

Congratulations! Your district has chosen to participate in the Programming the Acceleration of Computing and Equity (PACE) initiative. Below you'll find some helpful information about the history, context, and key characteristics of the PACE program.

The Computer Science Landscape

As we move closer to the Human-Technology Frontier in a world driven by technology, computer science literacy and fluency are fast becoming recognized as essential basic skills needed for success in life and work. Furthermore, employment opportunities for CS professionals are plentiful providing less resourced individuals opportunities to rise out of poverty, build economically stable families and strong communities. Accessing computer science education, however, can be challenging. Traditionally, computer science has not been a centerpiece of national, state, or district curricula. In 2013, less than 5% of high schools in the country provided a computer science course!

National computer science scaling efforts 2013-2019

In 2013, teachers were seen as the key to growing computer science in schools. The most interested and innovative teachers were identified within states and were provided with high quality professional development and computer science curricula. NSF, through its CS10K initiative (designed to develop 10,000 CS teachers to teach CS in 10,000 schools) and Code.org were among the leading funders at this time. Soon foundations began to come on board, adding funds to the effort to develop computer science capacity in schools.

An equity lens

For years, computer science in high school consisted of CS AP courses. Students taking high school computer science AP courses were approximately 80% male and 20% female, with 84% white or Asian and 16% black or Hispanic/Latinx. Over the last 10 years, there has been a national effort to address equity by providing many more opportunities for female and underrepresented students to take CS courses. Overall these efforts have had only modest success in moving the needle.

- While there has been an improvement in the number of female and underrepresented minorities taking CS courses, there has also been an increase in male white and Asian students taking these courses, with the result that there are very modest percentage gains for female and underrepresented students.
- While female students are performing nearly as well as males on the college board AP computer science exams, black and Hispanic/Latinx students continue to perform below white and Asian students.

Innovation in Massachusetts

Since 2013 Massachusetts has led in CS innovations. Over 2,000 of our state's 75,000 teachers were trained during this scaling-up period. This is especially significant because more than 95% of all teachers newly teaching CS had no previous background in computer science or engineering. As a result, the number of students taking the College Board Computer Science AP course/exam have doubled in this period, with an increase in both female and under-represented minority test takers. Massachusetts was one of the first states to develop K-12 Digital Literacy and Computer Science state standards, and was

also one of the first states to develop pathways for grade 5-12 Computer Science licensure. A new Massachusetts Teacher Education License (MTEL) exam in computer science is expected in the next year or so.

Why PACE?

The good news

During this period, 179+ of the state's 365 districts have begun offering computer science in either K-5, 6-8 or 9-12 (very few offered CS in two or more grade bands). There has been great visibility for the importance of CS education as an essential emerging 21st century literacy.

The not-so-good news

School systems have developed a pattern of *episodic* computer science course offerings based on *individual teachers* who were interested in taking computer science professional development and offering courses or integrating CS into K-5 curricula. This means that only some students in any grade level might have access to the one or two classes offered, and students might go 2-5 years between being able to take a computer science course. This episodic approach has resulted in: (1) a *lack of equity* in who has opportunity and access to computer science courses needed for future success and (2) an attempt to adequately prepare students to successfully pursue computer science related jobs, higher education and careers that will likely fall far short of it goal.

EIR grant

Education Development Center, Inc. (EDC), in collaboration with the Massachusetts Department of Elementary and Secondary Education (MA DESE), the Massachusetts Association of School Superintendents (M.A.S.S.), and the University of Massachusetts–Boston (Regional Partner for Code.org), received an EIR grant to build CS pathways through systemic reform focusing initially on middle schools. The grant supports several urban and rural districts serving over 10,000 students in reconfiguring their middle schools to prepare *all* students, including underrepresented and high-need students with the CS skills that are increasingly required for academic and professional success.

PACE Outcomes

The grant is designed to achieve the following outcomes:

- Increase student achievement and interest in computer science
- Elevate the quality of middle school computer science teaching through training and support
- Enable more equitable participation and progression in computer science education by underrepresented and high-need students
- Establish strong middle school computer science pathways for high school and Advanced Placement Computer Science
- Meet the demand for a workforce with foundational computer science skills and knowledge

We are honored to be working with your district in this important partnership.