Date of Hearing: April 25, 2018

ASSEMBLY COMMITTEE ON EDUCATION
Patrick O'Donnell, Chair
AB 2098 (McCarty) – As Amended April 17, 2018

SUBJECT: After school programs: computer coding: grant program

SUMMARY: Establishes a grant program to support computer coding initiatives in specified afterschool programs and expresses findings and declarations of the importance of computer science education, labor market demands, and the need to close the digital divide. Specifically, **this bill**:

1) Expresses findings and declarations as follows:

    a) Computer science drives job growth and innovation throughout California's economy and society. Computing occupations are the number one source of all new wages in the United States and make up more than one-half of all projected new jobs in science, technology, engineering, and mathematics (STEM) fields, making computer science one of the most in-demand college degrees.

    b) Computer programming or coding is the tool used to power creation and innovation in the digital world. It provides foundational knowledge that all pupils need in the 21st century workplace.

    c) California leads the nation in technology jobs, innovation, and average wage for technology workers. In 2015-16, California had 1.2 million technology jobs but only had 4,029 computer science graduates.

    d) It is critical to close the digital divide in California. There remains a large disparity between pupils from affluent schools and pupils from low-income schools with access to coding courses. Schools with the highest percentage of low-income pupils offer computer science or coding courses at a rate less than one-half of that of schools with the lowest percentage of low-income pupils.

    e) The After School Education and Safety Program (ASES) serves more than 400,000 of the lowest-income pupils in the state. More than 80 percent of ASES participants are eligible for free or reduced-price meals, 35 percent are English learners, and 79 percent are underrepresented minority pupils.

    f) The After School Kids Code Grant Pilot Program provides critically needed exposure to coding for after school youth who are the least likely to learn to code in school or at home. The program is intended to inspire pupils to pursue STEM education and develop a growth mindset for learning.

2) Subject to an appropriation for this purpose, establishes the After School Kids Code Grant Program to be administered by the California Department of Education (CDE).

3) Requires the CDE to provide one-time grant funds to eligible ASES programs that focus on computer coding as part of their program curriculum.

4) Requires that the one-time grant funds be allocated and expended for the 2019-20, 2020-21, and 2021-22 fiscal years, as determined by the CDE.

5) Requires the CDE, in consultation with interested stakeholders, to develop an application process and criteria for determining eligible grant recipients consistent with the purpose of promoting computer coding education.

6) Requires that priority for grants under this program be given to applicants demonstrating:

    a) A high-quality coding curriculum and a commitment to provide instructional training to coding instructors utilizing a train-the-trainer model.

    b) A plan for sustaining the program beyond the three-year pilot program.

    c) A program that inspires pupils to consider STEM education and careers and emphasizes a growth mindset as a key to success in the 21st century digital world.

    d) A program that incorporates a college and career component that includes information about growing STEM opportunities in education and careers, and STEM internships and field trips that expose youth to STEM college opportunities and careers.

    e) A program that incorporates introductory digital literacy and responsible use of technology into its program curriculum.

7) Authorizes the CDE to impose conditions on grant recipients regarding the use of grant funds consistent with this section.

8) Requires the CDE to determine the amount and number of grants to be awarded under the program based on the after school program site enrollment and in consideration of the overall funding appropriated for this grant program in the 2018-19 Budget Act or other statute.

9) Specifies that these provisions sunset on January 1, 2023.

EXISTING LAW:

1) Establishes the ASES program through the 2002 voter approved initiative, Proposition 49. The ASES program funds the establishment of local before and after school education and enrichment programs, which are created through partnerships between schools and local community resources to provide literacy, academic enrichment and safe constructive alternatives for students in kindergarten through ninth grade (EC 8482).

2) Specifies that priority for funding ASES programs must be given to schools where a minimum of 50 percent of the pupils in elementary schools and 50 percent of the pupils in middle and junior high schools are eligible for free or reduced cost meals. Also specifies that every ASES program be planned through a collaborative process that includes parents, youth, and representatives of participating public schools, governmental agencies, such as city and county parks and recreation departments, local law enforcement, community organizations, and the private sector (EC 8482.5).

3) 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.

FISCAL EFFECT: Unknown.

COMMENTS: ***Need for the bill.*** According to the author:

> "California's economy is dependent on a dynamic workforce with the skills necessary to compete in the global economy. There are currently more than 500,000 computing jobs in the United States that require some form of computer programming skills. Yet in 2017, only 43,000 students graduated college with a degree in computer science. While the demand for computer science professionals is tremendous, there continues to be a shortage of trained workers with the necessary skills to perform these jobs.
>
> In addition to the skills gap, there remains a large disparity between students from affluent schools and students from low income schools with access to coding courses. Schools with the highest percentage of low-income students offer computer science courses at a rate less than half that of schools with the lowest percentage of low income students.
>
> The tech industry also has an issue with diversity. Over the past 10 years women in the technology sector have been underrepresented. Women make up about 48.7% of the general workforce, but represent only 22% of the technology workforce. Furthermore, underrepresented minorities have had modest gains at best in the tech industry. For example, the percentage of black and Hispanic workers in the tech industry has largely remained unchanged over the past 10 years.
>
> The California Department of Education (CDE) currently administers the After School Education and Safety (ASES) Program. This program serves over 400,000 students annually, at approximately 4,000 sites, the majority being California's most vulnerable students. Over 80% of ASES participants are eligible for free or reduced lunch, 35% are English language learners, and 79% are underrepresented minority students. The ASES program serves students and families across California by providing supervised after school academic and cultural enrichment. However, ASES does not currently offer a coding curriculum as part of its program.
>
> By providing coding opportunities to ASES participants California may address the diversity issue in the technology sector over the long term. Giving ASES Program participants the opportunity to learn coding will introduce these underserved students to these high paying jobs that our economy increasingly depends on."

The After School Education and Safety (ASES) Program is the result of the 2002 voter-approved initiative, Proposition 49. The ASES Program funds the establishment of local after school education and enrichment programs. These programs are created through partnerships between schools and local community resources to provide literacy, academic enrichment and safe constructive alternatives for students in kindergarten through ninth grade. Funding is designed to maintain existing before and after school program funding and provides eligibility to all elementary and middle schools that submit quality applications throughout California. The current funding level for the ASES program is $550 million or $8.16 per student per day.

The ASES program involves collaboration among parents, youth, representatives from schools and governmental agencies, such as local law enforcement and local parks and recreation departments, and individuals from community-based organizations and the private sector. Programs are created through partnerships between schools and local community resources to provide literacy, academic enrichment, and safe, constructive alternatives for students in grades K-9.

After school programs must consist of the two elements below and ASES program leaders work closely with school site principals and staff to integrate both elements with the school's curriculum, instruction, and learning support activities.

- An educational and literacy element must provide tutoring and/or homework assistance designed to help students meet state standards in one or more of the following core academic subjects: reading/language arts, mathematics, history and social studies, or science. A broad range of activities may be implemented based on local student needs and interests.

- The educational enrichment element must offer an array of additional services, programs, and activities that reinforce and complement the school's academic program. Educational enrichment may include but is not limited to, positive youth development strategies, recreation and prevention activities. Such activities might involve the visual and performing arts, music, physical activity, health/nutrition promotion, and general recreation; career awareness and work preparation activities; community service-learning; and other youth development activities based on student needs and interests. Enrichment activities may be designed to enhance the core curriculum.

According to a 2016-17 report, "*State of the State of Expanded Learning in California*" by the California After-School Network, California has the largest expanded learning infrastructure in the nation. These programs support after school, summer, inter-session and before school programs at over 4,500 sites serving nearly 860,000 children annually with a daily capacity of 485,000. These programs offer a range of supports and resources for underserved communities, which include year-round learning opportunities, STEM learning, nutrition education, increased physical activity, and social and emotional learning.

Growing need for computer science education. According to the U.S. Bureau of Labor Statistics, it is predicted that by the year 2020, 4.6 million jobs will be in computing or information technology, which is more than all other science, technology, engineering, and mathematics (STEM) fields combined. A report by CompTIA, *Cyberstates 2017,* estimates that in 2016, 1.2 million jobs in California were in the tech industry, while there were over one million tech occupation jobs, of which 47% were in the tech industry. This highlights the broad reach of technology-based employment opportunities. The report highlights the leading tech occupations in California:

- Software developer, applications: 136,590 jobs

- Software developers, systems software: 88,990 jobs

- Computer systems analysts: 79,980 jobs

The report also notes that the average tech industry wage of $154,000 was 148 percent higher than the average state wage of $62,000 in 2016.

According to a report by the Education Commission of the States, and other, *State Level Policies Supporting Equitable K-12 Computer Science Education,* there are several key reasons behind the push to ensure that all of today's students develop these competencies:

- Computer knowledge and skills are increasingly being recognized as foundational for an educated citizenry.

- Computer science is a central component of innovation, economic growth, and employment.

- The current homogeneity of the computer science workforce constrains opportunity and growth at the individual, state, and national levels.

According to a recent Gallup poll, 90 percent of parents want their child to study computer science but only 40 percent of schools teach computer programming. In light of this demand, policymakers, business leaders, and educators have made a conscious effort to expand computer science education in recent years in California and across the nation.

Barriers to computer science education. According to the Computer Science Teachers Association, "Roughly two-thirds of the fifty states do not have computer science standards for secondary school education. Even when they exist, computer science standards at the K-8 level often confuse computer science and the use of applications." These gaps could pose barriers to the scaling up of computer science education. Approximately 10 percent of schools nationwide offer computer science classes, and few large, urban school districts provide comprehensive computer science education to their students from pre-K to 12.

According to the Computer Science Teachers Association, a significant barrier is the shortage of adults who can teach computer science at a rich and rigorous level. In a 2013 survey of computer science teachers, the Association found that 40 percent of those said the greatest challenge in teaching computer science is a lack of support or interest from school staff. Another 35 percent said a lack of student interest or enrollment was the greatest challenge. Rapidly changing technology and a lack of curriculum resources were cited as the greatest challenge by 31 percent and 24 percent of teachers, respectively.

Schools may be discouraged from scheduling computer science courses for financial and logistical reasons. Challenges include finding time in packed school day and packed student schedules, and making sure school districts have the wiring, hardware and software needed to teach a computer science course. Because computer science courses are often designed for smaller class sizes – about 20 students as opposed to 35 students – schools might view them as expensive to offer.

Underrepresented minorities in computer science education. According to Code.org, The College Board last fall introduced a new course and exam called Advanced Placement (AP) Computer Science Principles. While the existing AP Computer Science course focuses on the Java programming language, the new course is billed as a creative exploration of real-world

problems. It's designed to appeal to people who might have assumed that computers were not for them.

From 2016 to 2017 the number of underrepresented minorities who took an AP Computer Science exam nearly tripled, from 8,283 to 22,199. The number of girls increased from 12,642 to 29,708. While significant, this increase was not sufficient for those two groups to reach parity. Only 1 in 5 of those taking AP Computer Science last year was an underrepresented minority student and about 1 in 4 were women.

Similar and prior legislation. AB 1744 (McCarty) of this session authorizes the California Department of Health Care Services (DHCS) to consider after school programs in allocating funds generated from an excise tax on the retail sale of cannabis for youth education, prevention and treatment efforts, and encourages schools offering specified afterschool programs to apply for these funds. This bill passed out of this committee and is pending before the Assembly Health Committee.

AB 2329 (Bonilla) Chapter 693, Statutes of 2016 establishes a computer science strategic implementation advisory board to develop a K-12 computer science strategic implementation plan.

AB 2237 (Olsen) of the 2015-16 Session would establish the Science, Technology, Engineering, and Mathematics Partnership Academies program, for the purposes of providing grants to school districts to establish up to 100 partnership academies dedicated to training students in STEM occupations. This bill was held in Assembly Appropriations.

AB 1258 (Chau) of the 2015-16 Session would have established a Computer Science Start-Up Courses Grant Pilot Program and a Computer Science Educator Training Grant Pilot program, for the purposes of providing grants to school districts to establish and maintain computer science courses and provide professional development for educators to teach computer science. This bill was held in Senate Appropriations Committee.

AB 1539 (Hagman), Chapter 876, Statutes of 2014, required 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.

REGISTERED SUPPORT / OPPOSITION:

Support

Computing Technology Industry Association
TechNet

Opposition

None on file

Analysis Prepared by: Debbie Look / ED. / (916) 319-2087