



MASSACHUSETTS BUSINESS ALLIANCE FOR EDUCATION PUBLIC COMMENT TO THE BOARD OF ELEMENTARY AND SECONDARY EDUCATION - December 19, 2017 REGARDING COMPUTER SCIENCE EDUCATION

The Massachusetts Business Alliance for Education (MBAE) is committed to a high-quality education system that prepares all students to engage successfully in a global economy and society. For three decades MBAE has worked to ensure all students graduate from high school with the knowledge and skills they need to participate fully in a global society and competitive workforce.

We were delighted to learn that this Board intends to focus on computer science education at the joint meeting with the Board of Higher Education scheduled for January 23, 2018 at Bridgewater State University. Computer Science is foundational for every child, regardless of career. "Technology" jobs are no longer relegated to the high tech industry. Jobs requiring computer science skills can be found in retail, healthcare and finance. MBAE and our twenty-four Affiliate organizations are concerned that every child in every school acquire a conceptual understanding of computing and have equal opportunities to pursue advanced computer science study if they so choose.

In Massachusetts, computing jobs are projected to grow 22% by 2024. Almost 1 in 4 jobs (23%) in Massachusetts involve computer science skills, yet we are not preparing enough of our residents to compete for these opportunities. In the last 12 months alone there were over 100,000 openings in Computer Science/ Information Technology and IT-adjacent jobs¹. 76% of Massachusetts tech company leaders report that talent challenges are a barrier to company growth. These are living-wage positions with salaries ranging from approximately \$50,000 to over \$90,000. According to the Massachusetts Technology Leadership Council (MassTLC), the high-tech sector directly and indirectly produces 46% of the payroll in Massachusetts².

To ensure all Massachusetts students have access to K12 computer science education, the following actions need to be discussed with the Board of Higher Education:

1. Create a Computer Science K-16 State Plan

MBAE urges the Boards to immediately take steps to create a state plan that addresses these inequities and puts digital equity at the top of the state's STEM agenda. Equitable access to computer science is critical. Statistically, students in the poorest high schools have the least access to computer science. Yet, students who learn computer science in high school are 6 times more likely to major in it; women are 10 times more likely. Exposure to computer science leads to economic opportunity for students. Computing jobs are now the #1 source of new wages in the United States.

¹ Technology Jobs in Massachusetts: The Demand for a Massachusetts Technology Workforce.

<https://www.achieve.org/files/TechnologyJobsinMassachusetts.pdf>

² State of Technology 2016: How the Massachusetts Tech Ecosystem is Creating New Growth Opportunities.

<http://www.masstlc.org/2016-state-of-technology-report/>

2. Make Computer Science Count

Now that the 2016 Massachusetts Digital Literacy and Computer Science Standards have been approved, it is essential that the state set a policy to allow computer science to fulfill students' high school graduation requirements. Students need this clear incentive to take these courses. Districts need this clear incentive to ensure every student has access to computer science courses. Currently, Massachusetts does not provide this incentive whereas 35 other states do and they are seeing positive results. When computer science counts for graduation, diversity increases. The year following a policy change to allow computer science to satisfy a core graduation requirement, states see the average number of AP computer science exams per school increase by 10%, exams taken by female students increase by 24%, and exams taken by underrepresented minority students increase by 26%. And computer science participation is 19% higher in states that allow it to count, 48% higher among female students, and 64% higher among underrepresented minority students³. We encourage the Board's meeting in January to discuss how they can work together to incentivize districts to accomplish this goal.

3. Ensure Universal Access

It is important for Massachusetts High Schools to offer at least one computer science course to students and here are some reasons why: high school students who take AP computer science are twice as likely to try computer science in college and six times more likely to major in computer science than those who take non-AP computer science in high school. Women who learn computer science in high school are 10 times more likely to study it in college, and African American and Hispanic students are 7 to 8 times more likely to major in it.

Unfortunately, in the 2015-2016 school year, less than 2% of Massachusetts public high school students took the AP Computer Science exam. And, according to the College Board, only 151 schools in Massachusetts (34% of MA schools with AP programs) offered the AP Computer Science course. Of the 1,151 test takers⁴:

- 321 were female
- 65 were Black
- 80 were Hispanic
- 150 were low-income

The number of test takers does not compare to other subjects — Calculus, Statistics and Psychology AP exams have over 8000 test takers each⁵. It is imperative that we set a policy in place requiring all Massachusetts high schools to offer at least one computer science course to students.

4. Train Teachers in Computational Thinking

All teachers, regardless of subject or grade, should be able to appropriately use technology to help every student become digitally literate and understand the role and uses of computing in various disciplines. Licensing and certification of teachers should require competency in this area and public universities should adapt educator preparation to provide the necessary training to meet these expectations.

³ Does Making CS "Count" Make a Difference? <https://medium.com/@codeorg/does-making-cs-count-make-a-difference-7ab5ca6b8407>

⁴ Massachusetts Department of Elementary and Secondary Education

⁵ College Board AP Program Participation and Performance Data 2017 State Reports: Massachusetts. <https://research.collegeboard.org/programs/ap/data/participation/ap-2017>

MBAE members, partners and Affiliates recognize that an excellent education is the foundation EVERY student needs to live productive lives, join and lead the workforce, and earn a family sustaining wage that will enhance their own as well as our state's economic well-being. We are ready and committed to work with you to expand access to computer science courses aligned with the 2016 Massachusetts Digital Literacy and Computer Science Standards throughout the K-12 system to ensure that all students have the opportunity to be prepared for success in college, career, and citizenship. The evidence is clear that we need to make computer science a top priority in Massachusetts. It must be universal and equitably accessible to all students.

For more information, please contact:

Jackney Prioly Joseph, Director, Future Ready Massachusetts
Massachusetts Business Alliance for Education
617-737-3122 jpjoseph@mbae.org



MBAE Affiliates

MBAE Affiliates share our commitment to driving education improvements that will ensure all students get the education they need to be successful in college and career.

Blackstone Valley Chamber of Commerce
Bristol County Chamber of Commerce
Cape Cod Canal Region Chamber of Commerce
Concord Chamber of Commerce
Economic Development Council of Western Mass.
Greater Boston Chamber of Commerce
Greater Holyoke Chamber of Commerce
Greater Westfield Chamber of Commerce
Lynn Area Chamber of Commerce
Mass. High Technology Council
Mass. Technology Leadership Council
MetroWest Chamber of Commerce
Nashoba Valley Chamber of Commerce
Neponset Valley Chamber of Commerce
Newton Needham Regional Chamber
Orleans Chamber of Commerce
The Plymouth Area Chamber of Commerce
Retailers Association of Massachusetts
SouthCoast Chamber of Commerce
Springfield Business Leaders for Education
Springfield Regional Chamber
Stoneham Chamber of Commerce
TechNet
Worcester Regional Chamber of Commerce