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Middletown, CT.
06457

Rep. Robert Sanchez, Co-Chair
Sen. Douglas McCrory, Co-Chair
Rep. McCarty, Ranking Member
Sen. Berthel, Ranking Member
Education Committee
Legislative Office Building, Room 3100
300 Capital Avenue
Hartford, CT 06106

Regarding Raised Bill No. 957: 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.

Dear Gentlemen and Madam and distinguished members of the Committee:

I am Elizabeth Dillard President of the Connecticut Chapter of the Computer Science Teachers Association, a long-time teacher of Computer Science now teaching at CREC and a resident of Middletown, CT.

I would like to thank you for considering a bill that will make computer science a priority in Connecticut schools. I support Raised Bill No. 957 with the stipulation that it be strengthened considerably. Consider the first section which changes the words "computer programming instruction" to "computer science". This is appropriate given that the new standards adopted by the State Board of Education are titled "Computer Science Standard". But the law required computer programming instruction be offered in every school by the 2016-17 school year. Yet in 2017-18, only 103 schools offered a course. The number of students enrolled is up 22%. We can predict changing the name will not significantly affect the enrollment.

This is unfair to our students and our economy. Consider these numbers:

2017-18 Enrollment (EdSight)

- | | |
|-------------------------------|--------|
| 1. Computer Programming | 5,166 |
| 2. Probability and Statistics | 13,443 |
| 3. Calculus and Pre-Calculus | 24,060 |
| 4. Chemistry | 41,358 |

Compare this to P20Win projected Connecticut job growth:

1. Computer Science	6,552
2. Statisticians and Actuaries	360
3. Engineers	4,345
4. Chemists	123

The impact on our students future and our economy of this mismatch cannot be understated.

Among our problems are our lack of consideration of computer science as a normal subject in our schools. Consider these statistics:

- 35 States have certification pathways for Computer Science teachers. Connecticut does not.
- 44 States allow computer science to satisfy a math or science credit for graduation purposes. Connecticut leaves it to each District to decide.
- 20 States have set aside state funding for computer science professional development. Connecticut does not.
- 15 States requires High Schools to offer computer science. Connecticut has a law without accountability.

Amended is a language in the form of a bill our organization supports to address these and other fundamental issues.

We hope the committee will consider adding language from it to Raised Bill No. 957.

Yours truly,

CTCTSA President, Elizabeth Dillard

AN ACT ESTABLISHING THE CONNECTICUT K-12 COMPUTER SCIENCE INITIATIVE

Be it enacted by the Senate and House of Representative in General Assembly convened:

Statement of Purpose:

To create and expand opportunities for computer science education across Connecticut K-12 schools.

SECTION 1. DEFINITIONS.

(a) Computer Science means the study of computers and algorithmic processes, including their principles, their hardware and software designs, their implementation, and their impact on society. Computer Science is formally defined by the K-12 standards set by the Connecticut State Board of Education.

(b) High-quality professional learning means professional development activities that:

- (1) clarify the conceptual foundations of computer science,
- (2) teach research-based practices, including student centered and inquiry-based learning, and
- (3) are intended for existing teachers with or without prior exposure to computer science.

SECTION 2. CREATION OF THE COMPUTER SCIENCE FOR CONNECTICUT INITIATIVE.

(a) There is hereby created in the Office of the Governor the “Computer Science for Connecticut Initiative” (Initiative), and its Board of Directors. The administrator of the Initiative shall be the official the Governor’s Office designates to coordinate and oversee implementation of computer science programs.

(b) In carrying out the powers and duties granted in this section, the Initiative shall work in collaboration with the Connecticut State Board of Education, Connecticut State Department of Education, Institutions of Higher Education and the Department of Economic and Community Development.

(c) The Initiative board shall consist of the following representatives:

- (1) the Connecticut State Board of Education;
- (2) the Connecticut State Department of Education;

- (3) Business and Industry Organizations;
- (4) Educational Nonprofit Organizations;
- (5) Connecticut Association of Public School Superintendents;
- (6) The Connecticut Governor's Office
- (7) Institutes of Higher Education;
- (8) Citizen Advocates; and
- (9) Teacher leader from a statewide association representing computer science teachers.

(d) The purpose of the Initiative is to expand access to high-quality computer science education in grades kindergarten through 12th grade by strengthening the skills of educators and increasing the number of computer science teachers in elementary and secondary education.

(e) The Computer Science for Connecticut Initiative shall develop a state strategic plan for expanding computer science education in elementary, middle and high schools. The state strategic plan for a statewide computer science education program developed shall include the following:

(1) a statement of purpose that describes the objectives or goals the board will accomplish by implementing a computer science education program, the strategies by which those goals will be achieved, and a timeline for achieving those goals. Goals should include:

(a) Beginning in the 2020-2021 school year, teacher training shall begin and shall be completed in the 2023-2024 school year such that each public high school or public charter high school shall offer at least one (1) computer science course.

(b) Beginning in the 2020-2021 school year, teacher training shall begin and shall be completed in the 2023-2024 school year such that each public middle school or public charter middle school shall offer instruction in exploratory computer science.

(c) Beginning in the 2020-2021 school year, teacher training shall begin and shall be completed in the 2023-2024 school year such that each public elementary school or public charter elementary school shall offer computer science instruction in the basics of computer science and computational thinking to all students.

- (2) a summary of the current state landscape for K-12 computer science education, including diversity of students taking these courses;
- (3) a plan for expanding computer science education opportunities to every school in the state within 5 years;
- (4) a plan for defining high quality professional learning for teachers to begin teaching computer science;
- (5) an ongoing evaluation process that is overseen by the board;
- (6) proposed rules that incorporate the principles of the strategic plan into the state's public education system as a whole; and
- (7) a plan to ensure long-term sustainability.

(f) On or before September 19, 2019 the board's state strategic plan described in Subsection (e) shall be presented to the relevant legislative committees.

SECTION 3. Computer science — Required course offering.

(a) Beginning in the 2023-2024 school year, each public high school or public charter high school shall offer at least one (1) computer science course.

(b) Beginning in the 2023-2024 school year, each public middle school or public charter middle school shall offer instruction in exploratory computer science.

(c) Beginning in the 2023-2024 school year, each public elementary school or public charter elementary school shall offer instruction in the basics of computer science and computational thinking.

(d) A computer science course(s) or instruction in computer science offered by a public school or public charter school shall:

- (1) Be of high quality, as defined by the Connecticut State Board of Education; and

- (2) Meet or exceed the standards and curriculum requirements established by the Connecticut State Board of Education.

(e) Further, a computer science course offered by a public high school or public charter high school should be offered in an in-person setting, and be offered as a virtual or distance course option only when a traditional classroom setting is not feasible.

SECTION 4. COMPUTER SCIENCE PROFESSIONAL DEVELOPMENT.

(a) Subject to legislative appropriation, the Initiative shall administer a competitive grant program to eligible entities through the Initiative to develop and implement teacher professional development programs for the required computer science courses and content, as defined in Section 1.

(b) For the purposes of this Section, eligible entities include:

(1) A local educational agency, or a consortium of local educational agencies, in the state, including public charter organizations;

(2) High-quality computer science professional learning providers, including institutions of higher education in the state, non-profits, or private entities working in partnership with local education agencies.

(c) Eligible uses of the funding are as follows:

(1) High-quality professional learning for K-12 computer science content (including travel to workshops)

(2) Supports for K-12 computer science professional learning, including mentoring and coaching

(3) Creation of resources to support implementation

(4) Student recruitment

(d) As a condition of receiving the funds, eligible entities must submit an application to the Initiative. The application must, at a minimum, address how the entity will:

(1) Reach new and existing teachers with little to no computer science background;

(2) Use research- or evidence-based practices for high-quality professional development;

(3) Focus the professional learning on the conceptual foundations of computer science;

(4) Reach and support historically underrepresented students in computer science;

(5) Provide teachers with concrete experience with student centered, inquiry-based practices;

(6) Accommodate the particular teacher and students needs in each district and school; and

(7) Ensure that participating districts shall begin offering the course(s) and/or content within the same or next school year after the teacher receives the professional learning.

(e) Priorities for Awards. The Initiative shall prioritize the following applications:

(1) Local education agencies that are working in partnership with providers of high-quality professional learning for K-12 computer science.

(2) Proposals that describe strategies to enroll females and underrepresented minorities, students on free and reduced lunch, students with disabilities, and English language learners.

(3) Proposals from rural or urban areas with a low penetration of K-12 computer science offerings, including local education agencies that partner together to form clusters of implementation.

(f) Any monies remaining in the fund at the end of the fiscal year shall not revert to the credit of the general revenue.

(g) Metrics. The award recipient shall report annually, at a minimum:

(1) the number of teachers prepared,

(2) students reached,

(3) gender, racial, and socioeconomic diversity of those students,

(4) number and diversity of students with passing AP exam scores for high school AP courses once that data is available, and

(5) number of teachers that started implementing computer science (limited to middle and high school implementation) versus the number of prepared teachers that attended professional learning.

The State shall make these reports public.

SECTION 5. TEACHER CERTIFICATION.

(a) Before 2021-2022 school year, the Connecticut State Board of Education shall create certification pathways in computer science for all teachers who hold a valid license pursuant to this section and demonstrate sufficient content knowledge in the course material, as determined by the Connecticut State Board of Education.

SECTION 6. MAKING COMPUTER SCIENCE COUNT.

(a) The Connecticut State Department of Education shall, before July 1, 2019, develop a high school graduation policy applicable to Public Act No. 17-42 that allows a student taking a district-approved computer science course that meets the Board of Education approved computer science standard for high school-level courses to fulfill one unit of the nine credits in science, technology, engineering and mathematics credits required for high school graduation.

SECTION 7. INCENTIVES FOR PRE-SERVICE TEACHER PREPARATION.

Section 10a-6 of the general statutes be amended to create pre-service teacher preparation programs.

(a) The Connecticut General Assembly shall appropriate funds to eligible preservice education programs in the state to develop and implement pathways in computer science education. The pathways would prepare an enrolled pre-service teacher to add a certification or endorsement, as appropriate, to teach computer science education to their intended major and area of certification. The pathways would be open to pre-service teachers at both secondary and elementary levels, and may include collaborations among schools of computer science, schools of education, and non-profit organizations.

(b) The Board of Regents shall amend their statewide master plan to include goals and strategies that would require all pre-service teacher preparation programs to include a unit of computer science education.

(c) The Alternative Route to Certification (ARC) program shall be extended to include Computer Science education.

SECTION 8. APPROPRIATIONS

(a) Starting in the 2019-2020 fiscal year, the sum of \$2,000,000 in recurring funds annually for 5 years is appropriated from the General Revenue Fund to the Initiative to implement the provisions of this act. The balance of any appropriation not disbursed by the end of the annual fiscal year will be carried forward after the effective date of the original appropriation.