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:	SB 1344
INTRODUCER:	Senator Calatayud
SUBJECT:	Computer Science Education
DATE:	January 22, 2024 REVISED:

	ANALYST	STAFF DIRECTOR	REFERENCE		ACTION
1.	Jahnke	Bouck	ED		**Pre-meeting**
2.			AED		
3.			FP		

I.   Summary:

SB 1344 modifies requirements for the delivery of computer science instruction in K-12 public schools and expands eligibility for bonuses related to providing computer science instruction. Specifically, the bill:

- Requires elementary and middle schools, beginning in the 2025-2026 school year, to provide computer science instruction to develop in students a foundation for future computer usage and achieving digital literacy.
- Requires high schools and public charter high schools to offer at least one computer science course that satisfies the requirements for a student to obtain a standard high school diploma.
- Expands to certified school counselors, social workers, career specialists, school psychologists, librarians, media specialists, and all elementary school instructional personnel the eligibility for funding and bonuses related to computer science instruction.

The bill requires the Department of Education (DOE) to adopt and publish a strategic plan for a statewide computer science education program

Additionally, the bill establishes the AI in Education Task Force within the DOE to evaluate the potential applications of artificial intelligence in K-12 and higher education and to develop policy recommendations.

The bill takes effect July 1, 2024.

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 fundamental 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 57.5 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 Jan. 18, 2024). Code.org, *More Data and Talking Points for Advocacy, Why study computer science,* https://code.org/promote/morestats (last visited Jan.18, 2024).

[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 (CCD).[17]

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

There are 72 middle and high school, as well as 2 elementary school, computer science courses currently identified in the CCD.[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

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[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 Jan. 19, 2024).

[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 2023-2024*, *available at* https://www.fldoe.org/core/fileparse.php/7746/urlt/2324CompSci.pdf.

[20] Section 1003.4282(1)(a), F.S.

approved by the State Board of Education (SBE) and identified in the CCD. 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 SBE 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 SBE 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

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[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 state academic standards for that subject. An applied course aligns with state academic 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(9), F.S.
[24] *Id.* and Section 1002.3105 F.S.
[25] Section 1003.4282(3), F.S.
[26] *Id.*
[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 SBE is required to adopt rules to administer the bonuses related to computer science instruction.[38]

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[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)(h), F.A.C.

[34] Section 1007.2616(4), F.S.

[35] Section 1007.2616(7), F.S.

[36] *Id.*

[37] *Id.*

[38] Section 1007.2616(8), F.S.

The appropriation to fund training for computer science and teacher bonuses for the fiscal year 2023-2024 is $10 million.[39]

Regulating Artificial Intelligence in Education

Federal Action

The recent surge in the use of generative artificial intelligence (AI) applications has prompted discussions about the role of this technology in the field of education. In fall 2022, the White House Office of Science and Technology announced[40] a series of steps to address the rise of AI-driven tools across a variety of sectors.[41] The United States Department of Education (USDOE) was charged with developing guidance and recommendations for the use of AI in teaching and learning. The USDOE published the report[42] in May 2023 with guidance and recommendations focused on the use of AI to:[43]

- leverage automation;
- support education systems, teachers, and classroom planning;
- interrogate data and examine inequities; and
- protect student privacy and assess student learning.

The report notes several desired national research and design (R&D) objectives, such as, "creating and studying effective programs for AI literacy for students, teachers and educational constituents in general, including literacy with regard to the ethics and equity issues specific to AI in educational settings."[44]

State Action

A few states are in the early stages of developing policies and guidance related to AI in education.[45] In January 2024, the North Carolina Department of Public Instruction became the fourth state education department to issue guidance to its schools on the use of AI technology.[46] Executive orders have been signed by the Governors in seven states to establish task forces to recommend or establish standards and policies regarding the use of AI in education.[47]

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[39] Specific Appropriation 95, ch. 2023-239, s. 2, Laws of Fla.

[40] The White House, *Fact Sheet: Biden-Harris Administration Announces Key Actions to Advance Tech Accountability and Protect the Rights of the American Public*, https://www.whitehouse.gov/ostp/news-updates/2022/10/04/fact-sheet-biden-harris-administration-announces-key-actions-to-advance-tech-accountability-and-protect-the-rights-of-the-american-public/ (last visited Jan. 18, 2024).

[41] Education Commission of the States, *State Information Request AI Regulation Policies* (Dec. 12 2023), *available at* https://www.ecs.org/wp-content/uploads/State-Information-Request_AI-Regulation-Policies.pdf.

[42] United States Department of Education, Office of Educational Technology, *Artificial Intelligence and the Future of Teaching and Learning: Insights and Recommendations* (May 2023), *available at* https://www2.ed.gov/documents/ai-report/ai-report.pdf.

[43] *Id*, at 5.

[44] *Id*, at 51.

[45] Education Commission of the States, *State Information Request AI Regulation Policies* (Dec. 12 2023), *available at* https://www.ecs.org/wp-content/uploads/State-Information-Request_AI-Regulation-Policies.pdf.

[46] EdNC, *N.C. DPI releases guidebook on the use of AI in schools*, https://www.ednc.org/n-c-dpi-releases-guidebook-on-the-use-of-ai-in-schools/ (last visited Jan. 18, 2024).

[47] Education Commission of the States, *State Information Request AI Regulation Policies* (Dec. 12 2023), *available at* https://www.ecs.org/wp-content/uploads/State-Information-Request_AI-Regulation-Policies.pdf.

III.   Effect of Proposed Changes:

SB 1344 modifies s. 1003.01, F.S., to provide definitions related to computer science instruction. Specifically, the bill defines:

- "Computational thinking" as the thought process involved in expressing solutions as computational steps or algorithms that can be carried out by a computer.
- "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, computational thinking, robotics, cybersecurity, artificial intelligence, machine learning, computer networking, and physical computing.

The bill modifies s. 1003.41, F.S., to add computer science skills to those topics that must be integrated in all curricular content for all subjects. The bill requires computer science standards to establish specific curricular content for, at a minimum, computer coding, computer programming, computational thinking, robotics, cybersecurity, artificial intelligence, machine learning, computer networking, and physical computing.

The bill creates s. 1003.4202, F.S., related to computer science instruction in K-12 public schools, which 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. This new section created in the bill:

- Requires elementary and middle schools, beginning in the 2025-2026 school year, to provide computer science instruction to develop in students a foundation for future computer usage and achieving digital literacy.
- Requires high schools, and clarifies the inclusion of public charter high schools, beginning in the 2025-2026 school year, to offer at least one computer science course that satisfies the requirements for a student to obtain a standard high school diploma.
- Updates the content of digital skills in elementary and middle school digital classrooms to include the more broadly defined computer science rather than coding.
- Requires computer science courses or instruction in computer science offered by a public school or public charter high school to:
  - Be of high quality, as defined by the State Board of Education (SBE).
  - Meet or exceed the standards and curriculum requirements established by the SBE.
  - At the high school level, be aligned with content required for, or that support progress toward, computer science-related industry certifications.
- Expands the courses identified by the Department of Education (DOE) in the Course Code Directory and published on its website to include:
  - Computer science courses and computer science industry certifications identified as eligible for meeting requirements for a standard high school diploma.
  - Computer science courses that meet Scholar designation requirements for mathematics, science, and electives.
- Removes, from the funds authorized for training or payment of exam fees related to computer science credentials or professional development, the requirement for the DOE to award funding in an equitable manner that accounts for the unique needs of small or rural school districts.

- Extends the eligibility for funding and bonuses related to computer science instruction to all instructional personnel at all levels, not limited to middle and high school classroom teachers.
- Authorizes any unexpended balance of funds appropriated for computer science instruction training and bonuses to be carried forward for up to five years after the effective date of the original appropriation.

The bill requires the DOE to adopt and publish a strategic plan for a statewide computer science education program by October 31, 2025, which must include, at a minimum, all of the following:
- A statement of purpose describing the objectives or goals the DOE will accomplish by implementing a computer science education program, the strategies by which those goals will be achieved, and a timeline for achieving them.
- A summary of the current state landscape for K-12 computer science education, including the diversity of students taking these courses.
- A plan for expanding flexible options to license computer science teachers, which may include approval codes technical permits, ancillary licenses, and standard licenses.
- A plan for expanding computer science education opportunities to every school in the state by the timeline established within the statement of purpose.
- A plan for defining high-quality professional learning for teachers to begin teaching computer science.
- An ongoing evaluation process that is overseen by the DOE.
- Proposed rules that incorporate the principles of the strategic plan into the state's public education system as a whole.
- A recommended long-term plan for implementing a requirement that every K-12 public school and public charter school employ at least one certified or endorsed computer science teacher or one career and technical education teacher trained in computer science.
- A plan to ensure long-term sustainability.

Additionally, the bill establishes the AI in Education Task Force (task force) within the DOE, which must provide administrative support. The purpose of the task force is to:
- Evaluate the potential applications of artificial intelligence (AI) in K-12 and higher education.
- Develop policy recommendations for responsible and effective uses of AI by students and educators.
- Create a definition for the term "artificial intelligence".
- Identify workforce needs related to AI.
- Provide policy recommendations to ensure that the state develops education and workforce training programs that align with changing industry needs.

The bill establishes the Commissioner of Education as the chair of the task force. Other members of the task force must be appointed by the Governor by October 1, 2024, as follows:
- A representative from the SBE;
- A representative from the Board of Governors of the State University System;
- A representative from the Division of State Purchasing within the Department of Management Services with expertise in technology procurement and data privacy standards;
- A representative from the Office of the Attorney General;

- One school board member and one district school superintendent, each representing a rural school district, a suburban school district, and an urban school district, respectively;
- A school district educational technology director;
- Faculty in this state with expertise on AI, educational technology, or ethics from a public college, a private college, and a community or technical college, respectively;
- Educators from one public school, one public charter school, and one private school in this state; and
- Leaders from three industry sectors in this state directly affected by developments in AI.

The bill requires the task force to meet at least four times per year beginning January 1, 2025, and to complete its work within one year. Upon completion, the task force must submit recommendations to the Governor, the President of the Senate, and the Speaker of the House of Representatives. The bill specifies that all meetings must be open to the public.

The bill requires the task force to do all of the following:
- Evaluate the current state of AI technology and its potential applications in K-12 and higher education.
- Assess the ethical, legal, and data privacy implications of AI usage in education.

The bill requires the SBE to adopt rules regarding the computer science provisions created in the bill. The bill also includes a number of conforming cross-references related to definitions in public K-12 education.

The bill is effective July 1, 2024.

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 2023-2024 is $10 million.[48]

VI.   **Technical Deficiencies:**

None.

VII.   **Related Issues:**

None.

VIII.   **Statutes Affected:**

This bill substantially amends the following sections of the Florida Statutes: 11.45, 39.0016,
327.371, 414.1251, 553.865, 1001.11, 1002.01, 1002.20, 1002.3105, 1002.33, 1002.394,
1002.395, 1002.42, 1002.43, 1002.44, 1003.01, 1003.03, 1003.21, 1003.26, 1003.41, 1003.52,
1003.573, 1003.575, 1006.0626, 1006.07, 1008.24, and 1012.2315.
This bill creates section 1003.4202 of the Florida Statutes.
This bill repeals section 1007.2616 of the Florida Statutes.

IX.   **Additional Information:**

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

None.

B.   Amendments:

None.

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

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[48] Ch. 2023-239, s. 2, Specific Appropriation 95, Laws of Fla.