STATE OF HAWAIʻI
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI`I 96804

Date: 02/28/2018
Time: 10:45 AM
Location: 221
Committee: Senate Ways and Means

Department:	Education
Person Testifying:	Dr. Christina M. Kishimoto, Superintendent of Education
Title of Bill:	SB 2507, SD1 RELATING TO EDUCATION.
Purpose of Bill:	Requires the Department of Education to: (1) develop and implement a statewide computer science curricula plan for public schools; and (2) permit students to fulfill some graduation requirements through computer science coursework. Appropriates funds to the Department of Education. Requires the University of Hawaii to permit applicants to fulfill certain admission requirements through computer science coursework. (SD1)

Department's Position:
The Department of Education supports the intent of SB 2507, SD1.

Currently, the Department is developing a multi-year comprehensive computer science plan. This plan will identify K-12 curriculum, software, and technologies.

To ensure equitable and expanded access to computer science learning opportunities for K-12 students by 2022, the Department is addressing the following eight deliverables:

1) Adoption of Computer Science Standards aligned to national efforts,
2) Development of single courses and pathway courses for maximum student access,
3) Identification of standards-based curricular resources,
4) Quality K-12 professional development in computer science including fellowships and externships for teachers,
5) A schedule of academic competitions in partnership with business, industry and government,
6) Expansion of regional and school-based student demonstrations,
7) Increased partnerships for access to meaningful internship and apprentice models, and
8) Improved career counseling and information sharing around current and emerging computer science related work and study opportunities in Hawaii.

Respectfully, the Department offers comment on the following proposals in this measure:

Computer Science Standards (page 4, lines 6-11): The Department is in the process of gathering feedback from stakeholders to adopt K-12 Computer Science Standards aligned to national efforts.

State Leadership (page 4, lines 12-13): A state leadership team has been established to lead Computer Science (CS) efforts.

Teacher Certification (page 4, lines 14-15): The multi-year plan includes action items to clearly identify the teacher certification process.

High School Course Offerings (page 3, lines 5-8 and page 4, lines 16-18): The Department currently offers Computer Science courses at 21 high schools. If a CS course is not offered by a high school, online options are available for students. Additionally, students are able to earn a fourth Math or Science credit by satisfactorily completing a CS course and Algebra II. With these credits, students are eligible to earn an Academic Honors and/or STEM Honors designation.

Contracts for Professional Development (page 6, lines 1-21 and page 7, lines 1-11): The Department shall follow all procurement guidelines if professional development services are rendered from external agencies such as institutes of higher education and nationally recognized providers.

The Department defers comment to the University of Hawaii for admission requirements related to computer science coursework.

Thank you for this opportunity to provide testimony on SB 2507, SD1.

The Hawaii State Department of Education seeks to advance the goals of the Strategic Plan which is focused on student success, staff success, and successful systems of support. This is achieved through targeted work around three impact strategies: school design, student voice, and teacher collaboration. Detailed information is available at www.hawaiipublicschools.org.

Testimony Presented Before the
Senate Committee on Ways and Means
February 28, 2018 at 10:45 a.m.
By
Donald O. Straney
Vice President for Academic Planning and Policy
University of Hawai'i System

SB 2507 SD1 – RELATING TO EDUCATION

Chair Dela Cruz, Vice Chair Keith-Agaran, and members of the committee:

Thank you for the opportunity to comment on SB 2507 SD1 that requires the Hawai'i Department of Education to develop and implement a statewide computer science curricula plan for public schools and permits students to fulfill some graduation requirements through computer science coursework. SB 2507 SD1 requires the University of Hawai'i to permit applicants to fulfill certain admission requirements through computer science coursework.

The University of Hawai'i (UH) appreciates the efforts of the legislature to boost job growth and innovation in Hawai'i through the development of computer science education. UH defers to the Department of Education in matters of curricula planning for public schools, and offers these comments, pertaining only to Section 3 of SB 2507 SD1 (pages 7-8) which would amend Chapter 304A of the Hawai'i Revised Statutes by adding language on admission requirements to any University campus in 2022 or thereafter.

Specifically, this section states that the University of Hawai'i shall permit any applicant for admission to fulfill: a) one high school mathematics unit requirement by demonstrating that the applicant satisfactorily earned one computer science unit provided that the student also has fulfilled second-year algebra requirements; and b) one high school science unit requirement by demonstrating that the applicant satisfactorily earned one computer science unit, provided that the same computer science unit shall not fulfill more than one unit requirement.

While UH generally recognizes the need for strong science curricula, it does not seem that any change to the admissions requirements at UH is needed in order to support computer science, as stated in SB 2507 SD1. The admissions eligibility at the UH community colleges are to be 18 years of age or older and to have earned a high school diploma, GED, or equivalent. At UH four-year campuses, students seeking admissions could use a computer science course as one or more electives.

The UH does not support substituting computer science courses for the foundational science courses such as biology, chemistry, and physics, or mathematics. Instead, UH

encourages high school students to supplement this foundation with computer science courses, particularly students intending to go into the STEM fields, including information and communications technology (ICT).

Thank you very much for the opportunity to provide comments on SB 2507 SD1.

Microsoft

February 26, 2018

Senator Donovan M. Dela Cruz, Chair
Committee on Ways and Means

Re: Senate Bill 2507, SD1 Relating to Education
       Hearing: Wednesday, February 28, 2018 at 10:45 a.m.
       Conference Room: 211

Dear Chair Dela Cruz and Members of the Senate Committee on Ways and Means:

On behalf of Microsoft Corporation, we are writing in strong support for SB 2507, SD1, which if enacted, would greatly expand computer science education throughout the State and better equip Hawaii's students with the computing skills needed to thrive in the 21st century economy.

SB 2507, SD1 would make key improvements, including the development and implementation of statewide K-12 computer science curricula, permitting computer science courses to meet certain math and/or science graduation requirements, requiring the University of Hawaii to permit applicants to fulfill certain admission requirements through the completion of computer science coursework and by establishing a timeline to ensure that every public high school in the state offer at least one computer science course by the 2021-2022 school year. These changes will position the State to better prepare and strengthen the pipeline into many STEM and computing fields.

The importance of computer science to the economy of Hawaii and the United States cannot be overstated. Computing occupations are the number 1 source of all new wages across the country and make up more than two-thirds of all projected new jobs in the STEM fields. According to Code.org, there were 1,403 open computing jobs in the state of Hawaii, more than 4 times the average demand rate across the state, yet only 16 schools throughout the state offered an AP Computer Science course in the 2016-2017 school year. This bill will improve Hawaii students' ability to obtain the skills to flourish now and in the future.

Again, Microsoft is pleased to strongly support SB 2507, SD1 as it moves forward in the legislative process.

Sincerely,

Jonathan Noble   Allyson Knox
Director, Government Affairs   Director, Education Policy
Microsoft Corporation   Microsoft Corporation
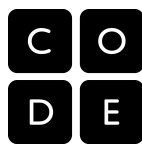
February 26, 2018

Re: SB 2507, SD 1, Strongly Support

Dear Committee Members,

Code.org and Women in Technology (Maui Economic Development Board) strongly support SB 2507, and recommend funding it at $500K this year. This bill allocates funding for computer science professional development for teachers, which is critical to ensuring that the state's schools have the capacity to offer courses in this subject. Further, the bill requests that the Department of Education develops a statewide computer science curricula plan and ensure that each public high school offers at least one computer science course in 2021-2022. The Department of Education has already established a team that is working to create opportunities for every K-12 student by 2022. Based on success in other states, we believe that this work, combined with the funding in the bill, will have immediate impact on access to high-quality computer science education.

Computing is a foundational skill for K-12 students. It develops students' computational and critical thinking skills and teaches them how to create—not just use—new technologies. Computer science is driving job growth and innovation in Hawaii and throughout the United States. More than half of projected jobs in STEM fields are in computing occupations, and computer science is one of the most in-demand degrees for new college graduates. According to the Conference Board, there are over 1,400 open computing jobs in the State of Hawaii, with an average salary salary of $80,734. The policies encouraged by this bill would better prepare Hawaii's students for high paying, in-demand careers.

Further, only 16 schools in Hawaii (that's only 19% of Hawaii schools with AP programs) even offer an AP Computer Science course. Out of 290 exams taken in AP Computer Science last year, only 32% of those were taken by female students, 43 exams were taken by Hispanic of Latino students, 1 exam was taken by a Black student, and 12 exams were taken by Native Hawaiian or Pacific Islander students. We know that students who have access to these courses early on are more likely to choose to take the subject later on. And we also know that students who live in rural or urban areas are less likely to have access to computer science courses. No teachers graduated from a university in Hawaii last year prepared to teach computer science. This is why immediate dedicated funding for preparing existing teachers to offer these courses is critical. Our calculations estimate $800,000 is needed to prepare one teacher in each school in the state (with the assumption that 25% of schools already have a teacher); we recommend $500,000 in funding for this year to make a strong step towards this goal.

Thank you for your efforts in providing young people in Hawaii the education they need to be successful upon leaving the K-12 system. Code.org and Women in Technology support SB 2507, which will position Hawaii as a national leader in K-12 computer science education.

If you have any questions, please contact Katie Hendrickson at Katie@code.org, Cameron Wilson at Cameron@code.org, or Isla Young at (808) 875-2307. Thank you for your consideration of this matter.

Sincerely,

Cameron Wilson
VP for Government Affairs
Code.org
www.code.org

Isla Young
Director K12-STEM Education
Women in Technology, MEDB
Kihei, Hawaii

www.medb.org
www.womenintechnology.com
www.stemworkshawaii.com

SENATE COMMITTEE ON WAYS AND MEANS
Senator Donovan M. Dela Cruz, Chair
Senator Gilbert S.C. Keith-Agaran, Vice Chair

Wednesday, February 28, 2018 at 10:45AM, Conference Room 221

In consideration of
SB2507 SD1, **Relating to Education**

We support the Computer Science curricula plan to develop and implement a statewide program for students in K-12, permit students to fulfill some graduation requirements through computer science coursework, appropriates funds to the Department of Education and requires the University of Hawaii to permit applicants to fulfill certain admission requirements through computer science coursework.

DevLeague (http://www.devleague.com/) is the premier technical boot camp in the Pacific designed to provide mentorship and training to motivated individuals seeking a career change. We design our own curriculum based on relevant industry standards, teach in-demand technical skills such as JavaScript Web Engineer, Cyber Security Professional, Big Data Analyst and Enterprise Software Developer to help our adult students onboard with career starts into the software industry.

For the last 3.5 years, we have taught real-world software programming to middle and high school students. We started off with private schools such as Punahou School, Mid-Pacific Institute, Maryknoll School and Hawaii Baptist Academy where we created and honed our curriculum. Today, we are in these Hawaii DOE public schools with the following day-time, for credit courses:

School	Course	Year
Waipahu High School	Web Development I	2016-2017
	Web Development II Capstone	2017-2018
	Cybersecurity	2017-2018
Kapolei Middle School	Web Development I	2017-2018
Kapolei High School	Cybersecurity	2017-2018
Roosevelt High School	Cybersecurity	2017-2018
Hawaii Technology Academy	Game Development I	2017 Fall
	Web Development I	2018 Spring
Campbell High School	Cybersecurity	2018 Spring

The private-public partnership funding for these DOE programs are paid for by the kind donations from Public School of Hawaii Foundation, Hawaii Children's Foundation and workforce training funds provided by Department of Labor and Industrial Relations

Workforce Division. These funds are designed to kick-start the DOE coding programs, establish curriculum, train teachers and build college and career pathways for students in industry-focused academy-based schools. It's a start.

In summer 2017, we held a two-week intensive educator training program where five DOE teachers learned hands-on web development so that they could design their own curriculum to take back into their classroom. The teacher from Hawaii Technology Academy then taught web development to a classroom of students and also taught two more teachers web development so they too could teach more students.

From February to May, 2018, we are currently conducting a two-month online educator training program where six DOE teachers are learning hands-on basics of bringing coding into the classroom. The educators learn computational thinking concepts, coding fundamentals, and tools allowing educators to gain understanding and build confidence. By the end of the program, educators will be able to effectively teach and implement coding into their curriculum, and equip their students with a "can do" growth mindset. We created the online educator training program to enable neighbor island participation. One participant is located in Lihue, Kauai.

The ask: $500,000 as recommended by Code.org. The biggest constraints now are more funding for schools and educator training in computer science. Now is the time to boldly invest in computer science at the K-12 level to build upon and continue the success of what we started so that every high school has a at least one computer science program and/or courses that fulfils the computer science credit. This serves multiple purposes:

- Exposes and engages students in STEM-related courses
- Fulfill graduation requirements through computer science coursework
- Enables college-bound students to fulfill a computer science credit
- Develops foundational skills for career-pathway students into IT apprenticeships and the entry-level technical workforce

Thank you for the opportunity to offer this testimony.

Mahalo!

Russel Cheng
Co-founder, Director

Purple Mai'a Foundation
98–820 Moanalua Road, #15-547
'Aiea, HI 96701
kokua@purplemaia.org

February 26, 2018

19th Hawai'i State Legislature

Subject: Support for SB 2507

Aloha e Legislators,

On behalf of Purple Mai'a Foundation, I am writing today in support of SB 2507 Relating to Education, a bill which would require computer science curricula in public schools, allow CS classes to count toward graduation credits and University of Hawai'i admission requirements, and would appropriate funding to the HIDOE to support the above changes.

Purple Mai'a is a nonprofit that has been working since 2013 to create access to empowering education in coding and computer science for Hawai'i's youth, especially those growing up in schools and communities where resources for CS learning are not available. We've seen first hand how Hawai'i's public schools are not preparing students with the lucrative skills and knowledges provided by computer science that are important today and will be more important in the future as technology plays a bigger role in our lives and economies. A statewide computer science curricula and counting CS toward graduation requirements are important first steps in making CS learning available to all students, no matter their background.

Implementing such a curricula statewide will teacher training and professional development. When I conducted an informal survey of Hawai'i teachers two years ago to learn about the problem of the lack of CS in schools, I found that the number one thing according to teachers that holds back CS in our schools is that teachers feel they don't have the knowledge or confidence to teach CS. We support the appropriation of at least $500,000 in funding for DOE teacher PD in CS.

Me ka ha'aha'a,

Donavan Kealoha
Co-Founder and Chief Staff, Purple Mai'a

February 28, 2018

Committee on Ways and Means
Senator Donovan M. Dela Cruz, Chair
Senator Gilbert S.C. Keith-Agaran, Vice Chair

State Capitol
415 South Beretania Street
Honolulu, HI 96813

Aloha Chair Dela Cruz, Vice Chair Keith-Agaran and Members of the Committee,

Founded in 2017, HawaiiKidsCAN is a nonprofit organization committed to ensuring that Hawaii has an excellent and equitable education system that reflects the true voices of our communities and, in turn, has a transformational impact on our children and our state. HawaiiKidsCAN is a branch of 50CAN: The 50-State Campaign for Achievement Now.

HawaiiKidsCAN is supporting SB 2507 SD 1 to advance the momentum for greater equity and access to computer science (CS) learning opportunities.

Our changing economy

- CS and other science, technology, engineering and math (STEM) knowledge will become increasingly important as our diverse economy evolves. Between 2017 and 2027, STEM-related occupations are projected to grow by 8 percent in Hawaii, compared with just 4 percent for all other occupations.[1] In particular, some of Hawaii's fasting growing occupations between 2014 and 2024 will require CS experience, including web development (26 percent growth), computer systems analysis (20 percent growth) and software development (18 percent growth).[2] These and other Hawaii STEM jobs carry a median hourly wage of $40.45, well over double the median hourly wage for all other jobs of $19.64.[3]

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[1] "ECS Vital Signs: STEM Demand Hawaii." *Education Commission of the States.* http://vitalsigns.ecs.org/state/Hawaii/demand

[2] Software development includes systems software and applications software. "Employment Projections for Industries and Occupations." August, 2016. *Hawaii Workforce Infonet.* https://www.hiwi.org/admin/gsipub/htmlarea/uploads/Long-TermProjections-2014-2024-State.pdf

[3] "ECS Vital Signs: STEM Demand Hawaii." *Education Commission of the States.* http://vitalsigns.ecs.org/state/Hawaii/demand

- These new skills are becoming increasingly important as our economy changes, with reports suggesting that automation may eliminate a third of our nation's jobs by 2030.[4] An initial investment in our students in these skills will be more than paid back as students become our workforce of tomorrow, ensuring that Hawaii is poised to not only survive this changing global economy, but thrive.

Our students need more access to CS opportunities

- To help meet the increasing demand for K-12 CS teachers, Hawaii should enable all high schools to offer computer science professional development to teachers. This is a critical step toward increasing K-12 CS capacity while preservice CS preparation programs are being developed for future educators. An initial allocation of $500,000 would enable each public school to train at least 1 existing teacher in computer science, creating the foundation for a robust computer science learning environment in Hawaii. This initial state investment in computer science could also be leveraged into public-private partnerships to further expand training access to additional teachers or around new innovations.

- Of the 14 public schools offering AP Computer Science courses, four received Title 1 funding in 2017-18, suggesting a shortage of courses available to low-income students.[5] Increasing access to these courses, especially for underrepresented communities, will provide students with additional opportunities to discover the CS field and help eliminate the gender- and ethnicity-based inequities seen in the CS workforce.

- In addition to technical knowledge, the skills taught in CS courses can help students across a range of other school subjects, including math, science and the humanities.[6] As we look to close our persistent achievement gaps across our schools, we must continue to explore rigorous and relevant learning experiences for our diverse students.

Closing gender gaps

- Of the 290 AP CS test takers in Hawaii in 2017, only 32 percent were female, highlighting the gender inequity in K-12 CS classes. Though this is a 70 percent increase from 2016 and a whopping 557 percent increase from 2007, female participation on AP CS exams still pales in comparison to male participation.[7] Early exposure to CS can have a significant impact on eliminating the gender gap in the CS labor force. After participating

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4 "Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation." Manyika, J. et al. *McKinsey Global Institute*. December 2017. https://goo.gl/GLShNP

5 "Title I Eligibility Data by Complex Area for School Year 2017-2018." *Hawaii State Department of Education*. http://www.hawaiipublicschools.org/DOE percent20Forms/TitleI17-18.pdf

6 "Trends in the State of Computer Science in U.S. K-12 Schools". Google Inc. & Gallup Inc. 2016. *http://goo.gl/j291E0*

7 "AP Program Participation and Performance State Report 2017." *CollegeBoard*. https://research.collegeboard.org/programs/ap/data/participation/ap-2017

in a hands-on introduction to coding through an *Hour of Code* event, female students are 10 percent more likely to say they like CS.[8] Encouraging women to enroll in AP CS courses in high school can increase the likelihood that they will go on to major in CS in college.[9] Nationally, high school students who take AP CS are twice as likely to try computer science in college and 6 times more likely to major in CS than those who take non-AP CS in high school. Women who learn CS in high school are 10 times more likely to study it in college.[10]

- Data shows that women constitute just 26 percent of employees in computing jobs, and just 30, 15 and 10 percent of tech roles in major companies Google, Facebook and Twitter, respectively.[11] These numbers are especially troubling when we consider the value of diverse workplaces, from greater innovation[12] to more startup success.[13] Closing these gaps at the K-12 level is essential if we are to prevent them from occurring at the office.

The world around us is changing. We must embrace the challenge of providing our children with an education that keeps up with the world.

Mahalo,

David Miyashiro
Founding Executive Director
HawaiiKidsCAN

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[8] The Hour of Code: Impact on Attitudes Towards and Self-Efficacy with Computer Science." Phillips, Rachel and Benjamin Brooks. January, 2017. Code.org. https://code.org/files/HourOfCodeImpactStudy_Jan2017.pdf

[9] "AP Students in College: An Analysis of Five-Year Academic Careers" *College Board Research Report No. 2007-4.* Morgan, R. and John Kalric. http://research.collegeboard.org/sites/default/files/publications/2012/7/researchreport-2007-4-ap-students-college-analysis-five-year-academic-careers.pdf.

[10] "Anybody Can Learn." *Code.org. http://blog.code.org/post/143007230537/computer-science-the-impact-of-k-12-on-university*

[11] "The Stats On Women In Tech Are Actually Getting Worse." Peck, E. *Huffington Post.* December 6, 2017. https://www.huffingtonpost.com/2015/03/27/women-in-tech_n_6955940.html

[12] "Diversity in Business Really Does Boost Innovation, According to a New Study." *FastCompany.com.* January 12, 2018. https://goo.gl/V2Ba2f

[13] "Data Doesn't Lie: Tech Firms Need to Hire More Women to Succeed." Lacy, S. Wired.co.uk. December 27, 2017. http://www.wired.co.uk/article/sarah-lacy-gender-bias-silicon-valley

I am Jeselle Guillermo, a student at W.R. Farrington High School. Computer science is a subject that I had started learning this year. In order to learn computer science I must commute about 30 minutes on bus to get to class and I only get to learn about this twice a week. It would be much easier to have this course on campus avoid traveling and allow more time learning. I have younger friends and family members who I believe would enjoy learning how to create their own games and websites but don't have the opportunity or teachers to teach them. That is why I believe it would be reasonable to give $500,000 for teacher professional development.

I was given the chance to learn coding in 11th grade which puts me at a disadvantage to many people in the workforce with more years of experience. Computer science should be a course more exposed to students due the the growth in technology. By offering computer science courses in public school we are creating a better environment for ourselves and generations ahead.

SB-2507-SD-1
Submitted on: 2/27/2018 8:46:38 AM
Testimony for WAM on 2/28/2018 10:45:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Justin Delos Reyes	Individual	Support	No

Comments:

My name is Justin Delos Reyes and I am in support of bill SB2507! I am a Computer Science teacher at Campbell High School and believe the state needs to do more to address the apparent need of funding and support of Computer Science courses and accessibility for grades K-12. All anyone needs to do is reflect on the news and current career trends to see why this is a very important issue, from protecting your identity, your financial data, health data, education data, personal data, and even our democracy, to careers providing livable wages making $50K to $70K starting more than ever do we need Computer Scientist, Information Technologist, and CyberSecurity specialist. Hawaii is a unique place and we are at a crossroads where if done right we can provide a formidable work force in the CS fields providing livable wages to our own state citizens and doing our part to contribute to our national security. My Computer Science classes have been visited by decision makers in the DOE, business leaders, FBI, NSA, various branches of military personnel who have all been saying the same thing; what can we do to support, what can we do to get the word out, what can we do to get funding, what can we do? The need is now and it requires adequate support and funding please support bill SB2507 to provide Computer Science education and accessibility to all students in grades K-12!

SB-2507-SD-1

Submitted on: 2/27/2018 10:24:10 AM
Testimony for WAM on 2/28/2018 10:45:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Angus Raff-Tierney	Individual	Support	No

Comments:

I Strongly Support SB2507. The education system in Hawai'i is broken and this would be a small step to fixing it. The lack of appropriate funding and resources for public schools has created a system segregated by class and even race where anyone that can afford private or charter school pulls there kids out of public schools. By creating and improving a program to teach necessary computer technology skills to children, this bill is a small step towards addressing these issues.