

May 5, 2010

The Honorable Tom Harkin  
Chairman, Health, Education, Labor & Pensions Committee  
United States Senate

The Honorable Mike Enzi  
Ranking Member, Health, Education, Labor & Pensions Committee  
United States Senate

RE: Reauthorization of the Elementary & Secondary Education Act

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***Recommendations to help develop a highly skilled STEM workforce to ensure the United States' competitiveness and leadership in the global economy***

In September 2009, the National Academy of Engineering and the National Research Council released a report entitled *Engineering in K-12 Education: Understanding the Status and Improving the Prospects*. The report studied K-12 engineering curricula and instructional practices. It stressed the need for common definitions and grade-level appropriate goals, as well as more research on the impacts of engineering education and potential models for implementation.

To this end, on February 25, **Senators Gillibrand, Kaufman, Snowe, Cantwell, Klobuchar and Murray introduced S.3043, the Engineering Education for Innovation Act (E<sup>2</sup> for Innovation Act)** to further these recommendations through implementation of K-12 engineering education and related evaluation research. In general, this legislation would authorize the Secretary of Education to competitively award planning and implementation grants for educational agencies to integrate engineering education into K-12 curriculum and instruction. It also funds the research and evaluation of such efforts. Specifically, the E<sup>2</sup> for Innovation Act would:

- Integrate engineering education into K-12 instruction by designing challenging content and curricula frameworks and assessments that include engineering;
- Increase engineering and technology teacher preparation programs and recruit qualified teachers to provide engineering education in high-need schools;
- Increase student achievement in STEM subjects and knowledge and competency in engineering design skills;
- Promote aspirations for a career in engineering among diverse student populations, especially among girls and underrepresented minorities;
- Invest in afterschool engineering education programs; and
- Promote partnerships among K-12 school administrators and teachers and engineering professionals.

**Accordingly, we recommend that S.3043 be included as part of the STEM initiative under the Elementary and Secondary Education Act (ESEA) to ensure that federal K-12 education policy catalyzes the development of a highly skilled STEM workforce which will ensure our competitiveness and leadership in the global economy.**

Furthermore, we believe it is critical that provisions under ESEA enhance teacher and student knowledge of Technology\* and Engineering so that we can inspire the next generation of engineers, inventors, and innovators. **Therefore, we also recommend that reauthorization of ESEA:**

1. Expand and rename the “Math and Science Partnerships” to “STEM Partnerships” to include Technology and Engineering educators in professional development opportunities for teachers;
2. Include Technology and Engineering instruction, in addition to Math and Science, in any new provisions dealing with college and career ready standards, core curriculum development, the definition of rigorous curricula, and expanded learning time;
3. Encourage State science assessments to reflect the National Assessment of Educational Progress (NAEP) Science 2009 Framework, which includes technological design skills;
4. Help States prepare for the new computer-based NAEP Technology and Engineering Literacy Assessment due in 2014 by encouraging States to develop assessment indicators to related to Technology and Engineering for accountability purposes;
5. Allow informal STEM education centers and other non-profit educational organizations to receive federal funds to provide teacher professional development; and,
6. Encourage after school program funds to be used for Technology and Engineering learning, in addition to Math and Science activities.

*\* It is important to note that Technology (& Engineering) Education is not the same as Educational Technologies (i.e. computers and digital communication tools in the classroom). Technology & Engineering Education involves the application of math and science knowledge and skills in open-ended, hands-on, problem-solving, and engineering design challenges using tools, materials and processes.*

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Respectfully submitted by,

- American Society for Engineering Education
- American Society of Civil Engineers
- Arc Capital Development
- BEST Robotics, Inc.
- Center for Innovation in Engineering and Science Education, Stevens Institute of Technology
- Center for Minority Achievement in Science and Technology
- Chicago Educational Publishing Company
- Colorado Technology Education Association
- Delaware Foundation for Science and Mathematics Education

Eastwood Middle School Career Cluster Technologies, AL  
Hofstra University Center for Technological Literacy  
International Technology and Engineering Education Association  
International Technology Engineering Education Association/Council for Supervision and Leadership  
IBM Corporation  
IEEE-USA  
INSPIRE, Institute for P-12 Engineering Research and Learning, Purdue University  
Intel Corporation  
JETS  
Kentucky Engineering & Technology Education Assoc  
Illinois Mathematics and Science Academy  
Massachusetts Technology/Engineering Education Collaborative  
Museum of Science, Boston  
National Alliance for Partnerships in Equity  
National Association of State Directors of Career Technical Education Consortium  
National Center for Technological Literacy  
National Institute of Building Sciences  
National Science Education Leadership Association  
National Society of Professional Engineers  
New Jersey Technology Education Association  
New York Hall of Science  
New York State Technology Education Association  
North Carolina Technology Education Association  
North East Ohio Technology & Engineering Educators Association  
Ohio Technology and Engineering Educators Association  
Ohio Technology Education Advisory Council  
Pennsylvania Technology Student Association  
PTC  
PTC-MIT Consortium  
Real World Design Challenge  
Sloan Career Cornerstone Center  
Teachers Clearinghouse for Science and Society Education  
Technology Education Association of Pennsylvania  
Technology Education Department at Cuyahoga Falls High School, OH  
The Ohio Academy of Science  
The STEM Academy  
Triangle Coalition  
Tuscaloosa Magnet Middle School  
University of Pittsburgh at Johnstown  
Urban STEM Strategy Group, Philadelphia  
Valley City State University, ND  
Western Illinois University College of Business and Technology  
Western Illinois University School of Engineering  
Worcester Polytechnic Institute, K-12 Outreach Office