

**Testimony of the STEM Education Coalition to the
Senate Committee on Appropriations
Hearing on “Driving Innovation through Federal Investments”
April 29th, 2014**

James Brown
Executive Director
STEM Education Coalition

The STEM Education Coalition is an alliance of more than 500 education, business, and professional organizations from across the country that are united in the goal of promoting policies to improve science, technology, engineering, and mathematics (STEM) education at every level. Our Coalition closely follows the development and evolution of policies across the federal government that seek to address the challenges our nation faces in educating the future STEM workforce. A listing of the members of the Coalition’s Leadership Council, which develops and guides our public policy agenda, is included as Appendix A to this testimony.

We are pleased that the Senate Committee on Appropriations is examining issues related to innovation and science, technology, engineering, and mathematics (STEM) education at a hearing planned for later this month. As the Committee explores issues regarding federal budget and policy priorities around STEM education-related topics, we wanted to share the views of our Coalition on a number of critical policy matters.

STEM education is closely linked with our nation’s economic prosperity in the modern global economy and strong STEM skills are a central element of a well-rounded education and essential to effective citizenship and career success. Why? Here are a few reasons:

- According to the Council on Foreign Relations, 60 percent of U.S. employers are having difficulties finding qualified workers to fill vacancies at their companies.¹
- While the U.S. economy grapples with economic recovery, in the STEM occupations job postings outnumbered unemployed workers by nearly two to one.²
- At all levels of educational attainment, STEM job holders earn 11 percent higher wages compared with their same-degree counterparts in other jobs.³
- 47 percent of Bachelor’s degrees in STEM occupations earn more than PhDs in non-STEM occupations.⁴
- About 50 percent of all STEM jobs are open to workers with less than a bachelor’s degree, and about 30 percent of today’s STEM-intensive jobs are in blue collar fields.⁵

Accordingly, STEM education must be elevated as a national priority as reflected through education reforms, policies to drive innovation, and federal and state spending priorities.

¹ <http://www.cfr.org/united-states/us-education-reform-national-security/p27618>

² <http://changetheequation.org/stemdemand>

³ <http://www.nga.org/cms/home/nga-center-for-best-practices/center-publications/page-edu-publications/col2-content/main-content-list/building-a-science-technology-en-1.html>

⁴ <http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/STEMWEBINAR.pdf>

⁵ Rothwell, J. 2013. *The Hidden STEM Economy*. Washington, DC: The Brookings Institution.

Our nation must expand the capacity and diversity of the STEM workforce pipeline to prepare more students for the best jobs of the future that will keep the U.S. innovative, secure and competitive. Even more importantly, effective policies to promote STEM education as a national priority should be bipartisan and evidence-based and must be backed up by a strong and united community of stakeholders and advocates in the business, professional, research, and education communities.

We are pleased to offer a wide range of specific recommendations on STEM-related policy and budget issues, some of which we acknowledge fall outside the purview of the Appropriations Committee. Our Coalition supports:

- Inclusion of student performance in science alongside math and reading as a required element of K-12 educational accountability systems.
- Comprehensive efforts to expand the capacity and diversity of the STEM workforce pipeline, including targeted initiatives to promote the inclusion of underrepresented minorities, women, and other high-need populations in STEM fields.
- State-based efforts to implement Common Core State Standards for Mathematics and Next Generation Science Standards and other high-quality college- and career-ready standards in STEM fields.
- Robust dedicated support for effective in-depth professional development STEM educators, including informal educators.
- Robust and sustained investments in preparing and retaining new teachers at both the elementary and secondary levels to be skilled in STEM pedagogical content knowledge, including targeted efforts to promote STEM subject master teachers and teacher specialists, so that they can generate strong student learning and excite students about pursuing STEM careers.
- Comprehensive and strategic efforts to coordinate, evaluate, and review all federal STEM programs on a regular basis to ensure that effective programs are scaled up and that underperforming programs are improved or eliminated.
- Creation of a robust mechanism to solicit and include STEM education community input in decisions made by federal agencies on prioritization or reorganization of STEM education programs.
- Establishing a greater focus on STEM education activities in major education programs at the Department of Education, such as Race to the Top and Investing in Innovation, that support broad-based teaching and learning activities as well as out-of-school experiences.
- A balanced approach to the use of both formula-based and competitive funding mechanisms to promote STEM-related educational activities.

- An inclusive definition and use of the term “STEM education” by federal and state K-12 programs that is not limited to only math and science; but also embraces engineering and technology, and broadly encompasses related STEM fields such as computer science and their unique needs.
- Inclusion of informal education as a core strategy for enhancing and improving STEM education so that informal educators and programs are considered as valuable partners for STEM education improvement efforts.
- Robust and sustained investments in STEM-related educational research and innovation programs, including full funding of the National Science Foundation’s Education and Human Resources Directorate and other agency efforts to develop a rigorous education research base to inform innovations in teaching, learning, and educational materials development.
- A strong emphasis on hands-on, inquiry-based learning activities, such as learning about the engineering design process, working directly with STEM professionals through internships, and participating in field experiences and STEM-related competitions.
- Public-private partnerships and incentives that promote business and industry engagement in STEM education activities and integration and alignment of federal educational and training programs at every level with workforce needs.
- Expansion of the capacity of community colleges to prepare students for further STEM education and for the STEM workforce.
- Targeted initiatives to facilitate the transition of veterans with specialized STEM skills into higher-education programs and into careers in STEM fields.
- Using visa fees paid by U.S. employers seeking to hire foreign workers to support improvements in U.S. education programs.

As your Committee explores policies related to STEM education, we look forward to working with you and the members of the Committee to ensure that our nation advances the strongest and most robust possible federal policies to ensure our students are prepared for the global economy of the 21st century.

Appendix A: Members of the STEM Education Coalition Leadership Council

Chair: [National Science Teachers Association](#)

Co-Chairs

- [American Chemical Society](#)
- [ASME](#)
- [Education Development Center, Inc.](#)
- [Hands-On Science Partnership](#)
- [Microsoft Corporation](#)
- [National Council of Teachers of Mathematics](#)

Council Members

- [Afterschool Alliance](#)
- [American Association of Colleges for Teacher Education](#)
- [American Farm Bureau Foundation for Agriculture](#)
- [American Society for Biochemistry and Molecular Biology](#)
- [American Society for Engineering Education](#)
- [American Society of Civil Engineers](#)
- [American Statistical Association](#)
- [ASHRAE](#)
- [Association for Computing Machinery, ACM](#)
- [Association of Public and Land-grant Universities, APLU](#)
- [Battelle](#)
- [Business-Higher Education Forum](#)
- [Cable in the Classroom](#)
- [Campaign for Environmental Literacy](#)
- [Education Testing Service, ETS](#)
- [Entertainment Industries Council](#)
- [ExxonMobil](#)
- [IEEE-USA](#)
- [Illinois Math and Science Academy/Committee for the Advancement of STEM Speciality Schools](#)
- [John Wiley & Sons, Inc.](#)
- [National Association of Manufacturers](#)
- [Project Lead the Way](#)
- [RSA Conference](#)
- [Texas Instruments](#)
- [The Alliance for Science and Technology Research in America](#)
- [Time Warner Cable](#)
- [Universal Technical Institute](#)