

On June 18th, the STEM Business Leaders Coalition convened a breakfast meeting at the Museum of Science. The meeting provided an exciting opportunity for more than 150 STEM leaders from industry, government, education and non-profits to collectively urge that STEM be a statewide priority. It also provided the forum for the release of "Tapping Massachusetts Potential: The Massachusetts Employers' STEM Agenda," a call-to-action and series of recommendations from Massachusetts employers on developing and implementing a comprehensive statewide STEM agenda. As part of the effort to assist with the creation of the STEM Coordinating Council, we surveyed the breakfast's participants, and asked them to prioritize the "Tapping Massachusetts' Potential" report's recommendations and provide other feedback that can be used to develop a work plan. Following is a summary of the survey's responses.

The survey was sent out to all individuals who registered for the STEM Business Leaders Breakfast. There were 83 responses from a variety of STEM stakeholders. Below is a distribution of respondents by employment sector. This distribution roughly approximates attendance at the breakfast:

- Industry: 33%
- Education (mostly Higher Ed.): 20%
- Trade Associations: 19%
- Government: 13%
- Non-profits: 11%
- Independent Consultants: 4%

Overall Summary of Findings – Recommendations for Prioritization

- 1) Develop a statewide STEM plan with concrete goals and measurable outcomes**
- 2) Organize a public education and outreach campaign, focused on parents, students, teachers and employers**
- 3) Coordinate existing initiatives to limit duplication and promote efficiency and effectiveness**
- 4) Promote programs that provide students with real-world experiences, particularly through employer participation**
- 5) Prepare teachers to teach STEM content effectively**

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Summary of Individual Survey Questions

Question 1: As its first recommendation, the “Tapping Massachusetts’ Potential” report calls for ***building public support for making improvements in STEM performance a statewide priority***. Please indicate how important each of the following strategies from the report are to achieving the recommendation. Mark no more than two items as “very important.”

The highest priority (70.7%) was to “launch a campaign to help parents, students, employees and community leaders understand why the STEM disciplines are so important to individual success and national prosperity.”

A majority of respondents (57.3%) also support the creation of statewide STEM plan, with clearly established goals and objectives for the next 5 years

Themes from the Open Response section:

- Role models should be incorporated, both into the campaign as well as in the STEM plan. “Role models are essential to making the value of STEM education real to students.”
- There should be an inventory of the state’s STEM programs, “to support and expand best practices and eliminate ineffective programs.”
- There must be strong, state level leadership.
- Employers should be encouraged to participate in STEM initiatives, and should be targeted by a campaign because of the importance of this issue to the economy.

Question 2: As its second recommendation, the “Tapping Massachusetts’ Potential” report calls for ***motivating Massachusetts’ students and adults, especially those in underrepresented groups, to study and enter STEM careers and remain in the state after graduation***. Please indicate how important each of the following strategies from the report are to achieving the recommendation. Mark no more than three items as “very important.”

The highest priority (74.1%) was “advocating for curricula that includes rigorous content as well as real-world engineering and science experiences so that students learn what it means to do this work, what it takes to get there, and how exciting these fields are.”

A majority of respondents also supported initiatives to create more scholarships and loan forgiveness programs for STEM graduates who plan to stay and teach math and science, particularly in high-poverty districts (61.3%), as well as increasing opportunities for immersion experiences and corporate internships (56.3%).

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Conversely, increasing dual enrollment programs (21.5%) and encouraging additional STEM degree programs at public colleges and universities (30.4%) did not garner significant support.

Themes from the Open Responses:

- Parents and students need to be educated “about the depth and breadth of careers available.”
- Give students opportunities to participate in hands-on, real-world projects in STEM fields.
- “Coordination of existing initiatives and replication of the most effective ones are the first step.”

Question 3: As its third recommendation, the “Tapping Massachusetts’ Potential” report calls for **improving K-12 STEM teaching to foster student achievement and meet increased demand, including differentiated pay scales for math and science teachers**. Please indicate how important each of the following strategies from the report are to achieving the recommendation. Mark no more than four items as “very important.”

The highest priority (78.2%), was “supporting cost-effective professional development and other technical assistance to fill gaps in teachers’ content knowledge and prepare them to teach the content effectively.”

A majority of respondents identified strengthening and enforcing provisions for STEM teachers to have the requisite knowledge in the subjects they are assigned to teach (57.1%), increasing the public and private investment in STEM infrastructure (54.4%), and promoting market performance based compensation and benefit packages to attract and retain effective STEM teachers (51.9%).

Theme from the Open Responses:

Need to promote opportunities for teachers to partner with experts in STEM fields, math and science teachers, and college and university STEM faculty, and engage in externships or outside research projects.

Question 4: Based on your knowledge and documented research, what education level(s) and groups(s) should the STEM programs and initiatives target?

Middle school students (94.8%) and instructors (94.8%), and high school students (94.7%) and instructors (94.7%) were identified as the most important targets for STEM programs. 90.8% also identified high school guidance counselors as good targets.

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There was less support for pre-K and K-4, though there was an understanding that instructors at the pre-K level (81.3%) and at K-4 (86.3%) are important.

Interestingly, more respondents identified students and instructors as those to target, as opposed to parents. While parents were identified as good targets in pre-K (72.9%), K-4 (82.2%), middle school (90.9%), and high school (86.8%), in no category were they prioritized over students and instructors.

Themes from the Open Responses:

- After-school and out-of-school-time programs should also be targeted.
- Focus on the students, and work across age groups. “The system is for the students. Focusing on the students means ALL the other stakeholders will become part of the solution.”

Question 5: At the STEM Business Leaders Breakfast on June 18th at the Museum of Science, Lt. Governor Tim Murray announced the Patrick Administration’s intention to create a STEM Coordinating Council which would be chaired by the Lt Governor himself. What do you think should be the primary focus of the Council’s mission?

67 of the 83 respondents answered this question. Responses indicate the following five priorities:

Statewide STEM Plan. “Set the 1-3-5 year objectives;” “set achievable goals, identify the resources to achieve the goals, and assign someone to be accountable for follow-through;” “a clear and consistent plan and funding approach;” “create a STEM plan with clear deliverables;” “establish long-term goals and specific metrics;” “set a concrete action plan for the state;” establish an overarching vision with clear objectives;” etc.

Coordination. “Serve as the coordinating body of all STEM education initiatives in Massachusetts;” “coordinate STEM initiatives at all levels;” “encourage program centralization;” “coordination between public school and universities and industry;” “connecting business, higher ed, k-12 and pre-k across the continuum to drive STEM education in the state;” “coordinate efforts to avoid duplication and promote efficiency and effectiveness;” “one point of contact coordinating statewide STEM initiatives;” etc.

Outreach/Raise Awareness. “Government’s best role is to raise the STEM profile;” “raise profile of STEM investment potential;” “provide PSAs about the importance of STEM educational opportunities, teacher preparation, and global competitiveness;” “increase awareness of STEM topics to students. It starts with them;” “highlight the importance of STEM initiatives in the Commonwealth;” “raise awareness and create support at the legislative and educational leadership level in MA;” etc.

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Teacher Effectiveness. “promote teacher effectiveness in engaging students in STEM;” “improve STEM teaching and course offerings in our public schools;” “create mechanisms for getting qualified teachers into high schools;” “new teaching and learning strategies for preK-8 before interest in STEM is lost;” “improve the teaching of STEM subjects in K-16;” “increase quality of STEM education statewide by improving teacher quality;” etc.

Business Engagement. “work with industry to provide meaningful opportunities such as summer internship programs;” “connect industry leaders to education;” “engage business in a collaborative effort with educators and government to advance STEM through co-op, job and volunteer programs;” “industry has to better communicate the skills and knowledge that are necessary to succeed;” “should be a public/private partnership that gets more private companies to support with time/resources/funding;” “coordinate donations from business community for STEM education, mentoring and resources;” “ensure a constant effective collaboration between business and education;” “work with business community on implementing a specific agenda;” etc.

Question 6: Please select the importance of the following areas in which social networking and collaboration tools, such as Facebook, Myspace, Twitter, or any other online communities, may be used to achieve STEM goals.

66.2% of respondents thought that social networking was a very important way to provide messages to students. In addition, majorities identified social networking as a very important way to inform students about new technologies or projects (58.7%), connect students to professionals (56.8%), and connect educators to students (50.7%).

Very few found social networking to be an important way to provide messages to teachers (28.4%) or parents (16.2%).

Themes from the Open Responses (for those who didn't think social networking was important):

- Should be viewed as one of many communication vehicles, not a strategy in and of itself.
- May be difficult to incorporate social networking into school culture.

Question 7: Would you be willing to remain engaged in the effort to meet the goals established in the “Tapping Massachusetts’ Potential” report? If so, how?

More than 80% of respondents indicated that they would be willing to remain engaged by serving on Task Forces or Commissions (82.9%) or participating in focus groups (81.6%).

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Themes from the Open Responses:

- MBAE, Mitre Corporation, Shire, and Northeastern University all specifically offered to help.
- Other offers to help were made for data collection, processing and analysis; developing an inventory of current practices; recruit other technology-oriented professionals to get involved; student ambassadors to help “get STEM message out;” and social media.

Question 8: Please share any additional thoughts regarding the STEM agenda or the process of moving it forward in the Commonwealth.

- Mostly congratulatory comments and words of encouragement.
- “At best, bureaucracy, standardization, and central control will produce sustaining innovations.”
- “The college curriculum is not well aligned with industry standards or demands for workforce needs.”
- “A focus on engaging under-represented and low-income students is particularly important, as is increasing awareness among parents.”
- “This initiative should focus only in part on graduating STEM professionals, and should explicitly and consistently aim to achieve technical literacy for all MA citizens.”
- “This would be easier in a healthy economy.”
- “To get to kids, get to their influencers (parents, guidance counselors, teachers, community leaders) and inform them so they can inform kids.”
- “There needs to be collaboration between education and labor and workforce development at the state level.”
- “We are not making our schools STEM friendly and they need to be in order to engage students, parents, teachers, and the communities in need.”
- “We need to scale up programs that are working across the Commonwealth, both in terms of student interest and teacher quality.”
- “Preparing global thinkers in STEM and in all areas is critical to our economic growth.”

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