND EDUCATION.—

(1) IN GENERAL.—The Director shall award merit- or need-based scholarships to undergraduate students at institutions of higher education in order to enable such students to study the teaching of artificial intelligence and artificial intelligence skills at elementary schools, secondary schools, career and technical education schools, institutions of higher education, or through other higher education and professional education programs.

(2) SCHOLARSHIPS.—Scholarships awarded under paragraph (1) shall be in the form of annual grant awards for a 4-year period that cover the cost of tuition, education-related fees, and a stipend. Such scholarships shall be paid directly to the institution of higher education in which the student is enrolled.

(d) SCHOLARSHIPS RELATED TO AI AND ADVANCED MANUFACTURING.—

(1) IN GENERAL.—The Director shall award merit- or need-based scholarships to undergraduate students at institutions of higher education in order to enable such students to study—

(A) artificial intelligence and advanced manufacturing; or

(B) the integration of artificial intelligence into advanced manufacturing operations.

(2) SCHOLARSHIPS.—Scholarships awarded under paragraph (1) shall be in the form of annual grant awards for a 4-year period that cover the cost of tuition, education-related fees, and a stipend. Such scholarships shall be paid directly to the institution of higher education in which the student is enrolled.

(e) METHOD.—The Director may carry out this section by making awards through new or existing programs.

SEC. 4. GRADUATE SCHOLARSHIPS AND FELLOWSHIPS FOR ARTIFICIAL INTELLIGENCE EDUCATION.

(a) GRADUATE SCHOLARSHIPS RELATED TO AI OR QUANTUM HYBRID COMPUTING.—The Director shall award merit- or need-based scholarships to graduate students at institutions of higher education in order to enable such students to study—

(1) the development, deployment, integration, or application of artificial intelligence; or

(2) quantum hybrid computing.

(b) SCHOLARSHIPS RELATED TO AI AND AGRICULTURE.—

(1) IN GENERAL.—The Director shall award merit- or need-based scholarships to graduate stu-

dents at institutions of higher education in order to enable such students to study—

(A) artificial intelligence and agriculture; or

(B) the integration of artificial intelligence into agricultural operations, prediction, and decisionmaking.

(2) PRIORITY.—In awarding scholarships under this subsection, the Director shall give preference to students who are attending rural-located institutions of higher education, rural-serving institutions of higher education, or Tribal Colleges or Universities.

(c) GRADUATE SCHOLARSHIPS RELATED TO AI AND EDUCATION.—The Director shall award merit- or need-based scholarships to graduate students at institutions of higher education in order to enable such students to study the teaching of artificial intelligence and artificial intelligence skills at elementary schools, secondary schools, career and technical education schools, institutions of higher education, or through other higher education and professional education programs.

(d) GRADUATE SCHOLARSHIPS RELATED TO AI AND ADVANCED MANUFACTURING.—The Director shall award merit- or need-based scholarships to graduate students at

institutions of higher education in order to enable such students to study—

(1) artificial intelligence and advanced manufacturing; or

(2) the integration of artificial intelligence into advanced manufacturing operations.

(e) SCHOLARSHIPS.—Scholarships awarded under this section shall be in the form of annual grant awards for a 3-year period that cover the cost of tuition, education-related fees, and a stipend. Such scholarships shall be paid directly to the institution of higher education in which the student is enrolled.

(f) METHOD.—The Director may carry out this section by making awards through new or existing programs.

SEC. 5. NSF ARTIFICIAL INTELLIGENCE PROFESSIONAL DEVELOPMENT FELLOWSHIPS.

(a) IN GENERAL.—The Director shall establish a program to promote the exchange of ideas and encourage collaborations between institutions of higher education and industry partners in the fields of artificial intelligence and key emerging technologies, including through fellowships for students and industry professionals.

(b) FELLOWSHIPS.—

(1) IN GENERAL.—The Director shall award merit-based fellowships for professionals for profes-

sional development programs in STEM fields or the field of education that are administered by or affiliated with institutions of higher education, in order to enable fellowship recipients to attain skills or training on—

(A) the development, deployment, integration, or application of artificial intelligence;

(B) prompt engineering; or

(C) quantum hybrid computing.

(2) FELLOWSHIP AWARDS.—Awards under this subsection shall be in the form of one annual award that covers the cost of tuition, education-related fees, and a stipend. Such awards shall be paid directly to the institution of higher education that administers, or that is affiliated with, the program in which the fellowship recipient is participating.

SEC. 6. ARTIFICIAL INTELLIGENCE TRAINING FOR LAND-GRANT COLLEGES AND UNIVERSITIES.

(a) IN GENERAL.—The Secretary of Agriculture, acting through the Director of the National Institute of Food and Agriculture, in collaboration with the Director of the National Science Foundation, shall award grants to land-grant colleges and universities (as defined in section 1404 of the National Agricultural Research, Extension, and

Teaching Policy Act of 1977 (7 U.S.C. 3103)) for artificial intelligence in agriculture.

(b) USE OF FUNDS.—A grant awarded under this section may be used for—

(1) research and development on the use of artificial intelligence in agriculture or the integration of artificial intelligence into agricultural operations, predictions, and decision making;

(2) the dissemination of educational resources for artificial intelligence in rural areas; and

(3) artificial intelligence tools for agriculture.

SEC. 7. QUANTUM FELLOWSHIPS AND SCHOLARSHIPS.

(a) IN GENERAL.—The Director may establish or use existing programs to support fellowships and scholarships for students at institutions of higher education for the purpose of—

(1) increasing quantum information science, engineering, and technology exposure for undergraduate and graduate STEM students; and

(2) increasing post-graduation employment opportunities for STEM students who demonstrate potential to pursue careers in quantum information science, engineering, and technology, or fields that support the quantum industry.

(b) REQUIREMENTS.—Eligible participants in the fellowship and scholarship program shall—

(1) be enrolled in or have graduated from a STEM degree program at a domestic institution of higher education; and

(2) have taken at least one quantum-science or quantum-relevant course as part of their degree programs.

(c) CONSIDERATIONS.—Eligible fellowships and scholarships may include temporary quantum-related positions at State or Federal agencies, National Laboratories, private sector entities, institutions of higher education, or other quantum-relevant entities, as determined appropriate by the Director.

(d) COMPETITIVE AWARDS.—Fellowships and scholarships shall be competitively awarded through a merit-review process. The Director may prioritize fellowships that include an industry partner that provides financial assistance to the applicant for direct or indirect costs.

SEC. 8. NSF OUTREACH CAMPAIGN.

(a) IN GENERAL.—The Director shall carry out a nationwide outreach campaign to students at elementary schools, secondary schools, career and technical education schools, institutions of higher education, or through other higher education and professional education programs to

increase awareness about AI or quantum education opportunities at the National Science Foundation.

(b) PRIORITY.—In carrying out such campaign, the Director shall prioritize outreach to underserved and rural areas.

SEC. 9. COMMUNITY COLLEGE AND VOCATIONAL SCHOOL CENTERS OF AI EXCELLENCE.

(a) DEFINITIONS.—In this section:

(1) AREA CAREER AND TECHNICAL EDUCATION SCHOOL.—The term ''area career and technical education school'' has the meaning given the term in section 3 of the Carl D. Perkins Career and Technical Education Act of 2006 (20 U.S.C. 2302).

(2) ELIGIBLE APPLICANT.—The term ''eligible applicant'' means a community college, vocational school, or area career and technical education school, in partnership with 1 or more of the following:

(A) A Federal, State, local, or Tribal government entity.

(B) An institution of higher education.

(C) An entity in private industry.

(D) An economic development organization or venture development organization.

(E) A labor organization.

(F) A nonprofit organization.

(3) VENTURE DEVELOPMENT ORGANIZATION.—The term ''venture development organization'' has the meaning given the term in section 27(a) of the Stevenson-Wydler Act of 1980 (15 U.S.C. 3722(a)).

(4) VOCATIONAL SCHOOL.—The term ''vocational school'' has the meaning given the term ''postsecondary vocational institution'' in section 102(c) of the Higher Education Act of 1965 (20 U.S.C. 1002(c)).

(b) ESTABLISHMENT OF CENTERS OF AI EXCELLENCE.—The Director, in coordination with the Regional Technology Hubs program at the Department of Commerce and the Regional Innovation Engines program at the National Science Foundation, shall choose not less than 5 regionally and geographically diverse eligible applicants to be designated as Community College and Vocational School Centers of AI Excellence (referred to in this section as ''Centers of AI Excellence'').

(c) EPSCoR STATE PARTICIPATION.—Not less than 20 percent of designated Community College and Vocational School Centers of AI Excellence shall be eligible applicants that are located in a State jurisdiction eligible to participate in the National Science Foundation's Established Program to Stimulate Competitive Research under

section 113 of the National Science Foundation Authorization Act of 1988 (42 U.S.C. 1862g).

(d) APPLICATION.—An eligible applicant that desires to be designated as a Center of AI Excellence shall submit an application to the Director at such time, in such manner, and containing such information as the Director may reasonably require. Such application shall specify a focus area for the Center of AI Excellence, which may be any of the following:

(1) AI education and training related to agriculture.

(2) AI education and training related to manufacturing.

(3) AI education.

(4) AI education and training related to another focus area as specified by the eligible applicant.

(e) ACTIVITIES.—A designated Center of AI Excellence shall develop and disseminate information about best practices for—

(1) artificial intelligence research and education at community colleges and area career and technical education schools;

(2) methods to scale up successful programs that perform research or provide education on artifi-

cial intelligence at community colleges and area career and technical education schools;

(3) providing hands-on research opportunities on artificial intelligence and learning opportunities for students that are enabled through artificial intelligence; and

(4) identifying pathways for students to jobs that are enabled by artificial intelligence.

SEC. 10. AWARD PROGRAM FOR RESEARCH ON AI IN EDUCATION.

(a) ELIGIBLE ENTITY.—In this section, the term ''eligible entity'' means—

(1) an institution of higher education;

(2) a nonprofit organization; or

(3) a consortium of 1 or more institution of higher education or a nonprofit organization and 1 or more private entities.

(b) PROGRAM AUTHORIZED.—

(1) IN GENERAL.—The Director shall make awards, on a competitive, merit-reviewed basis, to eligible entities, to enable the eligible entities to promote research on teaching models, tools, and materials for artificial intelligence and integration with other key emerging technologies, such as quantum information science and technologies and photonics,

with a focus on teaching and learning for kindergarten through grade 12 students who are from low-income, rural, or Tribal populations.

(2) METHOD.—The Director may carry out this section by making awards through new or existing programs.

(c) APPLICATION.—

(1) IN GENERAL.—An eligible entity that desires to receive an award 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.

(2) CONTENTS.—An application described in paragraph (1) shall include—

(A) a description of the student demographics on which the research supported under the award intends to focus;

(B) a description of any regional partnerships the eligible entity plans to utilize to carry out the award;

(C) with respect to an application that concerns the use or integration of artificial intelligence, a description of potential ethical concerns and implications of teacher and student interactions with artificial intelligence systems;

(D) a description of how the research on teaching models, tools, and materials were developed in consultation with other educators, academia, industry, and civil society organizations; and

(E) such other information as the Director may require.

(d) USE OF AWARD FUNDS.—An eligible entity that receives an award under this section shall carry out a program described in subsection (b)(1) that—

(1) emphasizes preparing incoming teachers to integrate artificial intelligence, key emerging technologies, and computational thinking into their classrooms in innovative ways; and

(2) supports research to develop, pilot, fully implement, or test areas, such as—

(A) instructional materials and high-quality learning opportunities for teaching artificial intelligence and key emerging technologies;

(B) models for the preparation of new teachers who will teach artificial intelligence and key emerging technologies;

(C) scalable models of professional development and ongoing support for teachers; and

(D) tools and models for teaching and learning aimed at supporting student success and inclusion in artificial intelligence and key emerging technologies across diverse populations, including low-income, rural, and Tribal populations.

SEC. 11. NATIONAL SCIENCE FOUNDATION AWARDS FOR ARTIFICIAL INTELLIGENCE RESOURCES.

(a) DEFINITIONS.—In this section:

(1) ELIGIBLE ENTITY.—The term ''eligible entity'' means—

(A) an elementary school or secondary school, as defined in section 8101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8101);

(B) an institution of higher education, including—

(i) an emerging research institution;

(ii) an EPSCoR institution;

(iii) a minority-serving institution;

(iv) a historically Black college or university;

(v) a Tribal College or University; or

(vi) a community college; or

(C) a technical and vocational school.

(2) TECHNICAL AND VOCATIONAL SCHOOL.—The term ''technical and vocational school'' has the meaning given the term ''area career and technical school'' in section 3 of the Carl D. Perkins Career and Technical Education Act of 2006 (20 U.S.C. 2302).

(b) AWARDS AUTHORIZED.—The Director shall make awards to eligible entities to enable the eligible entities to provide or increase access to artificial intelligence tools and applications to the students and researchers served by the eligible entities.

(c) PREFERENCE.—In making awards under subsection (b), the Director shall give preference to eligible entities that—

(1) expand the geographic diversity of funded entities; or

(2) are emerging research institutions, EPSCoR institutions, minority-serving institutions, historically Black colleges and universities, Tribal Colleges or Universities, community colleges, or technical and vocational schools.

SEC. 12. NATIONAL SCIENCE FOUNDATION NATIONAL STEM TEACHERS CORPS.

Section 10311(c)(6) of the Research and Development, Competition, and Innovation Act (42 U.S.C. 18991(c)(6)) is amended—

(1) in subparagraph (F), by striking ''and'' after the semicolon;

(2) in subparagraph (G), by striking the period at the end and inserting ''; and''; and

(3) by adding at the end the following:

''(H) incorporating artificial intelligence skills development into the priorities of the National STEM Teacher Corps, including prioritizing the development of artificial intelligence best practices for high school teachers, created in consultation with other educators and academia.''.

SEC. 13. GUIDANCE FOR THE INTRODUCTION AND USE OF ARTIFICIAL INTELLIGENCE IN PREKINDERGARTEN THROUGH GRADE 12.

(a) IN GENERAL.—Not later than 2 years after the date of enactment of this Act, the Director, in coordination with the Secretary of Education, the Director of the National Institute of Standards and Technology, and the Director of the Office of Science and Technology Policy, shall develop and make publicly available guidance for the

introduction and use of artificial intelligence in prekindergarten through grade 12 classrooms.

(b) CONSIDERATIONS.—The guidance required under subsection (a) shall include—

(1) considerations for—

(A) the use of artificial intelligence in prekindergarten through grade 12 classrooms in rural areas and economically distressed areas; and

(B) the differing applications of artificial intelligence in STEM and the liberal arts; and

(2) a description of how the guidance was developed in consultation with educators, academia, industry, and civil society organizations.

SEC. 14. NSF GRAND CHALLENGES RELATING TO ARTIFICIAL INTELLIGENCE EDUCATION AND TRAINING.

(a) GRAND CHALLENGE.—The term ''grand challenge'' means a prize competition under section 24 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3719).

(b) IN GENERAL.—The Director, in coordination with the Secretaries of Labor and Education, shall support grand challenges to stimulate innovation regarding—

(1) how to train 1,000,000 or more workers, including educators, technical and vocational workers, and professionals, in the United States by 2028 in areas related to the creation, deployment, or use of artificial intelligence, such as foundational knowledge, critical thinking, programming skills, machine learning, or deep learning;

(2) how to overcome barriers in the development of the artificial intelligence education and training;

(3) methods and strategies for creating artificial intelligence education and training that does not displace workers, including teachers, in the workforce;

(4) ways to increase the number of women who receive artificial intelligence education and training; and

(5) how to ensure rural areas of the United States are able to benefit from artificial intelligence education and training.

SEC. 15. GIFT AUTHORITY.

In carrying out this Act, the Director may receive and use funds donated by others, including receipt and use of donations from private entities to fund scholarships and fellowships authorized under this Act.