CONNECTICUT STATE BOARD OF EDUCATION
Hartford

Position Statement on
Computer Science Education for All Students K-12

The Connecticut State Board of Education (Board) believes the promise of an excellent public education is to equip every child with the knowledge and skills needed to succeed in college, careers and civic life. Therefore, schools must provide challenging and rigorous programs of study that integrate the knowledge and skills necessary to enable students to become productive members of society. These expectations hold for all students regardless of age, gender, socio-economic status, race/ethnicity, native language, abilities or disabilities.

The Board believes that computer science is a key to developing and integrating 21st Century Skills (e.g., technology, communication, collaboration, critical thinking, problem solving, innovation, creativity, persistence). Every student deserves a high-quality, comprehensive computer science education that is rich in content and builds interdisciplinary literacy, problem-solving, critical-thinking and effective communication skills. The Board believes that the study of computer science should be available to all students and is an important component of a K-12 education that prepares each Connecticut student to become college and career ready.

Computational thinking will be a fundamental skill used by everyone in the world by the middle of this century.[1] The study of computer science is a catalyst for the development of computational thinking skills. It is a problem-solving process that empowers the integration of digital technologies with human ideas. Computational thinking is characterized by logically ordering and analyzing data and creating solutions using a series of ordered steps. Computational thinkers have the ability to confidently deal with complexity and open-ended problems. [2] Through computational thinking strategies, students develop parallel cognitive skills and unique ways of thinking about issues and problems. Students become empowered to create products and to move from being consumers of technology to producers and shapers of technology. Ultimately, computational thinking that evolves from the study of computer science fosters creativity and innovative thinking, and provides students with the confidence to adjust and adapt.

The Board believes that Connecticut schools must increase efforts to provide a comprehensive computer science education to all students. The Board believes that public education in Connecticut is obligated to ensure that students have, regardless of race, ethnicity or gender, access to a relevant computer science curriculum that fosters students' natural curiosity about the world. The integration of computer science into the K-12 curriculum should be purposeful and systemic, designed to motivate and prepare students to compete in a diverse and globally-driven workforce where science, technology, engineering and mathematics play a vital role.

The Board further believes that the study of computer science can prepare students for high-skill, high-wage, and high-demand careers. Since interest often results from experience, the evidence

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[1] Wing, Jeannette M. "Computational Thinking, 10 Years Later." Web log post. N.p., 23 Mar. 2016. Web. <https://blogs.msdn.microsoft.com/msr_er/2016/03/23/computational-thinking-10-years-later/>.

[2] Bajarin, Tim. "Why Schools Should Teach More Than Basic Coding." Time. Time, 16 Mar. 2016. Web. 29 June 2016.

suggests a direct correlation between exposure to computer science principles in the K-12 classroom and pursuit of further computer science studies in postsecondary education.[3] Regardless of whether students choose a career in a computer science-related field, they will benefit from learning to collaborate, answer complex questions, and develop solutions for real-world problems. These foundational skills and the ability to adapt to the future will allow students to adjust to industry trends in a rapidly evolving job market.

Finally, the State Board of Education believes that comprehensive K-12 computer science education is best realized through meaningful partnerships among business and industry representatives, post-secondary educational programs, community colleges and universities, community organizations, families, and school districts. Each of these stakeholders is necessary in order for students to understand the connections between their classroom work and the skills required to be college and career ready.

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[3] Blouin, Janet Seeley. "High School Seniors' Self-Efficacy and Interest in Computer Science Careers." The University of Georgia, May 2011. Web. 30 May 2016.

Components of High-Quality Computer Science Education: Guidelines for Policymakers

2016

The Connecticut State Board of Education provides the following guidelines to support collaboration among the state's various stakeholders to build a high-quality, comprehensive, and culturally responsive computer science education program for all Connecticut students. High-quality computer science education instruction should be content rich and address the core computer science areas of computational thinking, collaboration, computing practice and programming, computers and communication devices, and community, global, and ethical impacts. The realization of this vision is critical for our students' futures as active and engaged citizens and promotes their ability to succeed in a globally competitive computing-intensive world.

Department of Education's Responsibilities:
- o Lead a statewide effort to increase the quality of and expand access to computer science education at the elementary, middle and high school levels.
- o Develop a K-12 computer science framework.
- o Encourage appropriate professional development opportunities for computer science educators.
- o Develop relationships with professional computer science organizations, higher education institutions and business and industry to provide professional development programs, honor excellence in computer science education, and promote high-quality computer science instruction for all students.
- o Enable computer science courses to count toward a student's core graduation requirements.

School Districts' Responsibilities:
- o Ensure that computer science is made accessible to all students, especially traditionally under-represented groups.
- o Develop relationships with professional computer science organizations, higher education institutions and business and industry to provide professional development programs, honor excellence in computer science education, and promote high-quality computer science instruction for all students.
- o Develop high-quality, comprehensive K-12 computer science curricula.
- o Ensure instructional time for computer science education for all learners.
- o Provide meaningful professional development, resources, instructional materials, and technologies to support computer science education.
- o Provide introductory access to technology on an appropriate level that encourages participation, curiosity, and problem solving.
- o Foster confidence and encourage persistence in solving challenging and meaningful problems.
- o Implement age-appropriate computer science curriculum aligned to the K-12 Computer Science Framework.
- o Provide embedded and ongoing instruction in computer science activities in order to enhance and support education in core content areas.
- o Increase the number of students who take computer science courses at the high school level.

- o Offer a continuum of courses that will allow interested students to study facets of computer science in more depth and prepare them for entry into the work force or college.

Higher Education Institutions' Responsibilities:
- o Provide pre-service and in-service K-12 computer science teachers opportunities for professional development.
- o Embed coursework that incorporates computational thinking into pre-service programs.

Family, Community and Business and Industry Stakeholders' Responsibilities:
- o Advocate access to computer science instruction for all children.
- o Support creativity and encourage children to look at problems from multiple perspectives.
- o Engage students, schools and families in community-based computer science activities to support and enhance computer science education opportunities.
- o Develop ongoing, systemic partnerships with schools to support and enhance computer science education.

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