Recommendations on STEM Education
Prepared for the 2016 Presidential Candidates
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Advancing science, technology, engineering, and mathematics (STEM) education for American students must be a central element of a broad-based agenda to promote U.S. prosperity and innovation. STEM education is closely linked with U.S. economic success and strong STEM skills are a central element of a well-rounded education.

In today's economy every student needs to have a strong foundation in the STEM subjects in order to land and succeed in virtually any job – from the shop floor to the research lab to the boardroom. Further, the best, highest-paying jobs are nearly all in the STEM fields. The steps we take to prepare our children now in STEM will have an enormous impact on the future of our economy, our national security, and America's continued leadership in science and technology.

As an alliance of more than 600 education, business, and professional organizations, the central mission of the STEM Education Coalition is to inform federal and state policymakers on the critical role of STEM education. We appreciate the opportunity to share our views and brief recommendations withthe 2016 Presidential candidates.

Key Elements of a National STEM Education Agenda

- **Bipartisan:** Policies to promote STEM education as a national priority can and should be bipartisan and evidence-based. Such policies would be supported by a strong and united community of stakeholders and advocates in the business, professional, research, and education communities.
- **All Hands on Deck:** A STEM agenda must embody an "all hands on deck" approach to improving STEM education and increasing student achievement in these subjects that integrates K-12, higher-education, informal, and research elements and employs resources across the federal government.

Key Elements of a National STEM Education Agenda (cont'd)

- **Broaden the Pipeline:** We must expand the capacity and diversity of the STEM workforce pipeline and prepare more students for the best jobs of the future by working to raise achievement in the STEM fields for all K-12 students—particularly for girls, low-income students, students of color, and English Language Learners.
- **Educators:** We must better prepare teachers so that they are ready to meet the challenges of teaching in the STEM classroom, especially at the elementary level, and ensure that these teachers receive high quality professional development, support, and the necessary resources to effectively teach at all levels.
- **Innovation:** Embrace emerging trends and best practices in STEM education such as hands-on STEM competitions, integration of informal learning with classroom strategies, state of the art educational technologies, and project-based learning.
- **Partnerships:** Work with stakeholders to promote public-private partnerships, incentives, and effective business and industry engagement strategies in STEM education.
- **Workforce Focus:** Work with business and industry leaders to identify key workforce issues and use the bully pulpit of the Department of Education to help state and local administrators (principals, supervisors, curriculum developers) understand what encompasses quality STEM education and that STEM education is not limited to only math and science, but also embraces engineering, technology and computer science, and broadly encompasses related STEM fields and their unique needs.
- **Federal Funding:** Ensure that the Administration proposes -- and Congress provides-- full funding for the STEM-related programs outlined in the Every Student Succeeds Act and sustained investments in STEM-related educational research and innovation at the National Science Foundation.

10 Brief Policy Recommendations to the Next Administration

- Appoint a high-profile STEM education coordinator at the White House whose role will be to drive a STEM agenda across the federal government .
- Appoint qualified STEM education professionals to a wider range of federal advisory bodies, such as the President's Council of Advisors on Science and Technology and the National Science Board, and in White House and other senior federal agency policymaking positions.
- Convene a summit during the first 100 days at the U.S. Department of Education, led by the Secretary, with state, local and national STEM stakeholders, including business and workforce groups, to highlight and discuss major STEM policy issues with the goal of seeking input into a broad federal STEM agenda.
- Encourage states to emphasize student performance in science, alongside reading and mathematics, whendeveloping, evaluating and implementing the accountability provisions under the Every Student Succeeds Act.
- Direct the Secretary of Education to prepare an annual report to assess the degree to which states are utilizing the new authorities provided under the Every Student Succeeds Act to support and prioritize STEM education activities and student success.
- Publish an online guide for educators and students that showcases federal resources available to support STEM education and highlights research on best practices in teaching and learning and emerging areas such as STEM competitions, advancements and integration of informal learning, exciting opportunities for students, and increasing women and minority participation in STEM learning.
- Utilize the authority provided to the Secretary of Education by Section 2245 (STEM Master Teacher Corps) of the Every Student Succeeds Act to propose a national initiative to support high quality STEM initiatives in 5-10 leading states.
- Adopt a balanced approach to supporting community colleges, technician trade schools, and other degree granting institutions of higher education through federal post-secondary workforce education and training programs.
- Integrate the goal of broadening the STEM education pipeline, especially to women, girls, and students from under represented backgrounds, in the Administration's proposals for the reauthorization of the Higher Education Act.
- Propose robust, predictable, and sustained support for the National Science Foundation, including full funding of NSF'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.

10 Reasons Why STEM Education is Important

- 20 percent of all jobs require a high level of knowledge in any one STEM field and STEM workers earn 11 percent higher wages compared with their same-degree counterparts in other jobs.[i]
- Half of all STEM jobs are available to workers without a four-year college degree, and these jobs pay $53,000 on average—a wage 10 percent higher than jobs with similar educational requirements.[ii]
- 60 percent of U.S. employers are having difficulties finding qualified workers to fill vacancies at their companies. [iii]
- While the U.S. economy grapples with economic recovery, job postings in in the STEM occupations outnumber unemployed workers by nearly two to one.[iv]
- The top 10 bachelor-degree majors with the highest median earnings are all in STEM fields.[v]
- Although most parents of K–12 students (93 percent) believe that STEM education should be a priority in the U.S., only half (49 percent) agreed that it actually is a top priority for this country.[vi]
- Only one in five STEM college students felt that their K–12 education prepared them extremely well for their college courses in STEM.[vi]
- Only 45 percent of U.S. high school graduates are ready for college work in math and 30 percent are ready in science.[vii]
- Only one out of five households has access to and takes advantage of STEM-related after-school programming.[vii]
- Fewer than 40 percent of students who enter college intending to major in a STEM field complete a STEM degree.[viii]

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[i] Thomasian, John. (2011, December 1). Building a Science, Technology, Engineering, and Math Education Agenda: An Update of State Actions. *The National Governors Association Center for Best Practices.* Retrieved from 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.html

[ii] Rothwell, Jonathan. (2008, June 10). The Hidden STEM Economy. *Brookings Institution.* Retrieved from http://www.brookings.edu/research/reports/2013/06/10-stem-economy-rothwell

[iii] Council on Foreign Relations Independent Task Force. (2012). U.S. Education Reform and National Security. *Council on Foreign Relations.* Retrieved from http://www.cfr.org/united-states/us-education-reform-national-security/p27618

[iv] Change the Equation. STEM Help Wanted. Retrieved from http://changetheequation.org/stemdemand

[v] 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

[vi] http://www.microsoft.com/presspass/press/2011/sep11/09-07MSSTEMSurveyPR.mspx

[vii] http://www.changetheequation.org/sites/default/files/CTEq_VitalSigns2011_National_0.pdf

[viii] http://www.whitehouse.gov/blog/2012/12/18/one-decade-one-million-more-stem-graduates