112TH CONGRESS
1ST SESSION

S. 463

To amend part B of title II of the Elementary and Secondary Education Act of 1965 to promote effective STEM teaching and learning.

IN THE SENATE OF THE UNITED STATES

MARCH 2, 2011

Mr. BEGICH (for himself, Mr. CARPER, and Mr. LIEBERMAN) introduced the following bill; which was read twice and referred to the Committee on Health, Education, Labor, and Pensions

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A BILL

To amend part B of title II of the Elementary and Secondary Education Act of 1965 to promote effective STEM teaching and learning.

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 ''Effective STEM Teaching and Learning Act of 2011''.

SEC. 2. EFFECTIVE STEM TEACHING AND LEARNING.

(a) IN GENERAL.—Part B of title II of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6661 et seq.) is amended to read as follows:

"PART B—EFFECTIVE STEM TEACHING AND LEARNING

"SEC. 2201. PROGRAM AUTHORIZED.

''(a) PROGRAM AUTHORIZATION.—The Secretary shall use funds made available to carry out this part for a fiscal year to award grants, on a competitive basis, to State educational agencies or to State educational agencies in partnership with appropriate outside entities (such as nonprofit organizations and institutions of higher education) in States that have adopted and are implementing high-quality mathematics standards (and additional standards, such as science standards, at the discretion of the Secretary) that build toward college and career readiness, to carry out activities in order to improve the teaching and learning in—

''(1) mathematics or science, or both, in preschool through grade 12; and

''(2) at the discretion of the State educational agency, technology or engineering or both in preschool through grade 12.

''(b) LENGTH OF GRANTS.—

''(1) IN GENERAL.—Grants awarded under subsection (a) shall be for not more than 3 years.

''(2) EXTENSION.—The Secretary may extend a grant awarded under subsection (a) for an additional 2 years if the grantee—

''(A) is achieving the intended outcomes of the grant; and

''(B) shows improvement against baseline measures on performance indicators established by the Secretary.

''(c) STATE CAPACITY-BUILDING GRANTS.—

''(1) IN GENERAL.—The Secretary may reserve not more than 5 percent of the amount appropriated to carry out this part for any fiscal year to make capacity-building grants, on a competitive basis, to State educational agencies that do not otherwise receive a grant under this part.

''(2) ACTIVITIES.—A State educational agency that receives a capacity-building grant under paragraph (1) may use the grant funds to carry out 1 or more of the activities described in subsections (b) and (c) of section 2203, which may include cooperating with industry, museums, institutions of higher education, philanthropic organizations, community-based organizations, or other community partners with STEM expertise, to become more competitive for a grant under subsection (a) in future years.

''(d) DEFINITION.—In this part, the term 'STEM' means the subject or subjects in which the grantee chooses to carry out activities consistent with subsection (a).

"SEC. 2202. APPLICATION.

"(a) IN GENERAL.—Each State educational agency that desires to receive a grant under section 2201(a), shall submit an application at such time, in such manner, and containing such information as the Secretary may reasonably require. At a minimum, each application shall include or describe—

"(1) for an applicant that proposes to carry out mathematics activities, an assurance that the State has adopted high-quality mathematics standards that build toward college and career readiness, and a description of the State's plan for implementing those standards;

"(2) for an applicant that proposes to carry out science activities, an assurance that the State has adopted high-quality science standards that build toward college and career readiness, and a description of the State's plan for implementing those standards;

"(3) how the State's plan to implement standards in mathematics or science, or both, will help ensure comparability of content and access to high-quality instruction in the content area of those standards among all local educational agencies and public schools in the State, particularly in high-poverty local educational agencies and schools;

''(4) the State educational agency's goals for improving student outcomes in STEM throughout the State for all students, including students with disabilities and English language learners, and including a description of a clear and credible path that the State educational agency will take to achieve these goals with the support of the local educational agencies in the State;

''(5) the data that the State has considered or will consider in developing or updating the comprehensive preschool through grade 12 STEM plan that the State shall develop or update with the State's grant under this section, which shall include data from a needs assessment that the State has conducted prior to applying for funds under this part and that the State uses—

''(A) to determine its current approach to STEM instruction;

''(B) to support its plan, consistent with section 2201(a), to carry out activities to improve teaching and learning; and

''(C) to support struggling schools;

''(6) how the State educational agency will carry out the required State-level activities described in section 2203(b), which may include cooperating

with industry, museums, institutions of higher education, philanthropic organizations, community-based organizations, or other community partners with STEM expertise, and how the State will align those activities with the comprehensive preschool through grade 12 STEM plan that the State will develop (or update) and implement with the State's grant;

''(7) how the State educational agency will use evidence to inform and continuously improve the design and implementation of its activities and why the State educational agency expects those activities to improve student achievement, including the achievement of groups of students who are low-performing or underrepresented in STEM fields;

''(8) how the State will run a rigorous, high-quality subgrant competition, including how it will—

''(A) review and judge—

''(i) the evidence supporting the curricula and materials that local educational agencies propose to use;

''(ii) the record of local educational agencies in implementing and improving student achievement through other STEM initiatives; and

"(iii) the local educational agencies' capacity to implement successfully their proposals; and

"(B) give priority to local educational agencies whose applications are supported by the strongest available evidence;

"(9) how the State educational agency will ensure that subgrants that it awards under this part will adequately address the needs of students with disabilities and English language learners;

"(10) how the State educational agency will use the grant to leverage other Federal and State funds in order to maximize the impact of the grant, and how it will support local educational agencies in integrating these funds with other Federal, State, and local funds to support high-quality STEM instruction, including how it will implement a coherent strategy to coordinate activities with rigorous and challenging instruction for STEM career and technical education through funds the applicant receives under the Carl D. Perkins Career and Technical Education Act of 2006;

"(11) how the State educational agency will leverage the use of technology to engage students in STEM, strengthen teaching and learning of STEM,

and improve the learning opportunities in underserved areas;

''(12) how the State educational agency will evaluate the State's progress in improving achievement in the relevant STEM subject or subjects, for students, schools, or local educational agencies, particularly those that are underperforming, such as STEM-specific strategies for turning around persistently low-performing schools;

''(13) how the State educational agency will disseminate information on project outcomes in formats that are easily understood by, and accessible to, the public, and how the State educational agency will make the information useful to parents, educators, researchers, and other experts;

''(14) the role of any entities with which the State educational agency proposes to partner in carrying out its proposed activities;

''(15) if the State educational agency plans to make subgrants consistent with section 2203(d), the rationale for doing so, including a description of—

''(A) how the State educational agency will ensure the alignment of the activities undertaken by subgrantees with State standards and,

as appropriate, with the components of high-quality STEM instruction; and

''(B) the State educational agency's plan for conducting the subgrant competition, including a description of how the State educational agency will ensure either that the activities conducted by the subgrantee are evidence-based, or that the subgrantee has a plan to rigorously evaluate the effectiveness of those activities; and

''(16) if the State has received a Race to the Top grant (under the American Recovery and Reinvestment Act of 2009) and, in competing for that grant, received a competitive preference priority for STEM education, how the State educational agency will coordinate the activities it will carry out under this part with the STEM activities carried out under its Race to the Top grant.

''(b) PRIORITIES.—

''(1) REQUIRED PRIORITY.—In awarding grants under this section, the Secretary shall give a competitive priority to any State educational agency that demonstrates, in its application, that the State has adopted and is implementing a set of high-quality mathematics standards (and additional standards,

such as science standards, at the discretion of the Secretary) for kindergarten through grade 12 that build toward college and career readiness, and are common to a significant number of States.

''(2) OPTIONAL PRIORITY.—The Secretary may give a competitive priority to any State educational agency that has a robust, statewide partnership or network that brings together industry, museums, institutions of higher education, philanthropic organizations, community-based organizations, or other community partners with STEM expertise, to increase student learning, engagement, and achievement in STEM.

''(c) SELECTION CRITERIA.—In reviewing an application under this part, the Secretary shall take into consideration—

''(1) the quality of the application, including the State educational agency's plan for making publicly available findings, results (including interim results), and outcomes of the project in a timely manner and in formats that are easily understood and accessible;

''(2) the extent to which the State educational agency has demonstrated a process for giving priority to applicants that have plans that are evidence-

based or that have a plan in place to evaluate rigorously the effectiveness of their projects;

''(3) the quality of the applicant's plan to cooperate with industry experts, museums, institutions of higher education, research centers, or other community partners with STEM expertise, in—

''(A) preparing and assisting teachers in effectively integrating STEM content across grades and disciplines;

''(B) providing effective and relevant instruction; and

''(C) offering applied learning opportunities for all students; and

''(4) the quality of the applicant's plan for preparing more students for advanced study and careers in STEM, including by addressing the needs of, and barriers faced by, student groups that are underrepresented in STEM, including women and girls, underrepresented minorities, students with disabilities, and English language learners.

''SEC. 2203. STATE USE OF FUNDS.

''(a) STATE-LEVEL ACTIVITIES.—A State educational agency that receives a grant under section 2201(a) shall reserve not more than 20 percent of the

funds it receives under this part for State level activities as described in subsections (b) and (c).

''(b) REQUIRED ACTIVITIES.—A State educational agency that receives a grant under section 2201(a) shall—

''(1) develop or update, implement, and continuously improve a comprehensive State STEM plan (which may be a component or modification of the consolidated plan submitted by the State under section 9302) for preschool through grade 12 that—

''(A) aligns policies, resources, and practices;

''(B) contains clear instructional goals; and

''(C) sets high expectations for all students and student subgroups;

''(2) align the use of Federal and State funds and programs within the State educational agency and in local educational agencies in the State, including funds under title I, part A of title II, title III, and title VII, and, as appropriate, under the Individuals with Disabilities Education Act, the Carl D. Perkins Career and Technical Education Act of 2006, and the McKinney-Vento Homeless Assistance Act, to support a coherent approach to funding and implementing high-quality STEM instruction in

high-need local educational agencies and high-need schools;

''(3) develop or update a process, or use an existing process, to review and judge the evidence base for the curricula and materials that local educational agencies propose to use in implementing their subgrants and in determining whether the curricula and materials are aligned with State standards, and make the process and results of any such review publicly available;

''(4) administer a rigorous competition for subgrants that is informed by the review process described in paragraph (3), and using the results of that process to inform the competition;

''(5) collect and report, in formats that are easily understood and accessible to the public, data on the implementation and outcomes of the program, including student course enrollment and student achievement outcomes disaggregated in accordance with section 1111(b)(2)(C)(v) for use by parents, teachers, schools, local educational agencies, researchers, and State leaders for program improvement and to evaluate program effectiveness;

''(6) promote and support the implementation of effective subgrant activities in local educational

agencies and schools that do not receive, or are not served by, subgrants;

''(7) provide technical assistance and support, such as through the development or sharing of information, models, technology-based tools, or training to subgrantees (and, at the State educational agency's discretion, to other local educational agencies) to enable the subgrantees and other agencies to implement a high-quality STEM program, as described in section 2204(e), and improve student achievement in core academic subjects; and

''(8) coordinate, as needed, with other relevant State agencies (including the State agency for higher education and the State entity responsible for professional standards and licensure of teachers and principals) to—

''(A) carry out activities to improve the State's teacher licensure and certification requirements and preservice teacher preparation, by focusing on subject matter competency and reducing unnecessary barriers to entering the teaching profession while ensuring that teachers have the knowledge and skills appropriate for the grade levels the teachers teach; and

''(B) improve the State's principal licensure and certification requirements and preservice principal preparation by developing principals who are prepared to lead schools and ensure effective instruction across subject areas for a well-rounded education, including in mathematics and science.

''(c) AUTHORIZED ACTIVITIES.—A State educational agency may, either on its own or in a consortium with other State educational agencies, use any funds reserved under subsection (a) but not used for activities under subsection (b), to—

''(1) recruit and prepare individuals with STEM expertise to teach in high-need schools, including through the use of—

''(A) alternative pathways to licensure or certification programs;

''(B) recruiting STEM majors within an institution of higher education;

''(C) funding undergraduate or graduate STEM internships in preschool through grade 12 classrooms; and

''(D) funding online STEM courses and learning opportunities that provide STEM ex-

pertise across multiple locations, including areas of STEM teacher shortages;

''(2) develop instructional systems that provide—

''(A) a systematic and coherent combination of instructional materials;

''(B) embedded formative and interim assessments;

''(C) professional development;

''(D) information on student learning; and

''(E) academic interventions that are based on cognitive science and content area knowledge and that are aligned with college- and career-ready standards;

''(3) develop and implement innovative uses of technology that show promise for improving outcomes in classroom instruction, teacher and leader effectiveness, and student achievement; and

''(4) carry out activities related to any of the other subjects in section 2201(a) that the State, consistent with section 2202(a)(6), is not already carrying out under this section.

''(d) EXCEPTION.—

''(1) IN GENERAL.—The Secretary may permit a State that receives a grant under section 2201(a),

at the State's request, to use not more than 20 percent of the grant funds amount not reserved under subsection (a) to make subgrants to eligible entities (as defined under section 2204(a)(2)) under this subsection.

''(2) NOT SUBJECT TO SECTION 2204.—Subgrants awarded under this subsection shall not be subject to the requirements of section 2204, with the exception of the requirements of paragraphs (1) and (2) of section 2204(b).

''(3) APPLICATION.—In order to receive a subgrant under this subsection, an eligible entity shall submit an application to the State educational agency at such time, in such form, and including such information as the State educational agency may prescribe. At a minimum, the application shall include—

''(A) a description of the applicant's district-wide plan for developing and implementing a high-quality plan or strategy to improve STEM education and for using subgrant funds to support the implementation of that plan or strategy;

''(B) a description of the activities the entity proposes to carry out, including an expla-

nation of how those activities align with the State's STEM standards and of how they would incorporate the components of high-quality STEM instruction;

''(C) the rationale underlying the proposed model practice, strategy, or program in improving teaching practice as well as student achievement, especially with high-need student populations, which shall include either—

''(i) a description of how the proposed practice, strategy, or program is evidence-based; or

''(ii) a rationale based on research findings that the proposed practice, strategy, or program will improve student achievement; and

''(D) the plan for evaluating the impact of the model practice, strategy, or program and disseminating information from that evaluation.

''(4) ACTIVITIES.—Subgrants awarded under this subsection may carry out activities that are not required of the State under subsection (b), but that—

''(A) align with the State's STEM standards;

''(B) incorporate 1 or more of the components of high-quality STEM instruction; and

''(C) are evidence-based or for which the subgrantee has a plan in place to rigorously evaluate their effectiveness.

''SEC. 2204. STEM EDUCATION SUBGRANTS.

''(a) SUBGRANT AUTHORIZATION.—

''(1) IN GENERAL.—A State educational agency that receives a grant under section 2201(a) shall, from funds the State receives under this part that are not reserved under section 2203(a) or used pursuant to section 2203(d), make STEM education subgrants, on a competitive basis, to eligible entities.

''(2) ELIGIBLE ENTITIES.—In this section, the term 'eligible entity' means—

''(A) a high-need local educational agency;

''(B) a consortium of high-need local educational agencies;

''(C) a partnership of 1 or more high-need local educational agencies with 1 or more institutions of higher education or 1 or more nonprofit organizations, or both; or

''(D) an educational service agency proposing to serve high-need local educational agencies.

''(b) CRITERIA.—Subgrants under this section shall be—

''(1) used to carry out projects in high-need schools;

''(2) of sufficient size to support projects that can influence classroom instruction in a significant number or percentage of classrooms in the high-need schools that the subgrantee would serve; and

''(3) used to carry out the activities listed under subsection (e), unless the Secretary has permitted the State to do otherwise.

''(c) APPLICATION REQUIREMENTS.—In order to receive a subgrant under this section, an eligible entity shall submit an application to the State educational agency at such time, in such form, and including such information as the State educational agency may prescribe. At a minimum, the application shall include—

''(1) a description of the applicant's district-wide plan for developing and implementing a comprehensive high-quality STEM program for all schools and students in the participating local educational agencies and for using subgrant funds to support the implementation of that plan;

''(2) a description of how the applicant's district-wide plan aligns with the State's STEM plan

for preschool through grade 12 and the State's goals for improving student outcomes;

''(3) a description of the applicant's record in implementing and improving student achievement for all subgroups of students served through other STEM initiatives;

''(4) a description of how the proposed activities are informed by a needs assessment described in the application and designed to support effective teaching and to improve student achievement for the lowest-performing subgroups;

''(5) a description of the evidence base for the proposed activities;

''(6) a description of how the activities will include and be accessible to all students, including students with disabilities and English language learners; and

''(7) a description of how the applicant's selection of schools and the grade spans it plans to serve with funds under this part would support successful achievement of the objectives described in the application and the STEM plan required under paragraph (1).

''(d) PRIORITIES.—In awarding subgrants under this section, a State educational agency shall give priority to—

''(1) entities that propose a coherent strategy to improve STEM instruction that aligns activities under the subgrant with literacy instruction supported with other Federal funds under title I, part A of title II, title III, and title VII, and, as appropriate, the Individuals with Disabilities Education Act and the Carl D. Perkins Career and Technical Education Act of 2006 and State and local funds;

''(2) entities that propose to develop 1 or more robust partnerships with at least 1 entity, such as a locally situated business, college or university, or nonprofit organization, that has expertise, or a workforce with knowledge, in STEM fields or in education in STEM subjects;

''(3) entities that propose to implement activities in schools with the highest levels of need and capacity for improvement;

''(4) entities that have a plan for sustaining the strategy described in paragraph (1) after the end of the subgrant; and

''(5) entities whose proposals are supported by the strongest available evidence.

''(e) LOCAL ACTIVITIES.—

''(1) REQUIRED ACTIVITIES.—Each recipient of a subgrant under this section shall implement a

high-quality, evidence-based, comprehensive, and coherent STEM program that includes each of the following aligned components:

"(A) Effective professional development (as defined in section 9101) in STEM for teachers and school leaders, which may include professional development focused on subject matter competency and on ensuring that teachers have the knowledge and skills appropriate for the grade levels that they teach.

"(B) High-quality curriculum and instructional materials that are aligned with State standards and that incorporate the components of high-quality STEM instruction, and incorporate technology, as appropriate, and principles of universal design for learning to support students with diverse learning needs, including students with disabilities and English language learners.

"(C) Coherent, high-quality assessment systems that are aligned with State standards and assessments and that include—

"(i) valid and reliable diagnostic and progress-monitoring measures, to the extent available;

''(ii) the systematic use of the assessment data to inform and modify instruction, interventions, and continuous program improvement;

''(iii) appropriate accommodations necessary to ensure that all students, including students with disabilities and English language learners, are reliably and accurately assessed; and

''(iv) interventions to ensure that all students, including both struggling students and students who master the material ahead of their peers, are served appropriately.

''(D) Monitoring of program implementation and outcomes, including the effectiveness of professional development, and activities that track implementation and outcomes at the local educational agency, school, classroom, and student levels, so as to inform continuous improvement.

''(2) ADDITIONAL AUTHORIZED ACTIVITIES.—A recipient of a subgrant under this section may carry out additional activities, consistent with its plan under subsection (c)(1), including—

"(A) providing technical assistance and support to high-need schools to enable the schools to implement a high-quality, comprehensive STEM program;

"(B) developing partnerships with organizations with STEM expertise to assist the local educational agency in increasing student learning, engagement, and achievement in STEM;

"(C) creating mechanisms to promote the adoption of effective practices and ensure that those practices are sustained;

"(D) integrating evidence-based, effective STEM programs and comprehensive STEM initiatives into the teaching of other core academic subjects;

"(E) activities to support family engagement in STEM education; and

"(F) developing and implementing innovative uses of technology that show promise for improving outcomes in classroom instruction, teacher and leader effectiveness, and student achievement.

"(f) LENGTH OF GRANTS.—

"(1) IN GENERAL.—Subgrants awarded under this section shall be for not more than 3 years.

''(2) EXTENSION.—The State educational agency may extend a subgrant under this section for an additional 2 years if the subgrantee—

''(A) is achieving the intended outcomes of the subgrant; and

''(B) shows improvement against baseline measures on performance indicators established by the Secretary.''.

(b) TABLE OF CONTENTS.—The table of contents in section 2 of the Elementary and Secondary Education Act of 1965 is amended by striking the items relating to part B of title II and inserting the following:

''PART B—EFFECTIVE STEM TEACHING AND LEARNING

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