

PTC-MIT Consortium
Addressing the STEM Workforce: Maintaining US Competitiveness and Innovation in a Global Economy & Ensuring National Security

What is the PTC-MIT Consortium?

Mission: To address the STEM Workforce through a partnership with the federal government

The PTC-MIT Consortium represents 80 organizations committed to working together, leveraging interests and investments to ensure a robust and reliable STEM pipeline that will help secure America's continued competitiveness, innovation and national security in a global knowledge economy, and provide opportunities for individuals, families and regions to take advantage of the many opportunities the STEM workforce has to offer.

The PTC-MIT Consortium has significant geographic reach and connections to communities that implement change at the local level. Its member constituents across the US include federal & state agencies corporations, professional societies, higher education, K-12 education, groups serving minorities and women, persons with disabilities, informal science centers, community education programs.

PTC-MIT Consortium Working Group members set strategic direction and include: ACT, Inc., Boston Museum of Science, Cambridge University, Carnegie Mellon University, Center for the Advancement of Scholarship on Engineering Education, Design & Technology Education Association, Education Development Center, Harvard University, International Technology Education Association, International Society for Technology in Education, Massachusetts Institute of Technology, MPR Associates, Inc., National Council for Community & Education Partnerships, Parametric Technology Corporation, Pennsylvania Department of Education, State Educational Technology Directors Association, and Texas Southern University

Benefits of a partnership between the US Government and the PTC-MIT Consortium:

1. Leverage and focus the nation's resources and expertise to address the STEM workforce needs;
2. Build on existing national strengths and invite participation of all agencies/stakeholders in this critical national effort;
3. Strengthen the national pool of STEM talent which is strategic for the US;
4. Improve the quality of STEM programs by integrating state-of-the-art tools;
5. Provide a vehicle for the dissemination and implementation of initiatives across the US that reaches all 50 states and territories, potentially impacting more than 24 millions students, 1 million teachers, 48,000 schools*, and 3 million youth in after school programs.**

*National Center for Education Statistics, Common Core of Data, 2003-2004.

**Afterschool Alliance.org, The numbers cited represent approximately 50% of the totals for the US populations in each group.

STEM Workforce Talking Points

Problem:	The PTC-MIT Consortium proposes to:	How:
1a) The nation's STEM workforce development system is unreliable. The STEM pipeline is leaky. Mapping Standards, Programs and Curricula at the K-12 and University levels to Critical Skill Needs will focus the nation's education resources on addressing the STEM workforce challenge.	1b) Map Standards, Programs and Curricula at the K-12 and University levels to Critical Skill Needs	1c) The PTC-MIT Consortium's STEM framework aligns vectors of self interests and capability, providing an organizer that compels us to leverage existing investments, recognize and honor the many excellent programs in place, reduce duplication and identify gaps, facilitate partnerships/connections and invite participation of all stakeholder programs to become part of this national effort.
2a) "Technological thinking" is at the heart of innovation in the 21 st century. To ensure a robust, competitive STEM workforce, we must ensure that our schools offer all youth an opportunity to become "technological thinkers" and innovators.	2b) Enhance the Re-Authorization of No Child Left Behind (NCLB) by Strengthening Technology	2c) Our economic competitiveness of tomorrow is rooted in the quality of our education system today. Many of our nation's critical skills STEM jobs cannot be out-sourced or filled with foreign talent. Technology in NCLB needs to be enhanced in the following ways to ensure that all Americans have the opportunity to become "technological thinkers", and to develop and demonstrate core STEM skills and abilities: (a) new Titles need to be added for "Technology Education" focusing on Design and "Use of Data and Accountability"; and (b) the current sections on Technology need to be strengthened with modifications such as adding "Technology for School Administration" and updating the "Definition of a Highly Qualified Teacher".
3a) The ability to design and an understanding of the design process are core competencies for success in a global economy driven by technology. The US education system lacks the capacity to ensure that learners develop these skills.	3b) Provide schools with design capabilities	3c) While a foundation in math and science is important, preparing learners in these areas alone will not address critical STEM workforce requirements. Applying mathematics and science principles to real world challenges through design deepens learning and advantages US learners. We will enhance design capabilities at schools by

		training teachers, providing materials and design projects that use the latest approaches found in business and government
4a) Maintaining STEM leadership in a global knowledge economy requires “global engineering”.	4b) Prepare Students for “Global Engineering”	4c) To retain our competitive advantage as technology leaders in the global marketplace, we must become the foremost nation of “global engineers” who are innovative, creative, able to understand business issues (budding entrepreneurs), are fluent in software use, comfortable with networked collaborative design, comfortable with foreign languages and working in culturally diverse teams. We will prepare students for “global engineering” using collaborative team-based design across education levels and geography, maximizing expertise and making it available across the educational spectrum.
5a) An industry/higher education-endorsed Assessment and Certification Program will enable the nation to document progress and provide students with a life-long, portable STEM credential to document their lifelong education and professional development.	5b) Assess and Certify the Acquisition of Critical Skills	5c) We propose to establish an industry/higher education-endorsed Assessment and Certification Program for students. It will validate and document their critical skills. Students will be able to demonstrate levels of performance, based on skills obtained throughout their educational and professional careers. They will be able to maintain a web-based portfolio of their work that they can present to gain admittance to higher education or apply for jobs. This Certification will provide more detailed information than a score on a test or a degree.
6a) 21st century skills of adaptability, creativity, imagination and entrepreneurship are learned and developed through the design process that integrates deep academic knowledge and technical skills, and that connects and reinforces concepts across the curriculum.	6b) Strengthen the Foundation of Technology Learning in Schools and Connect it Across the Curriculum	6c) Technology Education (learning how to solve problems and extend human potential through design) will be encouraged and linked with other subjects such as Science, Math, and Educational Technology (learning how to use technologies). Activities will focus on topics where there are shortages and strategic need such as Engineering, Physical Sciences and Material Sciences.

<p>7a) Dissemination and implementation of critical, time sensitive initiatives creates significant challenges for decentralized US education and training systems.</p>	<p>7b) Provide a Dissemination and Implementation Network Across the US.</p>	<p>7c) The PTC-MIT Consortium leverages the power and reach of 80 partner organizations across the country to disseminate and implement education initiatives in every state and territory. Each of the organizations in the PTC-MIT Consortium has connection or “ownership” of key areas of STEM education and employment at all levels from K-university education through professional practice.</p>
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