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

Date: 03/19/2018
Time: 11:00 AM
Location: 211
Committee: Senate Ways and Means

Department:	Education
Person Testifying:	Dr. Christina M. Kishimoto, Superintendent of Education
Title of Bill:	HB 2607, HD1, SD1 RELATING TO EDUCATION.
Purpose of Bill:	Requires the Department of Education (DOE) to develop and implement a statewide computer science curricula plan for public school students in K-12 and ensure each public high school offers at least one computer science course each school year. Authorizes DOE to contract for computer science teacher development programs. Appropriates funds. Takes effect 7/1/2025. (SD1)

Department's Position:
The Department of Education supports the intent of HB 2607 HD1 SD1.

Currently, the Department is developing a multi-year comprehensive action 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:

High School Course Offerings (page 3, lines 16-20 and page 4, lines 1-3): 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 via the Department's E-School program.

Contracts for Professional Development (page 4, lines 4-20 and page 5, lines 1-15): 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.

Thank you for this opportunity to provide testimony on HB 2607 HD1 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.

Written Statement of
Robbie Melton
Executive Director & CEO
Hawaii Technology Development Corporation
before the
Senate Committee on Ways and Means
Monday, March 19, 2018
11:00 a.m.
State Capitol, Conference Room 211

In consideration of
HB2607, HD1, SD1
RELATING TO EDUCATION

Chair Dela Cruz, Vice Chair Keith-Agaran, and Members of the Committee on Ways and Means.

The Hawaii Technology Development Corporation (HTDC) **supports the intent of** HB2607, HD1, SD1 that requires the Department of Education (DOE) to develop and implement a statewide computer science curricula plan for public school students in K-12 and ensure each public high school offers at least one computer science course each school year.

As part of HTDC's vision to create 80,000 new innovation jobs in Hawaii earning $80,000 or more by 2030, HTDC supports initiatives aimed at expanding access to computer science education in the State.

HTDC defers to the Department on implementation of this measure. Thank you for the opportunity to offer these comments.
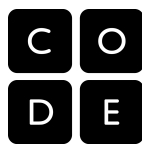
March 19, 2018

Re: HB 2607, HD 1, SD 1; Strongly Support

Dear Committee Members,

Code.org and Women in Technology (Maui Economic Development Board) strongly support HB 2607, HD 1, SD 1, 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 HB 2607, HD 1, SD 1, 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

Microsoft

March 15, 2018

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

Re: House Bill 2607, HD1, SD1 Relating to Education
       Hearing: Monday, March 19, 2018 at 11:00 a.m.
       Conference Room: 211

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

On behalf of Microsoft Corporation, I am writing in strong support for HB 2607, HD1, 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.

HB 2607, HD1, 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 HB 2607, HD1, SD1 as it moves forward in the legislative process.

Sincerely,

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

March 19, 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 HB 2607 HD1 SD1 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] In 2016, these and other computer and
  mathematical occupations carried a median hourly wage of $35.87 in Hawaii, nearly
  double the median hourly wage of $19.24 for all jobs that year.[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] "Occupational Employment and Wage Data - State of Hawaii 2016." August, 2017. Hawaii Workforce Infonet.
https://www.hiwi.org/admin/gsipub/htmlarea/uploads/OES_2016_publication.pdf

- 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

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. For more data on the importance of CS education in Hawaii, please see HawaiiKidsCAN's *State of Computer Science Education in Hawaii 2018* report at https://tinyurl.com/StateofCS.

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

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

Monday, March 19, 2018 at 11:00 AM, Conference Room 211

In consideration of **HB2607 HD1, SD1**, **Relating to Education**

We support the requirement for the Department of Education to develop and implement a statewide computer science curricula plan for public school students in K-12 and ensure each public high school offers at least one computer science course each school year, authorizes DOE to contract for computer science teacher development programs and appropriates funds for the program.

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
Kalani High School	Intro to Python Programming	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

HB-2607-SD-1
Submitted on: 3/16/2018 2:47:07 AM
Testimony for WAM on 3/19/2018 11:00:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Melodie Aduja	Testifying for OCC Legislative Priorities Committee, Democratic Party of Hawai'i	Support	No

Comments:

Good morning, my name is Melodie Aduja. I serve as Chair of the Oahu County Committee ("OCC") on Legislative Priorities of the Democratic Party of Hawaii. Thank you for the opportunity to provide written testimony on **HB2607 HD1 SD1** relating to DOE; Computer Science; and an appropriation.
The OCC Legislative Priorities Committee is in favor of **HB2607 HD1 SD1** and supports its passage.

HB2607 HD1 SD1, is in accord with the Platform of the Democratic Party of Hawai'i ("DPH"), 2016, as it requires the Department of Education (DOE) to develop and implement a statewide computer science curricula plan for public school students in K-12 and ensure each public high school offers at least one computer science course each school year; authorizes DOE to contract for computer science teacher development programs; and appropriates funds; effective 7/1/2025.
Specifically, the DPH Platform states, "[w]e recognize that the responsible use and development of technology in all its manifestations offers immense potential for our community, government, including institutions of higher education and business sectors. We encourage synergistic research, development, commercialization and educational programs to promote technological proficiency and innovation. In particular we support Science, Technology, Engineering and Math (STEM) initiatives in our public, private and charter schools as these prepare the next generation to address the needs of our state. We also support programs that facilitate incubator, i.e.start-up, opportunities for new and promising technologies, and encourage the local retention of our intellectual resources." (Platform of the DPH, P. 3, Lines 149-156 (2016)).

Given that **HB2607 HD1 SD1** requires the Department of Education (DOE) to develop and implement a statewide computer science curricula plan for public school students in K-12 and ensure each public high school offers at least one computer science course each school year; authorizes DOE to contract for computer science teacher development programs; and appropriates funds; effective 7/1/2025, it is the position of the OCC Legislative Priorities Committee to support this measure.

Thank you very much for your kind consideration.

Sincerely yours,

/s/ Melodie Aduja

Melodie Aduja, Chair, OCC Legislative Priorities Committee

Email: legislativepriorities@gmail.com, Text/Tel.: (808) 258-8889

Submitted By	Organization	Testifier Position	Present at Hearing
Chloe Andres	Individual	Support	No

Comments:

March 15, 2018

To: Representative, Chair Donovan M. Dela Cruz

Representative, Vice Chair Gilbert S.C. Keith-Agaran

And members of the Senate Ways and Means Committee

From: Chloe Andres

Subject: Support of bill H.B. No. 2607, Related to Education

My name is Chloe Andres and I am a sophomore at Kalaheo High School. I strongly support House Bill 2607, related to education, and I would like to ask for your support as well. I feel that it is imperative that this bill be passed as our society is surrounded by technology and computer science itself, it is unavoidable, and can't be ignored.

The logic, algorithmic thinking, and problem solving aspects of computer science, or computational thinking provides an analytical backbone that is useful to all students and in any career. Like math, it is foundational and can be used in a variety of ways, in almost everything we do. At the university level, computer science is a graduation requirement for 95% of B.S. degrees Another major aspect of Computer science is digital literacy. The language of computers, understanding phrases such as "cloud, and what "cookies" are, or how

"encryption" works, are useful for every student no matter the career. It is even seen when simply scrolling through the internet, or in the settings of your Smartphone, it'd make sense to understand what these words mean. In fact, computer science is evolving and is used almost everywhere, making it imperative for us to learn about what and how it works.

Everything around us was, in some sense, affected by code, and yet most of us can write a simple program. Computer science is a flexible tool that can be used for a variety of different things. From something as simple as doing research for a school project, to something bigger, like creating a video game. In fact, some things we do everyday are influenced by CS, such as downloading music, playing online games, and online shopping. There is no way to avoid Computer science if it is all around us, the least we can do is learn to understand it.

If this bill is passed it would teach students about this new world that surrounds them and the power that they have within the palms of their hands.

HB-2607-SD-1

Submitted on: 3/16/2018 9:11:39 PM
Testimony for WAM on 3/19/2018 11:00:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Chase Warashina	Individual	Support	No

Comments:

I stand in strong support of HB 2607 which requires the DOE develop and implement a statewide computer science curricula plan for public school students in K-12 and ensures each public high school offers at least one computer science course each school year.

Not unlike may highly sought-after occupations today, the beginnings of interest into a filed begins in the formative years and through programs made available through curriculum. If enacted, students would greatly benefit from exposure in the field of computer science and technology – a major prescript for entry into the current and expanding job market. It should be the goal of our education system to prepare students intellectually and to expose them to the diversity of occupations that exist now and will exist in the future with the development of technology.

The potential impact in our state extends to multiple fields, and we can expect to fill open positions and create new wages within Hawaii. Overall, this bill creates opportunity for Hawaii and our students to grow.

Thank you for the opportunity to provide testimony on this measure.

HB-2607-SD-1
Submitted on: 3/16/2018 9:46:50 PM
Testimony for WAM on 3/19/2018 11:00:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Janelle	Individual	Support	No

Comments:

A bill for an act, HB 2607, relates to education in Hawaii. The legislature found that computer science is an important subject of study in America and computing-based occupations make up more than two-thirds of new jobs in the science, technology, engineering and mathematics (STEM) fields. Therefore, the legislature found that an education in computer science is very valuable in today's world. Legislation requires the Department of Education to implement a computer science curriculum for public school grades kindergarten to 12 statewide. High school students who learn computer science are more likely to major in it in college. Those who major in computer science in their college years are in high demand among employers across the nation. In today's world, technology is advancing each day. Students should have access to learn these different skills in order to better their future. Therefore, I am for bill HB 2607 to implement a computer science curriculum statewide for grades kindergarten to 12. By giving the students the equipment and curriculum to learn about computer science will benefit them in numerous ways. Computer science courses will open opportunities for students because it will provide them skills that they can use throughout their lifetime. In this day and age, the world's problems can be solved by technology. This bill can help students learn the basic computer skills that they can use for future jobs relating to science, technology, engineering and mathematics nationwide.