Calendar No. 198

117TH CONGRESS
1ST SESSION

S. 735

To amend the Scientific and Advanced-Technology Act of 1992 to further support advanced technological manufacturing, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MARCH 11, 2021

Mr. WICKER (for himself, Ms. CANTWELL, Ms. ROSEN, Ms. COLLINS, Mr. PETERS, and Mrs. BLACKBURN) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

DECEMBER 16, 2021

Reported by Ms. CANTWELL, with an amendment

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

A BILL

To amend the Scientific and Advanced-Technology Act of 1992 to further support advanced technological manufacturing, 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 "Advanced Technological Manufacturing Act".~~

SEC. 2. HARNESSING OUR NATION'S RESEARCH POTENTIAL.

(a) ESTABLISHMENT.—The Director of the National Science Foundation shall conduct multiple pilot programs within the Foundation to expand the number of institutions of higher education (including such institutions that are community colleges), and other eligible entities that the Director determines appropriate, that are able to successfully compete for National Science Foundation grants.

(b) COMPONENTS.—Each pilot program described in subsection (a) shall include at least 1 of the following elements:

(1) A mentorship program.

(2) Grant writing technical assistance.

(3) Targeted outreach.

(4) Programmatic support or solutions for institutions or entities that do not have an experienced grant management office.

(5) An increase in the number of grant reviewers from institutions of higher education that have not traditionally received funds from the National Science Foundation.

(6) An increase of the term and funding, for a period of 3 years or less, as appropriate, to a principal investigator that is a first-time grant awardee,

when paired with regular mentoring on the administrative aspects of grant management.

(c) LIMITATION.—As appropriate, each pilot program described in subsection (a) shall work to reduce administrative burdens.

(d) AGENCY-WIDE PROGRAMS.—Not later than 5 years after the date of enactment of this Act, the Director of the National Science Foundation shall—

(1) review the results of the pilot programs described in subsection (a); and

(2) develop agency-wide best practices from the pilot programs for implementation across the Foundation, in order to fulfill the requirement under section 3(c) of the National Science Foundation Act of 1950 (42 U.S.C. 1862(c)).

(e) INSTITUTION OF HIGHER EDUCATION.—In this section, the term ''institution of higher education'' has the meaning given the term in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001).

SEC. 3. ADVANCED SCIENTIFIC AND TECHNICAL MANUFACTURING.

(a) FINDINGS AND PURPOSE.—Section 2 of the Scientific and Advanced-Technology Act of 1992 (42 U.S.C. 1862h) is amended—

(1) in subsection (a)—

(A) in paragraph (3), by striking ''science, mathematics, and technology'' and inserting ''science, technology, engineering, and mathematics or STEM'';

(B) in paragraph (4), by inserting ''educated and'' before ''trained''; and

(C) in paragraph (5), by striking ''scientific and technical education and training'' and inserting ''STEM education and training''; and

(2) in subsection (b)—

(A) in paragraph (2), by striking ''mathematics and science'' and inserting ''STEM fields''; and

(B) in paragraph (4), by striking ''mathematics and science instruction'' and inserting ''STEM instruction''.

(b) MODERNIZING REFERENCES TO STEM.—Section 3 of the Scientific and Advanced-Technology Act of 1992 (42 U.S.C. 1862i) is amended—

(1) in the section heading, by striking ''**SCIENTIFIC AND TECHNICAL EDUCATION**'' and inserting ''**STEM EDUCATION**'';

(2) in subsection (a)—

(A) in the subsection heading, by striking ''SCIENTIFIC AND TECHNICAL EDUCATION'' and inserting ''STEM EDUCATION'';

(B) in the matter preceding paragraph (1)—

(i) by inserting ''and education to prepare the skilled technical workforce to meet workforce demands'' before '', and to improve'';

(ii) by striking ''core education courses in science and mathematics'' and inserting ''core education courses in STEM fields'';

(iii) by inserting ''veterans and individuals engaged in'' before ''work in the home''; and

(iv) by inserting ''and on building a pathway from secondary schools, to associate-degree-granting institutions, to careers that require technical training'' before '', and shall be designed'';

(C) in paragraph (1)—

(i) by inserting ''and study'' after ''development''; and

(ii) by striking ''core science and mathematics courses'' and inserting ''core STEM courses'';

(D) in paragraph (2), by striking ''science, mathematics, and advanced-technology fields'' and inserting ''STEM and advanced-technology fields'';

(E) in paragraph (3)(A), by inserting ''to support the advanced-technology industries that drive the competitiveness of the United States in the global economy'' before the semicolon at the end;

(F) in paragraph (4), by striking ''scientific and advanced-technology fields'' and inserting ''STEM and advanced-technology fields''; and

(G) in paragraph (5), by striking ''advanced scientific and technical education'' and inserting ''advanced STEM and advanced-technology'';

(3) in subsection (b)—

(A) by striking the subsection heading and inserting the following: ''CENTERS OF SCIENTIFIC AND TECHNICAL EDUCATION.—'';

(B) in the matter preceding paragraph (1), by striking ''not to exceed 10 in number'' and inserting ''in advanced-technology fields'';

(C) in paragraph (2), by striking ''education in mathematics and science'' and inserting ''STEM education''; and

(D) in the flush matter following paragraph (2), by striking ''in the geographic region served by the center'';

(4) in subsection (c)—

(A) in paragraph (1)—

(i) in subparagraph (A)—

(I) in the matter preceding clause (i), by striking ''to encourage'' and all that follows through ''such means as—'' and inserting ''to encourage the development of career and educational pathways with multiple entry and exit points leading to credentials and degrees, and to assist students pursuing pathways in STEM fields to transition from associate-degree-granting colleges to bachelor-degree-granting institutions, through such means as—'';

(II) in clause (i), by striking ''to ensure'' and inserting ''to develop articulation agreements that ensure''; and

(III) in clause (ii), by striking ''courses at the bachelor-degree-granting institution'' and inserting ''the career and educational pathways supported by the articulation agreements'';

(ii) in subparagraph (B)—

(I) in clause (i), by inserting ''veterans and individuals engaged in'' before ''work in the home'';

(II) in clause (iii)—

(aa) by striking ''bachelor's-degree-granting institutions'' and inserting ''institutions or work sites''; and

(bb) by inserting ''or industry internships'' after ''summer programs''; and

(III) by striking the flush text following clause (iv); and

(iii) by striking subparagraph (C);

(B) in paragraph (2)—

(i) by striking ''mathematics and science programs'' and inserting ''STEM programs'';

(ii) by inserting ''and, as appropriate, elementary schools,'' after ''with secondary schools'';

(iii) by striking ''mathematics and science education'' and inserting ''STEM education'';

(iv) by striking ''secondary school students'' and inserting ''students at these schools'';

(v) by striking ''science and advanced-technology fields'' and inserting ''STEM and advanced-technology fields''; and

(vi) by striking ''agreements with local educational agencies'' and inserting ''articulation agreements or dual credit courses with local secondary schools, or other means as the Director determines appropriate,''; and

(C) in paragraph (3)—

(i) by striking subparagraph (B);

(ii) by striking ''shall—'' and all that follows through ''establish a'' and inserting ''shall establish a'';

(iii) by striking ''the fields of science, technology, engineering, and mathematics'' and inserting ''STEM fields''; and

(iv) by striking ''; and'' and inserting '', including jobs at Federal and academic laboratories.'';

(5) in subsection (d)(2)—

(A) in subparagraph (D), by striking ''and'' after the semicolon;

(B) in subparagraph (E), by striking the period at the end and inserting ''; and''; and

(C) by adding at the end the following:

''(F) as appropriate, applications that apply the best practices for STEM education and technical skills education through distance learning or in a simulated work environment, as determined by research described in subsection (f).'';

(6) in subsection (g), by striking the second sentence;

(7) in subsection (h)(1)—

(A) in subparagraph (A), by striking ''2022'' and inserting ''2026'';

(B) in subparagraph (B), by striking ''2022'' and inserting ''2026''; and

(C) in subparagraph (C)—

(i) by striking ''up to $2,500,000'' and inserting ''not less than $3,000,000''; and

(ii) by striking ''2022'' and inserting ''2026''; and

(8) in subsection (j)—

(A) by striking paragraph (1) and inserting the following:

''(1) the term 'advanced-technology' includes technological fields such as advanced manufacturing, agricultural-, biological- and chemical-technologies, energy and environmental technologies, engineering technologies, information technologies, micro and nano-technologies, cybersecurity technologies, geospatial technologies, and new, emerging technology areas;'';

(B) by striking paragraph (2) and inserting the following:

''(2) the term 'associate-degree-granting college' means an institution of higher education (as defined

in section 102 of the Higher Education Act of 1965 (20 U.S.C. 1002)) that offers a 2-year associate-degree program or 2-year certificate program;'';

(C) in paragraph (3), by striking ''as determined under section 101 of the Higher Education Act of 1965'' and inserting ''as defined in section 102 of the Higher Education Act of 1965 (20 U.S.C. 1002)'';

(D) in paragraph (4), by striking ''separate bachelor-degree-granting institutions'' and inserting ''other entities'';

(E) by striking paragraph (7);

(F) by redesignating paragraphs (8) and (9) as paragraphs (7) and (8), respectively;

(G) in paragraph (7), as redesignated by subparagraph (F), by striking ''and'' after the semicolon;

(H) in paragraph (8), as redesignated by subparagraph (F)—

(i) by striking ''mathematics, science, engineering, or technology'' and inserting ''science, technology, engineering, or mathematics''; and

~~(ii) by striking ''computer science.'' and inserting ''computer science and cybersecurity; and''; and~~

~~(I) by adding at the end the following:~~

~~''(9) the term 'skilled technical workforce' means workers—~~

~~''(A) in occupations that use significant levels of science and engineering expertise and technical knowledge; and~~

~~''(B) whose level of educational attainment is less than a bachelor degree.''.~~

SECTION 1. HARNESSING OUR NATION'S RESEARCH POTENTIAL.

(a) ESTABLISHMENT.—The Director of the National Science Foundation shall conduct multiple pilot programs within the Foundation to expand the number of institutions of higher education (including such institutions that are community colleges), and other eligible entities that the Director determines appropriate, that are able to successfully compete for National Science Foundation grants.

(b) COMPONENTS.—Each pilot program described in subsection (a) shall include at least 1 of the following elements:

(1) A mentorship program.

(2) Grant writing technical assistance.

(3) Targeted outreach, including to a minority-serving institution (including a historically Black college or university, a Tribal College or University, or a Hispanic-serving institution) as described in any of paragraphs (1) through (7) of section 371(a) of the Higher Education Act of 1965 (20 U.S.C. 1067q(a)).

(4) Programmatic support or solutions for institutions or entities that do not have an experienced grant management office.

(5) An increase in the number of grant reviewers from institutions of higher education that have not traditionally received funds from the National Science Foundation.

(6) An increase of the term and funding, for a period of 3 years or less, as appropriate, to a principal investigator that is a first-time grant awardee, when paired with regular mentoring on the administrative aspects of grant management.

(c) LIMITATION.—As appropriate, each pilot program described in subsection (a) shall work to reduce administrative burdens.

(d) AGENCY-WIDE PROGRAMS.—Not later than 5 years after the date of enactment of this Act, the Director of the National Science Foundation shall—

(1) review the results of the pilot programs described in subsection (a); and

(2) develop agency-wide best practices from the pilot programs for implementation across the Foundation, in order to fulfill the requirement under section 3(e) of the National Science Foundation Act of 1950 (42 U.S.C. 1862(e)).

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

SEC. 2. ADVANCED SCIENTIFIC AND TECHNICAL MANUFACTURING.

(a) FINDINGS AND PURPOSE.—Section 2 of the Scientific and Advanced-Technology Act of 1992 (42 U.S.C. 1862h) is amended—

(1) in subsection (a)—

(A) in paragraph (3), by striking "science, mathematics, and technology" and inserting "science, technology, engineering, and mathematics or STEM";

(B) in paragraph (4), by inserting "educated and" before "trained"; and

(C) in paragraph (5), by striking "scientific and technical education and training" and inserting "STEM education and training"; and

(2) in subsection (b)—

(A) in paragraph (2), by striking "mathematics and science" and inserting "STEM fields"; and

(B) in paragraph (4), by striking "mathematics and science instruction" and inserting "STEM instruction".

(b) MODERNIZING REFERENCES TO STEM.—Section 3 of the Scientific and Advanced-Technology Act of 1992 (42 U.S.C. 1862i) is amended—

*(1) in the section heading, by striking "**SCIENTIFIC AND TECHNICAL EDUCATION**" and inserting "**STEM EDUCATION**";*

(2) in subsection (a)—

(A) in the subsection heading, by striking "SCIENTIFIC AND TECHNICAL EDUCATION" and inserting "STEM EDUCATION";

(B) in the matter preceding paragraph (1)—

(i) by inserting "and education to prepare the skilled technical workforce to meet

workforce demands'' before '', and to improve'';

(ii) by striking ''core education courses in science and mathematics'' and inserting ''core education courses in STEM fields'';

(iii) by inserting ''veterans and individuals engaged in'' before ''work in the home''; and

(iv) by inserting ''and on building a pathway from secondary schools, to associate-degree-granting institutions, to careers that require technical training'' before '', and shall be designed'';

(C) in paragraph (1)—

(i) by inserting ''and study'' after ''development''; and

(ii) by striking ''core science and mathematics courses'' and inserting ''core STEM courses'';

(D) in paragraph (2), by striking ''science, mathematics, and advanced-technology fields'' and inserting ''STEM and advanced-technology fields'';

(E) in paragraph (3)(A), by inserting ''to support the advanced-technology industries that

drive the competitiveness of the United States in the global economy" before the semicolon at the end;

(F) in paragraph (4), by striking "scientific and advanced-technology fields" and inserting "STEM and advanced-technology fields"; and

(G) in paragraph (5), by striking "advanced scientific and technical education" and inserting "advanced STEM and advanced-technology";

(3) in subsection (b)—

(A) by striking the subsection heading and inserting the following: "CENTERS OF SCIENTIFIC AND TECHNICAL EDUCATION.—";

(B) in the matter preceding paragraph (1), by striking "not to exceed 12 in number" and inserting "in advanced-technology fields";

(C) in paragraph (2), by striking "education in mathematics and science" and inserting "STEM education"; and

(D) in the flush matter following paragraph (2), by striking "in the geographic region served by the center";

(4) in subsection (c)—

(A) in paragraph (1)—

(i) in subparagraph (A)—

(I) in the matter preceding clause (i), by striking "to encourage" and all that follows through "such means as—" and inserting "to encourage the development of career and educational pathways with multiple entry and exit points leading to credentials and degrees, and to assist students pursuing pathways in STEM fields to transition from associate-degree-granting colleges to bachelor-degree-granting institutions, through such means as—";

(II) in clause (i), by striking "to ensure" and inserting "to develop articulation agreements that ensure"; and

(III) in clause (ii), by striking "courses at the bachelor-degree-granting institution" and inserting "the career and educational pathways supported by the articulation agreements";

(ii) in subparagraph (B)—

(I) in clause (i), by inserting "veterans and individuals engaged in" before "work in the home";

(II) in clause (iii)—

(aa) by striking "bachelor's-degree-granting institutions" and inserting "institutions or work sites"; and

(bb) by inserting "or industry internships" after "summer programs"; and

(III) by striking the flush text following clause (iv); and

(iii) by striking subparagraph (C);

(B) in paragraph (2)—

(i) by striking "mathematics and science programs" and inserting "STEM programs";

(ii) by inserting "and, as appropriate, elementary schools," after "with secondary schools";

(iii) by striking "mathematics and science education" and inserting "STEM education";

(iv) by striking "secondary school students" and inserting "students at these schools";

(v) by striking "science and advanced-technology fields" and inserting "STEM and advanced-technology fields"; and

(vi) by striking "agreements with local educational agencies" and inserting "articulation agreements or dual credit courses with local secondary schools, or other means as the Director determines appropriate,"; and

(C) in paragraph (3)—

(i) by striking subparagraph (B);

(ii) by striking "shall—" and all that follows through "establish a" and inserting "shall establish a";

(iii) by striking "the fields of science, technology, engineering, and mathematics" and inserting "STEM fields"; and

(iv) by striking "; and" and inserting ", including jobs at Federal and academic laboratories.";

(5) in subsection (d)(2)—

(A) in subparagraph (D), by striking "and" after the semicolon;

(B) in subparagraph (E), by striking the period at the end and inserting"; and"; and

(C) by adding at the end the following:

"(F) as appropriate, applications that apply the best practices for STEM education and technical skills education through distance learning or in a simulated work environment, as determined by research described in subsection (f).";

(6) in subsection (g), by striking the second sentence;

(7) in subsection (h)(1)—

(A) in subparagraph (A), by striking "2022" and inserting "2026";

(B) in subparagraph (B), by striking "2022" and inserting "2026"; and

(C) in subparagraph (C)—

(i) by striking "up to $2,500,000" and inserting "not less than $3,000,000"; and

(ii) by striking "2022" and inserting "2026"; and

(8) in subsection (j)—

(A) by striking paragraph (1) and inserting the following:

"(1) the term 'advanced-technology' includes technological fields such as advanced manufacturing, agricultural-, biological- and chemical-technologies, energy and environmental technologies, engineering technologies, information technologies, micro and nano-technologies, cybersecurity technologies, geospatial technologies, and new, emerging technology areas;";

(B) by striking paragraph (2) and inserting the following:

"(2) the term 'associate-degree-granting college' means an institution of higher education (as defined in section 102 of the Higher Education Act of 1965 (20 U.S.C. 1002)) that offers a 2-year associate-degree program or 2-year certificate program;";

(C) in paragraph (3), by striking "as determined under section 101 of the Higher Education Act of 1965" and inserting "as defined in section 102 of the Higher Education Act of 1965 (20 U.S.C. 1002)";

(D) in paragraph (4), by striking "separate bachelor-degree-granting institutions" and inserting "other entities";

(E) by striking paragraph (7);

(F) by redesignating paragraphs (8) and (9) as paragraphs (7) and (8), respectively;

(G) in paragraph (7), as redesignated by subparagraph (F), by striking "and" after the semicolon;

(H) in paragraph (8), as redesignated by subparagraph (F)—

(i) by striking "mathematics, science, engineering, or technology" and inserting "science, technology, engineering, or mathematics"; and

(ii) by striking "computer science and cybersecurity." and inserting "computer science and cybersecurity; and"; and

(I) by adding at the end the following:

"(9) the term 'skilled technical workforce' means workers—

"(A) in occupations that use significant levels of science and engineering expertise and technical knowledge; and

"(B) whose level of educational attainment is less than a bachelor degree.".

(c) AUTHORIZATION OF APPROPRIATIONS.—Section 5 of the Scientific and Advanced-Technology Act of 1992 (42 U.S.C. 1862j) is amended to read as follows:

"SEC. 5. AUTHORIZATION OF APPROPRIATIONS.

"There are authorized to be appropriated, from sums otherwise authorized to be appropriated, to the Director for carrying out this Act, $150,000,000 for each of fiscal years 2022 through 2027.".

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