Date of Hearing: April 9, 2025

ASSEMBLY COMMITTEE ON EDUCATION
Al Muratsuchi, Chair
AB 811 (Ahrens) – As Amended March 18, 2025

SUBJECT: Teacher credentialing: computer science instruction: workgroup

SUMMARY: Changes the dates by which the Commission on Teacher Credentialing (CTC) is required, contingent upon an appropriation, to convene a workgroup on credentialing for instruction in computer science to report its findings. Specifically, **this bill**:

1) Requires that the CTC convene a workgroup on credentialing for instruction in computer science by July 1, 2026, instead of July 1, 2024.

2) Requires that the workgroup report its findings and recommendations by July 1, 2027, instead of July 1, 2025.

3) Repeals the provisions of the act by January 1, 2030, instead of January 1, 2028.

EXISTING LAW:

1) Authorizes the CTC to issue single subject teaching credentials in agriculture, art, biological sciences, business, chemistry, dance, English, geosciences, health science, home economics, industrial and technology education (ITE), mathematics, music, physics, physical education, science (various subjects), social science, theater, and world languages (English language development and languages other than English). (Education Code (EC) 44257)

2) Through regulation, authorizes holders of credentials in mathematics, business, and ITE, as well as holders of supplementary authorizations in computer science, to teach computer science. (California Code of Regulations, Title 5, Section 80005)

3) Authorizes the CTC to issue a multiple or single subject teaching credential with a specified concentration in a particular subject based upon the depth of an applicant's preparation in an important subject of the school curriculum in order to ensure excellence in teaching in specific subjects. (EC 44225)

4) Authorizes the CTC to issue credentials for teaching specialties, including bilingual education, early childhood education, and special education (education specialist). Requires education specialist teaching credentials to be based upon a baccalaureate degree from an accredited institution, completion of a program of professional preparation, and standards that the CTC may establish. (EC 44265)

5) Requires the CTC, on or before July 1, 2024, to convene a workgroup on credentialing for instruction in computer science to do all of the following:

    a) Determine which single subject teaching credentials or designated subjects career technical education teaching credentials, if any, should also authorize teaching computer science;

b) Determine whether a single subject teaching credential in computer science should be established; and

c) Make recommendations on strategies to meet the workforce demands associated with expanding access to computer science instruction to all pupils.

6) Requires that at least one-half of the workgroup be composed of current classroom teachers with experience teaching computer science at the secondary level and that the workgroup also include representatives from:

a) School administration; and

b) Institutions of higher education involved in the preparation of teachers to teach computer science. (EC 44257.5)

7) Requires the Superintendent of Public Instruction (SPI) to convene a computer science strategic implementation advisory panel (panel) to develop recommendations for a computer science strategic implementation plan, and requires the panel to submit recommendations for a strategic plan to the State Board of Education (SBE) by January 15, 2019. Requires the plan to include, at a minimum, recommendations on all of the following:

a) Broadening the pool of teachers to teach computer science;

b) Defining computer science education principles that meet the needs of students in all grades; and

c) Ensuring that all students have access to quality computer science courses.

8) Requires the Instructional Quality Commission (IQC) to consider developing and recommending to the SBE, on or before July 31, 2019, computer science content standards for kindergarten and grades 1 to 12 pursuant to recommendations developed by a group of computer science experts. (EC 60604)

9) States that if a school district requires more than two courses in mathematics for graduation from high school, the district may award a student up to one mathematics course credit for successfully completing a "category C" approved computer science course. (EC 51225.35)

10) Requires the California State University (CSU), and requests the University of California (UC), to develop guidelines for high school computer science courses that may be approved for the purposes of recognition for admission. (EC 66205.5)

11) Establishes the Computer Science Supplementary Authorization Incentive Grant Program for the purpose of providing one-time grants to local educational agencies (LEAs) to support the preparation of credentialed teachers to earn a supplementary authorization in computer science and provide instruction in computer science coursework.

12) States that participating teachers are eligible to receive an award of up top $2,500 through the program. Authorizes LEAs to use grant funding for the purpose of paying teachers' costs of coursework, books, fees, and tuition, as applicable. Requires applicants for the program to

provide a 100% match of grant funding, which may be in the form of release time or substitute teacher costs.

FISCAL EFFECT: Unknown

COMMENTS:

Need for the bill. According to the author, "Expanding the number of teachers qualified to teach computer science is vital to closing the equity gaps in education. Every student deserves access to high-quality computer science instruction, regardless of where they come from or their challenges. Assembly Bill 811 recognizes this need by giving the California Commission on Teacher Credentialing (CTC) more time to develop recommendations thoughtfully. This will help the state meet the workforce demands created by its important efforts to ensure that all students can benefit from computer science education. We can create a more inclusive and equitable learning environment for all."

Computer science credentialing workgroup was not convened due to lack of appropriation. Current law requires the CTC, on or before July 1, 2024, to convene a workgroup on credentialing for instruction in computer science to:

- Determine which single subject teaching credentials or designated subjects career technical education teaching credentials, if any, should also authorize teaching computer science;

- Determine whether a single subject teaching credential in computer science should be established; and

- Make recommendations on strategies to meet the workforce demands associated with expanding access to computer science instruction to all pupils.

This requirement was contingent upon an appropriation, which was never made. As a result, the workgroup was not convened. This bill extends the dates by which the workgroup would be convened and report its findings and recommendations by two years.

Who is authorized to teach computer science in California? California has three single subject teaching credentials (mathematics, business, and ITE) which authorize teachers to provide instruction in computer science. The CTC issues supplementary authorizations in computer science which also authorize a teacher holding another credential to teach computer science.

In 2016 the CTC modified their Computer Concepts and Applications authorization to reflect a change in focus from teaching basic computer use, keyboarding, and software application to broader preparation in computer science education. The CTC also changed the name of the authorization to "Computer Science."

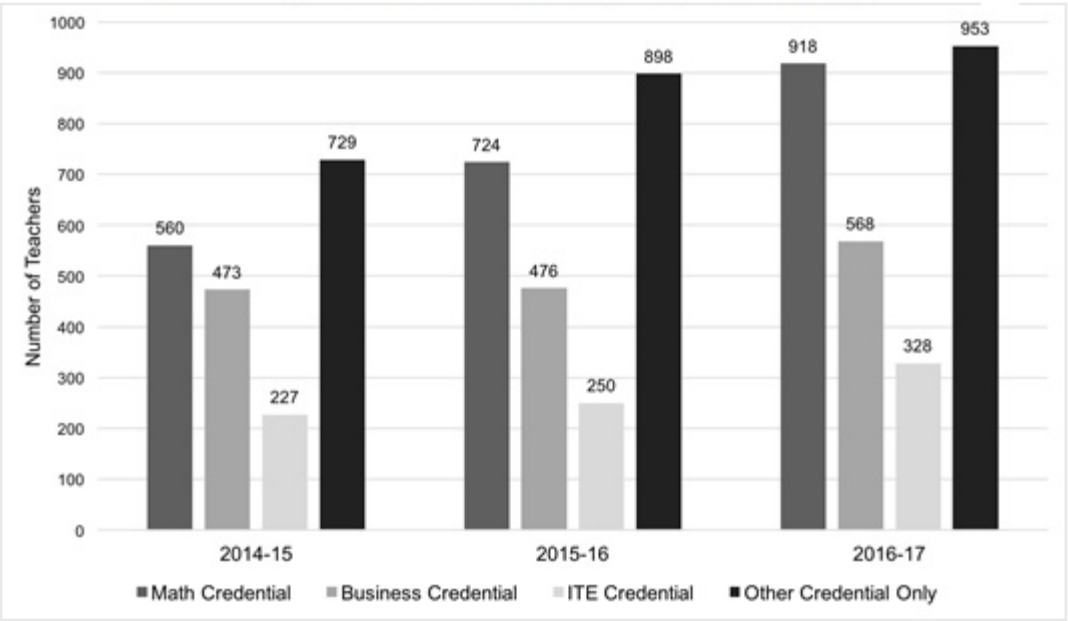
To obtain a supplementary authorization in computer science, teachers must complete 20 semester units or 10 upper division semester units, or the equivalent quarter units, of non-remedial course work in computer science. They may also qualify by holding a collegiate major from a regionally accredited college or university in a subject directly related to the subject to be listed on the credential. The coursework must cover the following content areas:

- Computer Programming
- Data structures and algorithms
- Digital devices, systems and networks
- Software design
- Impacts of computing

The balance of the units may be in any course that falls within the academic department for that subject category.

Computer Science Strategic Implementation Panel recommends that the state increase the number of supplementary authorizations in computer science. Current law requires the Superintendent of Public Instruction (SPI) to convene a computer science strategic implementation advisory panel to develop recommendations for a computer science strategic implementation plan, and requires the panel to submit recommendations for a strategic plan to the SBE by January 15, 2019. In September, 2018, the panel submitted a draft strategic plan (draft plan) to the SBE for consideration, and the SBE adopted the California Computer Science Strategic Implementation Plan in May, 2019, which establishes a vision statement: "California's vision is to ensure that all students develop foundational knowledge and skills in computer science to prepare them for college, careers, and civic engagement."

Teachers of computer science courses, by authorizing credential, 2016-17 (Source: CS Strategic Implementation Panel)



The plan states that "to grow K–12 computer science education in California, the state will need to increase the number of teachers qualified to teach computer science. Supporting more educators to teach computer science would involve a multi-pronged approach that attends to credentialing, new teacher recruitment, professional learning for teachers, administrators, and counselors regarding the California computer science standards, and institutional and financial support." The plan outlines several strategies for improving the availability of computer science instruction, including that a grant program could be established to support teachers to complete coursework for the computer science supplementary authorization, with additional incentives for teachers who work in low-income and underserved school districts and rural and urban school districts.

Who currently teaches computer science in California? According to the draft computer science strategic implementation plan, in the 2016-2017 academic year, approximately 2,273 teachers in California taught core academic computer science courses. This number grew steadily from 1,609 teachers in 2014-15 and 1,996 teachers in 2015-16.

As shown in the graphon the previous page, most teachers teaching computer science courses are credentialed in subjects other than mathematics, business, or ITE and hold a supplementary authorization to teach computer science. Teachers credentialed in mathematics comprise the largest number of those authorized with a single subject credential to teach computer science.

The table below shows the issuance of supplementary authorizations in computer science issued by the CTC. The annual number issued has declined since the changes made to the authorization. The CTC notes that this is not an unduplicated count.

Authorization	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Computer Concepts and Applications	177	229	158	111	100	120	109								
Computer Science and Introductory Computer Science	-	-	-	-	-	-	11	35	40	61	88	85	114	158	183

No preservice credential programs in computer science in California. While there are programs to prepare teachers to earn the computer science supplementary authorization, there are no single subject computer science preparation programs. This is because there is no computer science credential to earn through such a program. Some content on computational thinking and computer science have been added to some preparation programs in other disciplines, such as math and science. Some universities have created programs for in-service teachers to satisfy the course requirements for the supplementary authorization in computer science.

Teachers currently authorized to teach computer science receive no training in computer science in their preparation programs. The draft computer science strategic implementation plan noted that "A major weakness of the existing situation is that single-subject credentialed teachers authorized to teach computer science (i.e., Math, Business, or ITE) do not have subject matter requirements that cover basic computer science content. Furthermore, they are not trained in pedagogical knowledge relevant to computer science, which is different from their core subject. The supplementary authorizations in computer science, on the other hand, do require courses that cover computer science content knowledge. Yet, there are very few opportunities for credentialed teachers to enroll in such programs and these teachers will not necessarily have had practice teaching in a computer science classroom."

What is the subject of computer science in grades K-12? Computer Science is a relatively new field of study for K-12 education. The Computer Science Strategic Implementation Panel's draft report notes that there is some confusion over what constitutes computer science instruction in K-12 schools: "computer science is often misconstrued with other technological terminology such as computer literacy, educational technology, digital citizenship, and information

technology. These areas focus more on the use of computing systems (e.g., learning to use word processing software). In contrast, computer science calls upon students to understand why and how computing technologies work, and then to build upon that conceptual knowledge by creating computational artifacts."

The state's new computer science standards, adopted in 2018, define computer science education as "the study of computers and algorithmic processes, including their principles, their hardware and software designs, their applications, and their impact on society." The core concepts in computer science instruction are:

- Computing systems
- Networks and Information systems
- Data and Analysis
- Algorithms and Programming
- Impacts of Computing

According to the International Society for Technology in Education's report, *ISTE Standards for Computer Science Education,* the field of computer science will continue to rapidly evolve in sometimes unpredictable ways, and as such, plans for teaching computer science will also need the flexibility to continuously adapt.

Computer Science Supplementary Authorization Incentive Grant Program not producing expected number of single subject computer science teachers. AB 130 (Committee on Budget), Chapter 44, Statutes of 2021, appropriated $15 million to the CTC for the Computer Science Supplementary Authorization Incentive Grant Program. LEAs receiving grants through this program can use these funds to support tuition, fees, books, and/or release time for participating teachers. A 100% match of grant funds is required, and grant funds may not be used for program administrative purposes.

The CTC reported in February 2024 that, for the 2022-23 fiscal year:

- As of February 2024, four competitive rounds of Request for Applications have been awarded, a total of 12 LEAs with funds up to $2,607,500 to support 1,043 participants.
- $12,392,500 in grant funds remains;
- For the 2022-23 fiscal year, grantees requested a total of 117 participant slots and enrolled 62 participants (52.99%);
- 92% of participants are teaching at an LEA with a high unduplicated student count (above 50%);
- On average, participants need 14.5 units to earn a Computer Science Supplementary Authorization;
- After one year in the grant program, 0% of participants had earned a Computer Science Supplementary Authorization; and
- 0% of participants exited the program early. All participants are expected to continue coursework during the 2023-24 fiscal year.

Computer Science Grants, per Round	Date	Total Grantees	Total Funding	Remaining Funds
Round 1	June 20, 2022	4	$955,000	$14,050,000
Round 2	December 6, 2022	3	$152,500	$13,892,500
Round 3	May 12, 2023	3	$787,500	$13,105,000
Round 4	December 15, 2023	2	$712,500	$12,392,500
Totals		**12**	**$2,607,500**	**$12,392,500**

Source: CTC, 2024

Participant Teaching Information	# of Participants (n= 62)	% of Participants* (n= 62)
Average Teacher Tenure	9.65 Years	N/A
Teaches at a Rural School	7	11.29%
Teaches at a School with a High Unduplicated Student Count	57	91.94%
Multiple Subject	41	67.21%
Single Subject, Biological Science	5	8.20%
Single Subject, English	4	6.56%
Single Subject, Mathematics	8	13.11%
Single Subject, Social Science	3	4.92%

Source: CTC, 2024

The CTC reports that, in the first year of program implementation, the two most common challenges in administering this program were creating and implementing a grant program management system (29%) and LEAs experiencing high staff turnover (29%). LEAs also reported the following factors hindering the success of the program:

- "The cost of instructors and materials - $2,500 per participant is not sufficient to cover materials and faculty, even with matching funds."
- "It takes large amounts of time to collaborate, communicate with employees, and compile and record data. These actions usually take place out of the traditional workday."
- "The teachers see it as if they do it [earn the supplementary authorization] then they will teach CS [Computer Science], as opposed to being able to integrate CS into the content they are already teaching."

Arguments in support. Project Lead the Way writes, "Every student deserves accessible, culturally relevant computer science education, to ensure that they are equipped with the knowledge, tools, and resources to successfully participate and thrive in modern society, yet just 7% of students today take a high school computer science course. One barrier to the state's work to expand access to computer science instruction has been the lack of a sufficient number of credentialed computer science teachers.

AB 811 takes an important step in addressing this shortage by providing the CTC additional time to convene a workgroup and explore how the state's current credentialing options can help address the state's computer science needs. This workgroup will provide the state with much-

needed strategies to meet the growing workforce demands associated with expanding access to computer science instruction for all students."

Related legislation. AB 1251 (Luz Rivas), Chapter 834, Statutes of 2023, establishes a workgroup to determine which single subject credentials should authorize the teaching of computer science, and to report recommendations to the Legislature.
AB 887 (Berman) of the 2025-26 Session is substantially similar to AB 2097 of the 2023-24 Session.

AB 2097 (Berman) of the 2023-24 Session was substantially similar to AB 1054 (Berman) of the 2023-24 Session. This bill was held in the Senate Appropriations Committee.

AB 1054 (Berman) of the 2023-24 Session would have required the governing board of each school district, and the governing body of each charter school maintaining any of grades 9 to 12, to, by January 1, 2025, adopt a plan at a regularly scheduled public meeting to offer at least one course in computer science education pursuant to a specified timeline, and to report data relating to computer science course taking, as specified. This bill was held in the Senate Appropriations Committee.

AB 1853 (Berman) of the 2021-22 Session would have established the Computer Science Preservice Teacher Grant Program, administered by the CTC to award competitive grants to institutions of higher education (IHEs) to develop or expand K–12 computer science and computational thinking coursework for individuals seeking specified teaching credentials. This bill was held in the Assembly Appropriations Committee.

AB 2187 (Luz Rivas) of the 2021-22 Session would have established a UC Subject Matter Project in computer science. This bill was held in the Assembly Appropriations Committee.

AB 130 (Committee on Budget), Chapter 44, Statutes of 2021, established the Computer Science Supplementary Authorization Incentive Grant Program for the purpose of providing one-time grants to LEAs to support the preparation of credentialed teachers to earn a supplementary authorization in computer science and provide instruction in computer science coursework.

AB 128 (Committee on Budget), Chapter 21, Statutes of 2021, appropriated $5 million on a one-time basis to establish the Educator Workforce Investment Grant: Computer Science, and required the CDE to select an institution of higher education or nonprofit organizations to provide professional learning for teachers and paraprofessionals statewide in strategies for providing high-quality instruction and computer science learning experiences aligned to the computer science content standards.

AB 498 (Quirk-Silva) of the 2021-22 Session was substantially similar to AB 1932 of the 2019-20 Session. This bill was amended into a different jurisdiction and held in the Senate Appropriations Committee.

AB 1410 (Quirk-Silva) of the 2019-2020 Session was substantially similar to AB 1932 of the 2019-20 Session. This bill was held in the Senate Appropriations Committee.

AB 1932 (Quirk-Silva) of the 2019-20 Session would have established the Computer Science Access Initiative, to improve students' access to instruction in computer science by increasing

the number of teachers who are authorized and trained to provide computer science instruction in California public schools. This bill was held in the Assembly Education Committee.

AB 2309 (Berman) of the 2019-20 Session would have required the Commission on Teacher Credentialing (CTC) to develop and implement a program to award competitive grants to postsecondary educational institutions for the development of preservice credential programs for individuals seeking a teaching credential, and the expansion of programs of study for single subject or multiple subject credentialed teachers seeking a supplementary authorization in computer science. This bill was held in the Assembly Education Committee.

AB 2274 (Berman) of the 2019-20 Session would have required the CDE to annually compile and post on its website a report on computer science courses, course enrollment, and teachers of computer science courses, for the 2019-20 school year and each subsequent school year. This bill was held in the Assembly Education Committee.

AB 1967 (Luz Rivas) of the 2019-20 Session would have established a UC Subject Matter Project in Computer Science. This bill was held in the Assembly Higher Education Committee.

AB 20 (Berman) of the 2019-20 Session would have established a Computer Science Coordinator position at the CDE. This bill was held in the Assembly Appropriations Committee.

AB 52 (Berman) of the 2019-20 Session would have required the computer science strategic implementation plan to be regularly updated. This bill was held in the Assembly Appropriations Committee.

AB 182 (Luz Rivas) of the 2019-20 Session would have required the CTC to establish a workgroup, comprised of certain members, to determine if the development of a single subject computer science credential is warranted and, if so, to consider requirements for that credential. This bill was held in the Assembly Appropriations Committee.

AB 1410 (Quirk-Silva and O'Donnell) of the 2019-20 Session would have established the Computer Science Access Initiative, to provide grants to LEAs for the purpose of increasing the number of teachers authorized and trained to instruct students in computer science. This bill was held in the Assembly Appropriations Committee.

SB 675 (Chang) of the 2019-20 Session would have enacted the Computer Occupations and Developing Education (CODE) Act, pursuant to which the SBE would administer a grant program promoting the teaching of computer science courses in the public secondary schools. This bill was held in the Senate Governmental Organization Committee.

AB 2329 (Bonilla), Chapter 693, Statutes of 2016, requires the SPI to convene a computer science strategic implementation advisory panel to develop recommendations for a computer science strategic implementation plan.

AB 2275 (Dababneh) of the 2015-16 Session would have authorized a person who holds a single subject teaching credential in business, industrial and technology education, mathematics, or science or a designated subjects career technical education teaching credential to teach courses in computer science to all students. This bill was held in the Assembly Education Committee.

AB 1539 (Hagman, 2014), Chapter 876, Statutes of 2014, requires the IQC to consider developing and recommending to the SBE, on or before July 31, 2019, computer science content standards for kindergarten and grades 1 to 12, pursuant to recommendations developed by a group of computer science experts.

AB 1764 (Olsen), Chapter 888, Statutes of 2014, states that if a school district requires more than two courses in mathematics for graduation from high school, the district may award a student up to one mathematics course credit.

REGISTERED SUPPORT / OPPOSITION:

Support

California High School District Coalition
CodeHS
Processing Foundation
Project Lead the Way
SNAP INC. Institute for Technology & Education - California State University Dominguez Hills

Opposition

None on file

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