The Florida Senate

BILL ANALYSIS AND FISCAL IMPACT STATEMENT

(This document is based on the provisions contained in the legislation as of the latest date listed below.)

Prepared By: The Professional Staff of the Committee on Education Pre-K -12

BILL:	CS/SB 780
INTRODUCER:	Committee on Education Pre-K —12 and Senator Calatayud
SUBJECT:	Computer Science Instruction in K-12 Public Schools
DATE:	April 5, 2023
REVISED:	

	ANALYST	STAFF DIRECTOR	REFERENCE	ACTION
1.	Brick	Bouck	ED	**Fav/CS**
2.			AED	
3.			AP	

Please see Section IX. for Additional Information:

COMMITTEE SUBSTITUTE - Substantial Changes

I. Summary:

CS/SB 780 modifies requirements for the delivery of computer science instruction in public schools and modifies bonuses related to providing computer science instruction. Specifically, the bill:

- Authorizes public elementary schools to provide computer science instruction with the intent to provide a foundation for future computer usage, digital literacy, and computer science instruction.
- Specifies that digital skills in digital classrooms established by elementary and middle schools include computer science, multimedia presentations, and the manipulation of multiple digital graphic images.
- Expands to certified school counselors, social workers, career specialists, school psychologists, librarians, and media specialists the eligibility for funding and bonuses related to computer science instruction.
- Removes district school boards from the process of distributing funds from the Department of Education to eligible instructional personnel for training or bonuses related to computer science instruction.
- Requires any unexpended balance of funds appropriated for computer science instruction training and bonuses to be carried forward to the next fiscal year for the same purpose.
- Extends to qualifying elementary school instructional personnel eligibility for a bonus for teaching a computer science course, which is currently only available to public middle and high school teachers.

The bill takes effect on July 1, 2023.

II. Present Situation:

Computer Science

The influence of computing is felt daily and experienced on a personal, societal, and global level.[1] Computer science, the discipline that makes the use of computers possible, has driven innovation in every industry and field of study and is powering approaches to many of the world's challenges.[2] Computer knowledge and skills are increasingly being recognized as foundational for an educated citizenry as computer science is considered a central component of innovation, economic growth and employment.[3]

Computer science is also foundational for student success. Multiple studies have shown that students who study computer science perform better in other subjects, excel at problem-solving, and are 17 percent more likely to attend college.[4] Although 90 percent of parents want their child to study computer science, only 47 percent of high schools teach computer science.[5]

Computer Science Courses and Instruction

Florida law defines computer science as the study of computers and algorithmic processes, including their principles, hardware and software designs, applications, and their impact on society.[6] Computer science also includes computer coding and computer programming.[7]

Foundational skills for computer science learning include problem solving, such as computational thinking, understanding and recognizing patterns, understanding and implementing sequencing, and understanding representation, meaning how computers represent data.[8]

Computational thinking, which refers to the thought processes involved in expressing solutions as computational steps or algorithms that can be carried out by a computer,[9] is essentially a problem-solving process that designs solutions that capitalize on the power of computers.[10]

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[1] K12 Computer Science, *K12 Computer Science Framework* (2016), available at https://k12cs.org/wp-content/uploads/2016/09/K%E2%80%9312-Computer-Science-Framework.pdf at 1.
[2] Examples of challenges include decreasing automobile deaths, distributing medical vaccines, and providing platforms for rural villagers to participate in larger economies. *Id.*
[3] Education Commission of the States, *State-level Policies Supporting Equitable K-12 Computer Science Education* (2017), available at https://www.ecs.org/wp-content/uploads/MassCAN-Full-Report-v10.pdf at 7.
[4] Code.org, *Why Computer Science*, https://code.org/promote (last visited Mar. 30, 2023). Code.org, *More Data and Talking Points for Advocacy, Why study computer science*, https://code.org/promote/morestats (last visited Mar. 30, 2023).
[5] *Id.*
[6] Section 1007.2616(1), F.S.
[7] *Id.*
[8] K-12 Computer Instruction Framework Steering Committee, *K-12 Computer Instructional Framework* (2016), pgs. 183-198, available at https://k12cs.org/wp-content/uploads/2016/09/K%E2%80%9312-Computer-Science-Framework.pdf.
[9] *Id.* at 295.
[10] *Id* at 69.

Although typically associated with computer science, computational thinking can also be applied in the classroom setting through lessons in core subject areas.[11]

Florida public schools are required to provide students in grades K-12 opportunities for learning computer science including computer coding and computer programming.[12] Such opportunities may include:[13]

- Instruction on computer coding in elementary and middle school; and
- Instruction to develop computer usage and digital literacy[14] skills in middle school.

Elementary and middle schools may establish digital classrooms in which students are provided opportunities to improve digital literacy and competency; to learn digital skills, such a coding, multiple media presentation, and the manipulation of multiple digital graphic images. Students may also have the opportunity to earn digital tool certificates and certifications.[15]

Computer science courses must be offered to students in middle school and high school, including opportunities to earn industry certifications related to the courses.[16] Computer science courses and technology-related industry certifications that are identified as meeting mathematics or science requirements for high school graduation must be included in the course code directory.[17]

The Florida Virtual School (FLVS) must offer computer science courses identified in the Course Code Directory. If a school district does not offer an identified course, the district must provide students access to the course through FLVS or through other means.[18]

There are 72 middle and high school, as well as 2 elementary school, computer science courses currently identified in the course code directory.[19]

High School Graduation Requirements

In Florida, a student must successfully complete 24 credits specified in law, an International Baccalaureate curriculum, or an Advanced International Certificate of Education curriculum to earn a standard high school diploma.[20] The required credits may be earned through equivalent, applied, or integrated courses or career education courses, including work-related internships

[11] For example, in English language arts, students may be asked to analyze simple sentences and determine a framework for generating similar sentences, using pattern recognition and problem solving skills.Code.org, *Computational Thinking Lesson Assessment*, available at https://code.org/curriculum/course3/1/Assessment1-CompThinking.pdf.
[12] Section 1007.2616(2)(a), F.S.
[13] *Id*.
[14] Digital literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. American Library Association, *Digital Literacy*, https://literacy.ala.org/digital-literacy/ (last visited Mar. 30, 2023).
[15] Section 1007.2616(5), F.S. *See* s. 1003.4203, F.S.
[16] *Id*.
[17] Section 1007.2616(6), F.S.
[18] Section 1007.2616(3), F.S.
[19] Florida Department of Education, *Florida Course Code Directory Computer Science Course Information 2022-2023*, *available at* https://www.fldoe.org/core/fileparse.php/7746/urlt/2223CompSci.pdf.
[20] Section 1003.4282(1)(a), F.S.

approved by the SBE and identified in the course code directory. However, any must-pass assessment requirements must be met.[21] A student may also earn a standard high school diploma through the 18 credit Academically Challenging Curriculum to Enhance Learning Option (ACCEL)[22] or the Career and Technical Education Graduation Pathway Option.[23] Both 18 credit options also require students to meet English language arts, mathematics, science, and social studies credit and assessment requirements.[24]

To graduate, a student must complete the specified requirements, including 4 credits in mathematics and 3 credits in science, and earn a cumulative grade point average (GPA) of 2.0 or higher on a 4.0 scale.[25] A student must also pass the statewide, standardized grade 10 ELA FSA and the statewide, standardized Algebra I End-of-Course (EOC) assessment.[26]

A student who earns a computer science credit may substitute the credit for up to 1 credit of the mathematics requirement with the exception of Algebra I and Geometry, or up to 1 credit of the science requirement, with the exception of Biology I.[27]

Students may also satisfy mathematics and science graduation requirements through specified industry certifications, as follows:[28]

- A student who earns an industry certification for which there is a statewide college credit articulation agreement approved by the State Board of Education may substitute the certification for one mathematics credit, except for Algebra I and Geometry, up to two credits.
- A student who earns an industry certification in 3D rapid prototype printing may satisfy up to two credits of the mathematics requirement, with the exception of Algebra I, if the commissioner identifies the certification as being equivalent in rigor to the mathematics credit or credits.
- A student who earns an industry certification for which there is a statewide college credit articulation agreement approved by the State Board of Education may substitute the certification for one science credit, except for Biology I.

Evaluation of Instructional Personnel

Florida law requires each district school superintendent to establish procedures to evaluate the job performance of district instructional personnel.[29] The DOE must approve each school

[21] Section 1003.4282(1)(b), F.S. An equivalent course is one or more courses identified by content-area experts as being a match to the core curricular content of another course, based upon review of the Next Generation Sunshine State Standards for that subject. An applied course aligns with Next Generation Sunshine State Standards and includes real-world applications of a career and technical education standard used in business or industry. An integrated course includes content from several courses within a content area or across content areas.
[22] Section 1002.3105, F.S.
[23] Section 1003.4282(11), F.S.
[24] *Id.* and Section 1002.3105 F.S.
[25] Section 1003.4282(6)(a), F.S.
[26] Section 1003.4282(3), F.S.
[27] *Id.*
[28] Section 1003.4282(3)(b) and (c), F.S.
[29] Section 1012.34(1)(a), F.S.

district's performance evaluation system, which must, among other requirements[30], differentiate among the following four levels of performance: [31]

- Highly Effective.
- Effective.
- Needs Improvements or, for instructional personnel in the first 3 years of employment who needs improvement, Developing.
- Unsatisfactory.

Instructional personnel must be evaluated annually, except that newly hired classroom teachers must be evaluated at least twice in their first year of teaching in the school district.[32] Newly hired classroom teachers include first-time teachers new to the profession as well as veteran teachers new to the school district.[33]

Computer Science Teacher Training

Subject to an appropriation, a school district may apply to the DOE for funding to deliver or facilitate training for classroom teachers to earn an educator certificate in computer science or training that leads to an industry certification associated with a course identified in the course code directory, or for professional development for classroom teachers to provide instruction in computer science courses and content.[34]

A classroom teacher who was evaluated as effective or highly effective in the previous school year or who is newly hired by the district school board and has not been evaluated must receive a bonus if funds are available and the classroom teacher holds an:[35]

- Educator certificate in computer science or if he or she has passed the computer science subject area examination and holds and adjunct certificate issued by a school district, he or she must receive a $1,000 bonus after each year the individual completes teaching a computer science course at a public middle or high school, for up to 3 years.
- Industry certification associated with a computer science course, he or she must receive a bonus of $500 after each year the individual completes teaching the identified course at a public middle or high school, for up to 3 years.

District school boards are required to report a qualifying classroom teacher to the DOE by a date and in a format established by the DOE.[36] An eligible classroom teacher must receive his or her bonus upon completion of the school year in which he or she taught the course. A teacher may not receive more than one bonus per year.[37] The State Board of Education is required to adopt rules to administer the bonuses related to computer science instruction.[38]

[30] *See* s. 1012.34(2), F.S.
[31] Section 1012.34(1)(b), (2), and (3)(a), F.S. *See* rule 6A-5.030, F.A.C.
[32] Section 1012.334(3)(a), F.S.
[33] Rule 6A-5.030(2)(g), F.A.C.
[34] Section 1007.2616(4), F.S.
[35] Section 1007.2614(7), F.S.
[36] Section 1007.2616(7), F.S.
[37] Section 1007.2616(7), F.S.
[38] Section 1007.2616(8), F.S.

The appropriation to fund training for computer science and teacher bonuses for fiscal year 2022-2023 is $10 million.[39]

III. Effect of Proposed Changes:

CS/SB 780 modifies s. 1003.01, F.S., to provide definitions related to computer science instruction. Specifically, the bill defines:

- Computer science as the study of computers and algorithmic processes, including their principles, hardware and software designs, applications, implementation, and impact on society, and includes computer coding, computer programming, and computational thinking.
- Computational thinking as the thought process involved in expressing solutions as computational steps or algorithms that can be carried out by a computer.

The bill creates s. 1003.4202, F.S., related to computer science instruction in K-12 public schools, and aligns with existing requirements for computer science and technology instruction in s. 1007.2616, F.S. The bill consequently repeals s. 1007.2616, F.S.

The bill modifies requirements for the delivery of computer science instruction by district school boards. Specifically, the bill:

- Authorizes public elementary schools to provide computer science instruction with the intent to provide a foundation for future computer usage, digital literacy, and computer science instruction.
- Specifies that digital skills in digital classrooms established by elementary and middle schools include computer science, multimedia presentations, and the manipulation of multiple digital graphic images.
- Expands to certified school counselors, social workers, career specialists, school psychologists, librarians, and media specialists the eligibility for funding and bonuses related to computer science instruction. Accordingly, the bill defines instructional personnel to include classroom teachers, certified school counselors, social workers, career specialists, and school psychologists, and librarians and media specialists.
- Removes district school boards from the process of distributing funds from the Department of Education to eligible instructional personnel for training or bonuses related to computer science instruction.
- Requires any unexpended balance of funds appropriated for computer science instruction training and bonuses to be carried forward to the next fiscal year for the same purpose.
- Extends to qualifying elementary school instructional personnel eligibility for a bonus for teaching a computer science course, which is currently only available to public middle and high school teachers.

The bill takes effect July 1, 2023.

[39] Ch. 2022-156, s. 2, Specific Appropriation 100, Laws of Fla.

IV. Constitutional Issues:

A. Municipality/County Mandates Restrictions:

None.

B. Public Records/Open Meetings Issues:

None.

C. Trust Funds Restrictions:

None.

D. State Tax or Fee Increases:

None.

E. Other Constitutional Issues:

None.

V. Fiscal Impact Statement:

A. Tax/Fee Issues:

None.

B. Private Sector Impact:

None.

C. Government Sector Impact:

The bonuses provided in the bill for qualifying instructional personnel are subject to legislative appropriation. The appropriation to fund training for computer science and teacher bonuses for fiscal year 2022-2023 is $10 million.[40]

VI. Technical Deficiencies:

None.

VII. Related Issues:

None.

[40] Specific Appropriation 100, ch. 2022-156, s. 2, Laws of Fla.

VIII. Statutes Affected:

The bill substantially amends the following sections of the Florida Statutes: 1003.01 and 1003.4202.

The bill repeals section 1007.2616 of the Florida Statutes.

IX. Additional Information:

A. Committee Substitute – Statement of Substantial Changes:
(Summarizing differences between the Committee Substitute and the prior version of the bill.)

The committee substitute removes district school boards from the process distributing funds from the Department of Education to eligible instructional personnel for training or bonuses related to computer science instruction..

B. Amendments:

None.