HB 170 COMPUTER SCIENCE
TESTIMONY BY TECH CORPS
NATIONAL EXECUTIVE DIRECTOR
LISA M. CHAMBERS
OHIO HOUSE OF REPRESENTATIVE
EDUCATION AND CAREER READINESS COMMITTEE
TUESDAY, MAY 9, 2017

Chairman Brenner, Vice Chairwoman Slaby, and Ranking Member Fedor: thank you for the opportunity to provide testimony today regarding academic content standards and curriculum requirements, as well as education qualifications for Computer Science instruction in Ohio's K-12 schools and districts.

My name is Lisa Chambers and I serve as the National Director of TECH CORPS. TECH CORPS is a national nonprofit organization headquartered in Columbus, Ohio and founded in 1995 by Gary Beach, Publisher Emeritus of CIO Magazine and author of *The U.S. Technology Skills Gap*. TECH CORPS is dedicated to ensuring K-12 students have equal access to Computer Science and Information Technology programs, skills and resources that enhance early learning and prepare them for college and career.

TECH CORPS develops Computer Science programs and deploys tech-savvy talent to assist K-12 schools and youth-serving organizations across the country. Over the years, partners such as JPMorgan Chase, Nordson Corporation, Progressive Insurance and IBM have provided TECH CORPS with the fuel to deliver much-needed technology resources to K-12 students and teachers.

We believe studying Computer Science, regardless of a student's ultimate occupation, provides the critical computational thinking, knowledge and practices necessary to be ready for college or career. We have observed first-hand how access to high-quality Computer Science learning puts students in the role of actively creating and designing *with* technology - not just passively using and consuming it.

The U.S. Bureau of Labor Statistics estimates that jobs in computer and mathematical occupations will increase by 18 percent in the 10 years leading up to 2022, creating more than 1.3 million job openings. In Ohio, computer and mathematical occupations are expected to grow nearly 15 percent in the same period.

Complete College America, a nonprofit organization that works with states to boost college completion rates and close achievement gaps, states that Ohio has a 23 percent skills gap, meaning that, of the available jobs forecasted, a significant number of the state's current and future adult population lacks the basic training and education needed to fill them.

As stated in a recent report issued by the Governor's Office of Workforce Transformation:
> Ohioans must acknowledge that we're living in a brave new world of massive, rapid and often disruptive technological change and advancement, and that the jobs of tomorrow will be increasingly technology heavy. The challenge Ohio faces is to make sure every Ohioan has the knowledge and skills needed to succeed in the 21st century workplace, and every Ohio business can find the skilled, adaptable workers they need to compete and thrive globally.

Computer Science is a foundational skill for the 21st century and focusing on broadening access to Computer Science in our State's K-12 schools has never been more important.

Yet, challenges in providing Computer Science education to students in Ohio include inadequate numbers of Computer Science teachers and limited investments in sustained Computer Science professional development for high school, middle school, and elementary school teachers.

Studies have shown that students who are exposed to Computer Science at an early age are significantly more likely to pursue computing degrees in college.

As part of our work, and in collaboration with the Teaching & Learning Collaborative, Cleveland State University and Franklin University, we have developed an innovative professional development model and curriculum focused on the integration of Computer Science and Computational Thinking into Mathematics for grades 3-4. We call this project E^{4}Tech.

Recognizing that the classroom teacher is one of the single most important variables in impacting student achievement, this project focuses heavily on providing elementary school teachers with the sustained professional development they need to confidently introduce 3rd and 4th grade students to Computer Science.

In E^{4}Tech, Computer Science and Computational Thinking is integrated into elementary school classrooms in a focused and coherent way, and not taught as an "add-on" for a select group of students. Our theory of action is based on the premise that when teachers are immersed in and utilize tasks that blend Computer Science, Computational Thinking and mathematics, increases in teacher understanding, self-efficacy, mathematics content knowledge and instructional practices occur. These shifts in classroom instruction can lead to increased student achievement. (Additional information about E4Tech on attachment)

Stated simply, an investment in Computer Science is an investment in the future of this State and our Country.

I would like to thank Representative Duffey and Representative Carfagna for the time and energy they have invested in this critical issue.

I also thank Chairman Brenner and the Committee for allowing me this opportunity to provide the Education and Career Readiness Committee with TECH CORPS' insight into academic content standards and curriculum requirements, as well as education qualifications for Computer Science instruction in Ohio's K-12 schools and districts.

TECH CORPS will continue to support efforts to expand Computer Science education in Ohio's schools. At this time, I would be happy to answer any questions that you might have.

Thank you.
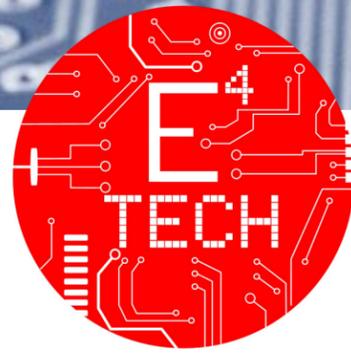
E⁴ TECH

Professional Development
for educators

Helping teachers and students learn mathematical concepts through a Computer Science/Computational Thinking-focused Curriculum

E⁴Tech: Engaging, Exciting and Empowering Educators through the "T" in STEM

E⁴Tech is an innovative professional development (PD) model and curriculum focused on the integration of computer science and computational thinking into mathematics for grades 3-4. Lessons are designed to emphasize mathematics and science content through a computer science focused curriculum in three innovative modules: Robotics, Programming and Circuits & Computing. The E⁴Tech curriculum aligns to Ohio's Learning Standards in Mathematics and national K-12 Computer Science Standards. The structure of the E⁴Tech PD model illustrates ESSA Level II Moderate Evidence and ESSA Level IIIi Promising Evidence.

Project Components
- 30 hours of Curriculum Modules: Programming, Robotics and Circuits
- All lessons align to Ohio's Learning Standards
- More than 100 hours of In-person and Online Professional Development
- Access to supplies and materials
- Evaluations and Assessments
- Training and ongoing support

Project Format
- Boost Sessions
- 2 week Summer Institute
- Online Interaction

Grade Band
- 3rd and 4th grade math teachers

Currently 46 teachers from 37 schools across 20 districts are participating in this project.

E⁴Tech focuses on demographically and geographically different areas in Ohio serving students typically underrepresented in STEM and CS classes.

Participating Ohio school districts include: Alliance City School, Avon Lake, Cleveland Metropolitan School District, Columbus City Schools, Elyria City Schools, Gahanna Jefferson Schools, Hilliard School District, Lorain City Schools, New Albany Plain Local Schools, Newark City Schools, Oregon City Schools, Parma Local Schools, Revere Local Schools, Reynoldsburg City Schools, Southwestern City School District, Toledo Public Schools, Westerville City Schools, Westland City Schools, Willoughby-Eastlake City Schools and Worthington City Schools.

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For more information, visit
bit.ly/E4TechInterest

Teaching & Learning Collaborative
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