Testimony and additions to S.B. No 957

Submitted by Winnie Yu
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Dear Education Committee,

My name is Winnie Yu, Computer Science faculty at Southern CT State University. I am the Director of the STEM Innovation and Leadership Office and have been teaching CS (computer science) as a full-time faculty for over 3 decades. I am the Vice-Chair of the Elm City Innovation Collaborative (ECIC) Project, which is the New Haven arm of the CTNext Innovation Places program. Today I am here to suggest a few additions to S.B. No. 957, Section 7 on Incentives for Pre-service Teacher Preparation.
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I would like to start by pondering what keeps CT prosperous, as a state where each person who wishes to work can find jobs, and where each student has the opportunity to learn and succeed. What keeps CT as a place of opportunities, where companies seek to build their business here, and where creativity is coupled with innovation and success.

CT is doing well. Some top CT industries are insurance and financial services, healthcare and bioscience, large-scale manufacturing, and digital technology, just to name a few.   To maintain this leading edge, problem solving with innovation is the key. Computer Science is the discipline that concentrates on computing and algorithmic processes, computational principles, hardware and software designs, implementation and how they can help solve today's problems. Computing is the backbone and foundational skill to many if not all of today's industries.   CT currently has over 7000 unfilled CS jobs and a projected 30% growth over the next 10 years. To address this strategic need, we need to invest in the talent pipelines.

The S.B. No. 957 is An Act concerning the inclusion of Computer Science Instruction in the Public School Curriculum Programs of Teacher Preparation and In-service Training Programs for Teachers. As stated in other testimonies, the need to include computer science in today's education curricula is undeniable. We need to educate today's students to be general users of computational skills as well as future scientists that lead the development and innovation of computing theories and applications to advance the discipline. Pre-service training is essential in providing a sustainable education system to continuously grow talents, foster leadership and strengthen workforce development.

Many educators, families and students already know the importance of learning computer science. There are numerous coding camps, hackathons, online learning resources, and summer coding enrichment programs as extra-curricular activities. The ECIC project has identified one of its goals as "New Haven – the city that codes".   Our public school system, however, is woefully behind. Although CT adopted the CSTA K-12 Computer Science Standards in 2018, with no certification system in place, there is no alignment yet between these standards and how pre-service teachers are trained to teach according to these standards. My first recommendation is to the Board of Regents to amend their statewide master plan to include goals and strategies that would require all pre-service teacher preparation programs to include at least one unit of computer science education. This recommendation is to train all pre-service teachers to integrate computational thinking into their discipline, supporting an evidence-based pedagogy across subjects to teach students to be technology users, providing wide exposure and broad learning in computing applications and problem solving for today's workforce.

It is perhaps even more critical that we educate future computer scientists and innovative technology developers to lead advancement in the computing field. This goal is to prepare

students with the depth of knowledge ready to become computing specialists when they enter higher education. This second recommendation is to the Connecticut General Assembly to fund pre-service education programs in the state to develop and implement pathways in computer science education. The pathways will prepare an enrolled pre-service teacher to add a certification or endorsement, as appropriate, to teach computer science education as their intended major and area of certification. The pathways will be open to pre-service teachers at both secondary and elementary levels.

My third recommendation is to extend the Alternative Route to Certification (ARC) program to include Computer Science education.   This will allow professionals, industrial experts as well as computer science graduates well versed in research and development to seek certification as educators, bringing their knowledge and practical experience to enrich the classrooms.   This is a very effective way to expand the pool of very qualified teaching professionals to bridge the gap. As it currently stands, since there is no existing certification in CS, interested CS professionals would need to get certified in a different area, e.g. math, physics, to become qualified to teach in computing.

There is tremendous effort to improve computer science education in public schools. My fourth and final suggestion is to share a report "2018 State of Computer Science Education: policy and implementation" prepared by Code.org. This report provides the rationale for integrating CS education as a measure of equity and access, capacity building, and sustainability to stay competitive. It also provides a state-by-state comparison in policy and implementation. The findings in this report are consistent with the recommendations suggested here.

I thank you for your time, and strongly urge you to consider adding my suggestions to S.B. 957.

Respectfully submitted,

Winnie Yu