

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 Appropriations

BILL: PCS/CS/SB 1056 (293960)

INTRODUCER: Appropriations Subcommittee on Pre-K-12 Education; Education Committee; and Senator Passidomo

SUBJECT: Computer Science Instruction

DATE: March 1, 2018

REVISED: _____

	ANALYST	STAFF DIRECTOR	REFERENCE	ACTION
1.	<u>Bouck</u>	<u>Graf</u>	<u>ED</u>	<u>Fav/CS</u>
2.	<u>Sikes</u>	<u>Elwell</u>	<u>AED</u>	<u>Recommend: Fav/CS</u>
3.	<u>Sikes</u>	<u>Hansen</u>	<u>AP</u>	<u>Pre-meeting</u>

Please see Section IX. for Additional Information:

COMMITTEE SUBSTITUTE - Substantial Changes

I. Summary:

PCS/CS/SB 1056 promotes opportunities for public middle and high school students to learn computer science taught by qualified teachers. Specifically, the bill:

- Expands access to computer science courses by:
 - Requiring middle schools and high schools to offer computer science courses.
 - Phasing in a requirement for school districts to offer computer science courses in a specified number of traditional public middle, high, and combination schools within a specified timeframe.
 - Requiring computer science courses that meet the specified definition to be identified in the Course Code Directory and on the Department of Education’s (DOE) website.
- Creates opportunities for teachers to be certified and trained to teach computer science courses, and requires the DOE to award funding, subject to legislative appropriation, to a school district or consortium of school districts to deliver or facilitate training for educators to earn a certificate in computer science or specified industry certification, or to pay fees for examinations that lead to a credential.
- Provides, subject to legislative appropriation, the following bonuses to a public school educator evaluated as effective or highly effective, or is newly hired:
 - \$1,000 after each year teaching a computer science course, for up to three years, if the educator holds a certificate in computer science or has passed the computer science subject area examination and holds an adjunct certificate.

- \$500 after each year teaching a specified course, for up to three years, if the educator holds an industry certification.
- Requires the DOE to provide, subject to legislative appropriation, high-need district technology grants to school districts for which the Florida digital classrooms allocation and the district's instructional materials fund are insufficient to meet the need.

The bill does not affect state revenues or expenditures. SB 2500, the Senate General Appropriations Act for Fiscal Year 2018-2019, does not provide an appropriation to the DOE for the components of the bill subject to legislative appropriations. These components include:

- Teacher bonuses.
- Funding for a school district or a consortium of school districts to deliver or facilitate training to enable teachers to earn certificates in computer science or applicable industry certifications.
- High-need technology grants to eligible school districts.

The bill takes effect upon becoming a law.

II. Present Situation:

Computing occupations are the primary source of all new wages in the United States and make up two-thirds of all projected new jobs in science, technology, engineering, and mathematics (STEM) fields.¹ In Florida, employment in computer occupations is projected to grow by 15.2 percent between 2017 to 2025.² In 2017, the estimated average annual wage for such occupations was \$79,518.³

Access to Computer Science Courses

Public schools are required to provide students in kindergarten through grade 12 opportunities to learn computer science including, but not limited to, computer coding and computer programming.⁴ Such opportunities may include:⁵

- Coding instruction in elementary and middle school;
- Instruction to develop students' computer usage and digital literacy skills in middle school; and

¹ Code.org, *Support K-12 Computer Science Education in Florida*, available at <https://code.org/advocacy/state-facts/FL.pdf>, at 1.

² Computer Occupations include Computer and Information Research Scientists, Computer Systems Analysts, Information Security Analysts, Computer Programmers, Software Developers, Applications, Software Developers, Systems Software Web Developers, Database Administrators, Network and Computer Systems Administrators, Computer Network Architects, Computer User Support Specialists, Computer Network Support Specialists, and Computer Occupations, All Other. Department of Economic Opportunity, *2017-2025 Statewide Projections*, available at http://lmsresources.labormarketinfo.com/library/ep/2017_2025/F25stw.xls.

³ The Florida Senate staff analysis of Department of Economic Opportunity, *2017 Wage Estimates, Florida*, available at <http://www.floridajobs.org/labor-market-information/data-center/statistical-programs/occupational-employment-statistics-and-wages>.

⁴ Section 1007.2616(1), F.S.

⁵ *Id.*

- Courses in computer science, computer coding, and computer programming in high school, including earning-related industry certifications.

Computer Science Courses and Industry Certifications

Currently, academic courses in computer science listed in the grades 9-12 section of the Course Code Directory (CCD)⁶ are limited to acceleration courses under the Advanced Placement, Advanced International Certificate of Education, and International Baccalaureate programs.⁷ Courses in computer science are also listed in the Career and Technical Education Program and Course Listing section of the CCD.⁸

In 2016, the State Board of Education revised the Next Generation Sunshine State Standards to include K-12 computer science standards.⁹ The Florida Department of Education (DOE) has identified general education courses that will incorporate the newly adopted computer science standards. At the secondary level, such course is “Meteorology Honors for Grade 9-12.”¹⁰

The DOE has also identified career and technical education courses and programs that contain the new computer science standards.¹¹ However, such courses or programs are not linked to any specified industry certifications.¹²

Teacher Qualifications

Educator Certification in Computer Science

The standard specialization requirements for an educator to be certified to teach K-12 academic computer science courses include:¹³

- A bachelor's or higher degree with an undergraduate or graduate major in computer science or computer science education, or
- A bachelor's or higher degree with 30 semester hours in computer science or computer science education to include credit in:
 - Computer applications and
 - Computer programming.

⁶ The Course Code Directory (CCD) lists all public preK-12 and postsecondary career and technical education courses available for use by school districts. Programs and courses funded through the Florida Education Finance Program and courses or programs for which students may earn credit toward high school graduation must be listed in the CCD. The CCD maintains course listings for administration and service assignments, K-12 education, exceptional student education, career and technical education, and adult education. Rule 6A-1.09441, F.A.C.. The CCD also includes details regarding appropriate teacher certification levels. Section 1012.55(1)(c), F.S.

⁷ Florida Department of Education, *2017-2018 Course Code Directory, Grades 9 to 12 and Adult Education Course Listing*, <http://www.fldoe.org/core/fileparse.php/7746/urlt/1718CCD-Basic9-12.pdf>, at 8-9.

⁸ Florida Department of Education, *2017-2018 Course Code Directory, Career and Technical Education*, <http://www.fldoe.org/core/fileparse.php/7746/urlt/1718-CCD-CTE.pdf>, at 129-162.

⁹ See rule 6A-1.09401(1)(n), F.A.C.

¹⁰ Florida Department of Education, *Course and CTE Programs that Include the New Computer Science Standards for the 2017-2018 School Year*, Memorandum DPS: 2017-26 (Mar. 3, 2017).

¹¹ *Id.*

¹² Email, Florida Department of Education (Jan. 11, 2018).

¹³ Rule 6A-4.0121, F.A.C.

The standard requirements for an educator to be certified to teach career and technical education courses and programs in information technology¹⁴ are specified in the appropriate secondary and postsecondary adult vocational program curriculum framework.¹⁵

General Requirements for Educator Certification

The Legislature has established certification requirements to assure that educational personnel in public schools possess appropriate skills in reading, writing, and mathematics, and adequate pedagogical knowledge, including the use of technology to enhance student learning, and relevant subject matter competence to demonstrate an acceptable level of professional performance.¹⁶

Each person employed as a teacher in a public school must hold a certificate required by law and rules of the State Board of Education.¹⁷ Educator certificates include the:

- Professional certificate, which is the standard, renewable type of certificate.¹⁸ The professional certificate is valid for up to five years.¹⁹
- Temporary certificate, for employment in full-time positions for which a Florida educator certificate is required.²⁰ The temporary certificate is valid for three school fiscal years and is nonrenewable.²¹

In addition, school districts are authorized to issue adjunct teaching certificates to part-time teachers who have expertise in the subject area to be taught.²²

¹⁴ The Information Technology Career Cluster incorporates four pathways. Network Systems; Information Support & Services; Programming & Software Development; and Interactive Media. Florida Department of Education, *Information Technology*, <http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/info-technology.stml> (last visited Jan. 12, 2018).

¹⁵ Florida Department of Education, *Information Technology*, <http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/curriculum-frameworks/2017-18-frameworks/info-technology.stml> (last visited Jan. 12, 2018).

¹⁶ Section 1012.54, F.S.

¹⁷ Sections 1012.55(1)(b) and 1002.33(12)(f), F.S. Teacher certification is administered and implemented by the DOE. Rule 6A-4.001, F.A.C.

¹⁸ Rule 6A-4.004(2)(a), F.A.C.

¹⁹ Section 1012.56(7)(a), F.S. The validity period is expressed as 5 years from July 1 of the school fiscal year. Rule 6A-4.0051(3)(c), F.A.C.

²⁰ Rule 6A-4.004(1)(a)2., F.A.C.

²¹ Section 1012.56(7), F.S. The validity period is expressed in school fiscal years. Rule 6A-4.004(1)(a), F.A.C.

²² Section 1012.57(1), F.S.

Educator Performance Evaluations

Instructional personnel²³ employed by Florida's public school districts must undergo an annual performance evaluation.²⁴

The evaluation system for instructional personnel must differentiate among four levels of performance as follows:²⁵

- Highly effective.
- Effective.
- Needs improvement or, for instructional personnel in the first 3 years of employment who need improvement, developing.
- Unsatisfactory.

Support for Technology in the Classroom

The DOE is responsible for developing a 5-year strategic plan for establishing Florida digital classrooms. The plan must:²⁶

- Describe how technology will be integrated into classroom teaching and learning to improve student performance outcomes.
- Identify minimum technology requirements that include specifications for hardware, software, devices, networking, security, and bandwidth capacity.
- Establish minimum requirements for professional development opportunities and training to assist district instructional personnel and staff with the integration of technology into classroom teaching.
- Identify the types of digital tools and resources that can assist district instructional personnel and staff in the management, assessment, and monitoring of student learning and performance.

The Florida digital classrooms allocation supports the efforts of school districts and schools, including charter schools, to integrate technology in classroom teaching and learning to ensure students have access to high-quality electronic and digital instructional materials and resources, and empower classroom teachers to help their students succeed.²⁷

²³ Instructor personnel means any K-12 staff member who provides direct instructional services to students or provide direct support in the learning process of students. Section 1012.01(2), F.S. Instructional personnel includes classroom teachers, student personnel services, librarians and media specialists, education paraprofessionals, and other instructional staff. *Id.*

²⁴ Section 1012.34(3), F.S. Newly hired classroom teachers are evaluated twice in their first year of teaching in a school district. *Id.*

²⁵ Section 1012.34(2)(e), F.S.

²⁶ Section 1001.20(4)(a), F.S.

²⁷ Section 1011.62(12)(a), F.S. The General Appropriations Act allocates \$80,000,000 for the Digital Classrooms allocation. Specific Appropriation 91, ch. 2017-18. The minimum amount allocated to each district is \$500,000. *Id.*

Florida Virtual School

The FLVS is intended to develop and deliver online and distance learning education.²⁸ The mission of the FLVS is to provide students with technology-based educational opportunities to gain the knowledge and skills necessary to succeed.²⁹ The school must serve any student in the state who meets the profile for success³⁰ in the online educational environment.³¹

III. Effect of Proposed Changes:

The bill amends s. 1007.2616, F.S., to promote opportunities for public middle and high school students to learn computer science taught by qualified teachers. Specifically, the bill:

- Expands access to computer science courses by:
 - Requiring middle schools and high schools to offer computer science courses.
 - Phasing in a requirement for school districts to offer computer science courses in a specified number of traditional public middle, high, and combination schools within a specified timeframe.
 - Requiring computer science courses that meet the specified definition to be identified in the Course Code Directory (CCD) and on the Department of Education's (DOE or department) website.
- Creates opportunities for teachers to be certified and trained to teach computer science courses, and requires the DOE to award funding, subject to legislative appropriation, to a school district or consortium of school districts to deliver or facilitate training for educators to earn a certificate in computer science or specified industry certification, or to pay fees for examinations that lead to a credential.
- Provides, subject to legislative appropriation, the following bonuses to a public school educator evaluated as effective or highly effective, or is newly hired, subject to legislative appropriation:
 - \$1,000 after each year teaching a computer science course, for up to three years, if the educator holds a certificate in computer science or has passed the computer science subject area examination and holds an adjunct certificate.
 - \$500 after each year teaching a specified course, for up to three years, if the educator holds an industry certification.
- Requires the DOE to provide, subject to legislative appropriation, high-need district technology grants to school districts for which the Florida digital classrooms allocation and the district's instructional materials fund are insufficient to meet the need.

Access to Computer Science Courses

The bill requires that high school students must be provided opportunities to take computer science courses to satisfy high school graduation requirements and phases in a requirement that

²⁸ Section 1002.37(1)(a), F.S.

²⁹ *Id.* at (b).

³⁰ The FLVS has identified hard and soft skills and other requirements that facilitate student success in online instruction. Such skills include written and oral communication, academic honesty, self-motivation, computer literacy, time management, reading competency, personal commitment, and access to technology. Email, Florida Virtual School (Jan. 9, 2018).

³¹ Section 1002.37(1)(b), F.S.

school districts provide students with access to computer science courses.³² Specifically, a school district with:

- More than 10 public middle, high, and combination schools³³ must provide computer science courses as follows:
 - Beginning in the 2018-2019 school year, at least one computer science course in no less than 4 percent of the school district's total number of middle, high, and combination schools.
 - Beginning in the 2019-2020 school year, at least one computer science course in no less than 7 percent of the school district's total number of middle, high, and combination schools.
 - Beginning in the 2020-2021 school year, at least one computer science course in no less than 10 percent of the school district's total number of middle, high, and combination schools.
- Ten or fewer public middle, high, and combination schools must provide at least one computer science course in at least one middle, high, or combination school by the 2020-2021 school year.

In 2016-2017, 31 school districts had more than 10 public middle, high, and combination schools, and 36 school districts had 10 or fewer such schools.³⁴

The bill specifies that a charter school is not required to offer a computer science course. However, enrollment of a charter school's students in a computer science course that meets the specified definition may be included in the school district's threshold associated with the number of public schools in the district that must providing computer science courses.

Computer Science Instruction through the Florida Virtual School

The bill requires the Florida Virtual School (FLVS) to offer computer science courses identified in the CCD. If a school district does not offer an identified computer science course, the district must provide students access to the course through the FLVS or through other means.

Student enrollment in computer science courses offered by the FLVS may also be used to satisfy the school district's threshold associated with the number of public schools in the district that must provide computer science courses.

Accordingly, school districts that do not provide computer science courses in the required number of schools, based on thresholds specified in the bill, may be required to add qualifying computer science courses to the courses offered by the district secondary schools. In addition, the school district may need to hire qualified teachers to teach such courses.

³² CS/SB 1056 defines "computer science" as the study of computers and algorithmic processes, including their principles, hardware and software designs, applications, and their impact on society, and includes computer coding and computer programming.

³³ The bill defines a combination school as a public school in which any of grades 6-12 are taught.

³⁴ Florida Department of Education, *Regular Elementary, Middle/Junior High, Senior High, and Combination Schools, 2016-17, Survey 2-FINAL*, available at <http://www.fldoe.org/core/fileparse.php/7588/urlt/RegElemMiddleHighCombo.xls>.

Computer Science Course Identification

The bill also requires that computer science courses that meet the specified requirements must be identified on the Department of Education's website and in the CCD no later than July 1, 2018. The State Board of Education must develop rules so that additional computer science courses may also be subsequently identified and posted. Accordingly, the DOE may need to update the CCD to accommodate the identification of computer science courses.

Teacher Qualifications

The bill provides that, subject to legislative appropriation, after the DOE has identified courses in the CCD, a school district or consortium of school districts may apply, in a format prescribed by the DOE, for funding to deliver or facilitate training for classroom teachers to earn an educator certificate in computer science or an industry certification associated with a course identified in the CCD. The funds must be awarded to school districts in a manner that allows equitable distribution of funding statewide based on the student population. The school district or consortium of school districts that apply for such funding may use the funds to:

- Provide training for classroom teachers, and
- Pay fees for examinations that lead to an educator certificate in computer science.

Such efforts may increase the number of teachers who possess a computer science credential or an applicable industry certification. In 2014-2015, the number of Florida teacher certificates in computer science was 593, which represented 0.15 percent of all certificates.³⁵

Teacher Bonus

The bill creates, subject to legislative appropriation, a bonus for educators who:

- Were evaluated as effective or highly effective in the prior school year, unless such teachers are newly hired and have not been evaluated.
- Teach a computer science course that meets the specified requirements at a public middle, high, or combination school.

In addition to meeting the specified criteria, the educators must:

- Hold an educator certificate in computer science or has passed the computer science subject are examination and holds an adjunct certificate to receive a bonus of \$1,000 after each year of teaching a specified computer course, for up to 3 years.
- Hold an industry certification associated with a course in the CCD to receive a bonus of \$500 after each year teaching the specified course, for up to 3 years.

The bill requires the school district to report qualifying classroom teachers to the DOE by a format established by the department. The bill requires the bonus to be disbursed upon completion of the school year in which the eligible classroom teacher taught the course. The bill clarifies that a teacher may not receive more than one type of bonus. Such bonus may provide incentive to teachers to seek a credential in computer science, industry certifications to teach computer science courses.

³⁵ Florida Department of Education, *Identification of Critical Teacher Shortage Areas*, <http://www.fldoe.org/core/fileparse.php/7766/urlt/CTSA1617.pdf>, at 4.

Support for Technology in the Classroom

Subject to legislative appropriation and as determined by the DOE, a school district is eligible to receive a high-need district technology grant if the funds provided in the digital classrooms allocation are insufficient to meet the required costs and if the district has no remaining instructional materials funds.³⁶ The bill requires the DOE to establish an application process and eligibility criteria for the high-need district technology grants. The DOE must provide such grants based on a school district's technology needs, but must also consider an equitable distribution of funding based on geographic distribution of the student population among the districts determined to have a high need for technology. The additional funding may help school districts in providing students access to computer science courses taught by qualified teachers.

The bill requires the State Board of Education to adopt rules to administer the provisions related to computer science and technology instruction.

The bill takes effect upon becoming a law.

IV. Constitutional Issues:

A. Municipality/County Mandates Restrictions:

None.

B. Public Records/Open Meetings Issues:

None.

C. Trust Funds Restrictions:

None.

V. Fiscal Impact Statement:

A. Tax/Fee Issues:

None.

B. Private Sector Impact:

The bill may impact certain teachers. Specifically, the bill:

- Provides a bonus, for up to 3 years, to a public school educator of:
 - \$1,000 if the educator holds an educator certificate in computer science or an adjunct certificate, and meets other specified criteria.

³⁶ Each school district receives an allocation for instructional materials for students in grades K-12, which provides for growth and maintenance needs. Section 1011.67(1), F.S. In 2017-2018, the Legislature appropriated \$230,743,258 for instructional materials, of which \$165,000,000 was specified for school district purchases of instructional content, as well as electronic devices and technology equipment and infrastructure. Specific appropriations 7 and 91, ch. 2017-18, L.O.F.

- \$500 if the educator holds an applicable industry certification, and meets other specified criteria.

C. **Government Sector Impact:**

The total cost to provide a bonus to teachers who hold a certificate in computer science or applicable industry certifications is currently indeterminate. According to the Department of Education (DOE), approximately 460 teachers hold a state-issued computer science teaching certificate. If each of these teachers received the bonus authorized under this bill, the estimated cost would be \$1,380,000. The DOE does not collect industry certification data at the teacher level. Therefore, the cost of those bonuses is indeterminate.³⁷

VI. **Technical Deficiencies:**

None.

VII. **Related Issues:**

None.

VIII. **Statutes Affected:**

This bill substantially amends 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.)

Recommended CS/CS by the Appropriations Subcommittee on Pre-K-12 Education on February 8, 2018:

The committee substitute requires the State Board of Education to develop rules so that additional computer science courses may be identified in the Course Code Directory and posted on the Department of Education’s website.

CS by Education on January 16, 2018:

The committee substitute:

- Shifts the focus of the bill from computer coding courses to computer science courses;
- Makes adjustments to teacher bonus amounts and disbursements;
- Makes adjustments to the award of high-need technology grants to school districts (based on whether digital classroom funds or instructional materials funds are insufficient to meet the costs), and
- Removes from the bill the \$15 million appropriation.

³⁷ Florida Department of Education, *2018 Legislative Bill Analysis for SB 1056* (Dec. 11, 2017), at 5 and 6.

B. Amendments:

None.

This Senate Bill Analysis does not reflect the intent or official position of the bill's introducer or the Florida Senate.
