DAVID Y. IGE
GOVERNOR

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

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

LATE

Date: 01/31/2018
Time: 02:00 PM
Location: 309
Committee: House Education
House Higher Education

Department: Education

Person Testifying: Dr. Christina M. Kishimoto, Superintendent of Education

Title of Bill: HB 2607 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.

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

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:

Adoption of Computer Science Standards aligned to national efforts,
Development of single courses and pathway courses for maximum student access,
Identification of standards-based curricular resources,
Quality K-12 professional development in computer science including fellowships and externships for teachers,
A schedule of academic competitions in partnership with business, industry and government,
Expansion of regional and school-based student demonstrations,
Increased partnerships for access to meaningful internship and apprentice models, and
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 HB 2607.

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.

UNIVERSITY OF HAWAIʻI SYSTEM
Legislative Testimony

Testimony Presented Before the
House Committees on Education and Higher Education
January 31, 2018 at 2:00 p.m.
By
Donald O. Straney, Vice President for Academic Planning and Policy
University of Hawaiʻi System

HB 2607 – RELATING TO EDUCATION

Chairs Woodson and McKelvey, Vice Chairs Kong and Hashem, and members of the committees:

Thank you for the opportunity to comment on HB 2607 that requires the Hawaiʻi 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. HB2607 requires the University of Hawaiʻi to permit applicants to fulfill certain admission requirements through computer science coursework.

The University of Hawaiʻi (UH) appreciates the efforts of the legislature to boost job growth and innovation in Hawaiʻi 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 HB 2607 (pages 7-8) which would amend Chapter 304A of the Hawaiʻi Revised Statutes by adding language on admission requirements to any University campus in 2022 or thereafter.

Specifically, this section states that the University of Hawaiʻi 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 is unclear that any change is needed to the admissions requirements at UH, as stated in HB 2607, to support computer science. 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 math courses. 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 HB 2607.

The high-paid and high-demand jobs of the very near future will be in STEM and computer science. This is a fact. Already, jobs are being replaced by robots and machines, from Target cashiers to farm attendants who milk cows. However, our current education system is not offering a computer science pathway for students. When we keep education as "business as usual," we run the risk of preparing our students for jobs that will no long exist after graduation. Furthermore, entry-level STEM and computer science-based jobs are paying their employees an average of $66,000.

I support this bill, because we can do better for our keiki. If we are to prepare our students for a bright future, we need to make computer science education a priority. This bill gives us 3 years to prepare by educating teachers and restructuring our school system to include a pathway for computer science. My teachers were able to teach me the same materials that their teachers taught them, and it worked. But our world has changed. As a math teacher who began teaching in 2007, I have already seen the change in my students' relationship with math. Now students have calculators and the ability to Google any math formula or tutorial from their smart phones. So if a machine can do our jobs (and more quickly and with more accuracy), what jobs will remain for our kids? And why are we teaching them to still be one step behind machines?

Picture a world where we all walk around with phones, laptops, and tablets that provide us with all the information known to humankind at the touch of our fingers. We also can use face recognition to unlock our phones and pay our bills. We worry about cyber security and identity theft more than the security installed for our homes. We have self-driving cars that allow us to multi-task on our way to work and arrive safely. We can even go grocery shopping and check out our purchases without once interacting with a store clerk.

This is not science fiction. This is 2018. Our world is constantly changing, and so must our education.

HB-2607
Submitted on: 1/30/2018 1:16:49 AM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Russel Cheng	Dev League LLC	Support	No

Comments:

Please see our attached testimony in support of HB2607 related to K-12 computer science programs in our DOE schools.

Mahalo!

Russel

January 30, 2018

Statement of: **Burt Lum, Executive Director, Hawaii Open Data**
Testimony presented before the

House Committee on Education and
House Committee on Higher Education
Wednesday, February 1, 2018, 2:00 p.m.
State Capitol, Conference Room 309

In consideration of
HB2607
RELATING TO EDUCATION.

Chair Woodson, Vice Chair Kong, and Members of the Committee on Education and
Chair McKelvey, Vice Chair Hashem, and Members of the Committee on Higher Education:

I, Burt Lum, Executive Director of Hawaii Open Data, offer my **Strong Support** for HB2607 that establishes computer science curriculum in the public schools and allows students to fulfill an entrance requirement in mathematics or science with a computer science credit.

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 a key skill set required to be competitive in the 21st century workforce. 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. The policies encouraged by this bill would better prepare Hawaii's students for high paying, in-demand careers.

Thank you for the opportunity to offer this testimony.

HawaiiKIDSCAN

david.miyashiro@hawaiikidscan.org
hawaiikidscan.org

David Miyashiro
Executive Director

LATE

January 31, 2018

Committee on Education
Rep. Justin H. Woodson, Chair
Rep. Sam Satoru Kong, Vice Chair

Committee on Higher Education
Rep. Angus L.K. McKelvey, Chair
Rep. Mark J. Hashem, Vice Chair

State Capitol
415 South Beretania Street
Honolulu, HI 96813

Aloha Chairs Woodson and McKelvey, Vice Chairs Kong and Hashem, and Members of the Committee,

HawaiiKidsCAN supports HB 2607, which 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; and requires the University of Hawaii to permit applicants to fulfill certain admission requirements through computer science coursework.

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 to help further the momentum for greater equity and access to computer science (CS) learning 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 in increasing K-12 CS capacity while preservice CS preparation programs are being developed for future educators.

- 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 eight percent in Hawaii, compared to just four 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]

- 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.[4] 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.

- Of the 290 AP CS test takers 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.[5] Early exposure to CS can have a significant impact on eliminating the gender gap in the CS labor force. After participating 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.[6] 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.[7]

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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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

4 "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

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

6 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

7 "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.

HB-2607
Submitted on: 1/30/2018 12:33:58 AM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Aisha Heredia	HawaiiKidsCAN	Support	Yes

Comments:

January 31, 2018

Committee on Education

Rep. Justin H. Woodson, Chair

Rep. Sam Satoru Kong, Vice Chair

Committee on Higher Education

Rep. Angus L.K. McKelvey, Chair

Rep. Mark J. Hashem, Vice Chair

State Capitol

415 South Beretania Street

Honolulu, HI 96813

Aloha Chairs Woodson and McKelvey, Vice Chairs Kong and Hashem, and Members of the Committee,

My name is Aisha Heredia, I live in Manoa and am a former science and technology educator. I currently work for HawaiiKidsCAN and am proud to support HB 2607 to increase access to computer science learning opportunities.

The jobs of today are highly tech-based, and often working in virtual project teams with design-centered focuses. Computing occupations are the #1 source of all new wages in the U.S., and here in Hawai`i there are not enough skilled workers to fill the currently available computer science positions. Often Hawai`i companies have to recruit skilled workers from other states and countries.

In 2009, almost a decade ago, I worked in Silicon Valley as a researcher for Stanford Research Institute (SRI International). We investigated questions on the root causes of lack of women who go into STEM (Science Technology Engineering Math) professions, and lack of people of color who are in tech professions. Major themes we came across were: lack of engagement for girls of color in STEM related school activities, lack of access to innovative STEM programming in Title 1 schools, and lack of teacher knowledge on STEM project-based learning in Title 1 schools. Sadly, the themes from a decade ago are still the themes of today…

Thus, to have an equitable workforce of women, people of color, people from low-income communities capable of filling high-tech jobs, we need an educational system that creates opportunities for everyone--from diverse and low-income communities to have high-quality computer science offerings, and teachers who are well versed in design-centered project-based learning.

To do this, there needs to be funding for teacher professional development, and funding for the DOE to develop a strategic plan for actively engaging students whom are under-represented in STEM careers. Funding for programs that will serve Title 1 schools, and open doors to girls/women, and students of color to STEM career fields.

- **Research shows (see: The State of K12-Computer Science found on Code.Org, https://code.org/about/2016, and Engaging Youth with STEM Professionals research https://projects.ncsu.edu/meridian/winter2010/koch/print.html), that early exposure, even starting in middle school, to CS can have a significant**

impact on eliminating the gender gap in students who go into the CS labor force.

We are asking to provide funding so schools can offer high-quality CS opportunities. We need girls and students of color to meaningfully engage in CS, and to do that we need funding for professional development, and a strategic DOE plan for increasing CS and STEM in Title 1 schools and Charter Schools. The future of Hawaii's STEM labor force depends on educational shifts of today. I am in support of HB2607.

Mahalo,

Aisha Heredia

Former Tech Educator, now Community Outreach for HawaiiKidsCAN

Honolulu, HI

HB-2607
Submitted on: 1/30/2018 11:26:45 AM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Kaui Trainer	Momilani Farm	Support	No

Comments:

Aloha,

I am a school counselor at LaupÄ• hoehoe Community Public Charter School and I cannot emphasize enough the importance of charter schools receiving more funding. In particular, relating to computer science, our school has one technology class. It has two computers. Two. There is not enough funds to purchase more. The software for these computers is out of date. The teacher often expresses the frustration of not having enough resources to teach our students and, honestly, the students are used to not having enough. So they just view it as a free period while they wait their turn to go on the two computers. Please support HB2607 and in particular, fund schools like ours that do not even have adequate hardware or software!

Mahalo,

Kauʻi Trainer

Seri Niimi-Burch
PO Box 898
Honoka‘a, HI 96727

Representative Justin H. Woodson, Chair
Representative Sam Satoru Kong, Vice Chair
Hawaii House Committee on Education

RE: HB2156 Relating to the Hawai‘i Farm to School Program

January 30th, 2018

FoodCorps is a national service organization with the mission of connecting kids to healthy food in schools and a member of the Hawai‘i Farm to School Hui. I am writing as a representative of FoodCorps in strong support of HB2156, which would authorize the Department of Education to establish a farm to school program and establish two FTE farm to school staff positions within the Department of Education.

I have been excited to see the success of the Farm to School pilot program in the Kohala Complex and its expansion to Mililani High School, as well as the commitment made by the School Food Services Branch of HIDOE to the ‘Aina Pono Farm to School Initiative. The passage of this bill will support their efforts and benefit our state in many ways.

Farm to School improves health through increased consumption of fruits and vegetables, enhances educational opportunities and improves academic achievement, and strengthens our agricultural sector by growing future farmers and demand for locally grown foods. Our corps of FoodCorps AmeriCorps members currently provide hands-on nutrition, garden and culinary education, promote local and fresh foods, and collaborate with school communities to create healthier food environments in 14 schools on O‘ahu and Hawai‘i Island. From watching students overcome their fear of vegetables to supporting teachers utilize the school garden to augment lessons taught in the classroom, we have seen first hand the positive impacts that Farm to School has on our keiki, schools and communities.

Increasing HIDOE’s capacity through the establishment of farm to school positions is essential to expanding school food improvements in cafeterias statewide, providing support for school garden programs, and establishing a protocol for serving school garden produce in cafeterias. Mahalo for your consideration of this testimony and this bill.

Seri Niimi-Burch
Hawai‘i Fellow, FoodCorps

Purple Maiʻa Foundation
98–820 Moanalua Road, #15-547
ʻAiea, HI 96701
kokua@purplemaia.org

January 30, 2018

19th Hawaiʻi State Legislature

Subject: Support for HB 2607

Aloha e Legislators,

On behalf of Purple Maiʻa Foundation, I am writing today in support of HB 2607 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 Hawaiʻi admission requirements, and would appropriate funding to the HIDOE to support the above changes.

Purple Maiʻa is a nonprofit that has been working since 2013 to create access to empowering education in coding and computer science for Hawaiʻi's youth, especially those growing up in schools and communities where resources for CS learning are not available. We've seen first hand how Hawaiʻi's public schools are not 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.

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.

Me ka haʻahaʻa,

Donavan Kealoha
Co-Founder and Chief Staff, Purple Maiʻa

January 30, 2018

Re: HB 2607, Strongly Support

Dear Committee Members,

Code.org and Women in Technology (Maui Economic Development Board) strongly support HB 2607. 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 develop a statewide strategic plan for expanding computer science education, and that the University of Hawaii allow a student to fulfill an entrance requirement in mathematics or science with a computer science credit. 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.

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, 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

AlgorithmHub

January 30, 2018

LATE

To: Hawaii State House Committee
From: Alex Cabello, Chief Technology Officer, AlgorithmHub Inc.

Re: HB1958 RELATING TO THE HAWAII TECHNOLOGY DEVELOPMENT CORPORATION

In Support

AlgorithmHub Inc., a Hawaii based startup, supports HB2607 Relating to Education.

I am a graduate from the University of Hawaii department of Electrical Engineering and have over 15 years of professional computer programming experience. I was introduced to computer programming as a senior at Mililani High School in 1996 as an extra credit after school class where we learned PASCAL. Taking the class inspired me to pursue a career in STEM. Twenty years later, as technology continues to advance, I believe every student in every school should have the opportunity to learn computer science, just like biology, chemistry or algebra.

Computer science requires logical thinking and strong problem solving skills. These skills should be taught at an early age to inspire and prepare students who are interested in science and technology. There have been numerous advancements in computer science curriculums that help students learn computer science without the need to learn complex syntax. For instance, the non-profit, code.org, has curriculums to help students engage in computer science.

It is very important that the Hawaii public education system embraces computer science and allow our youth to be competitive in the STEM job market.

Thank you for the opportunity to submit testimony.

Alex Cabello
CTO, AlgorithmHub Inc.

11 Ao Hoku St. Kahului, Hawaii, 96732 | 808-358-9101 | www.algorithmhub.com

HB-2607
Submitted on: 1/29/2018 7:57:41 PM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Kaulana Dameg		Support	No

Comments:

HB-2607
Submitted on: 1/29/2018 10:18:38 PM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Donavan Kealoha		Support	No

Comments:

HB-2607
Submitted on: 1/30/2018 9:42:40 AM
Testimony for EDN on 1/31/2018 2:00:00 PM

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

Comments:

My name is Justin Delos Reyes and I am in support of bill HB2607!

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 to those courses 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. I have been visited in my AP Computer Science classrooms 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 HB2607 to provide Computer Science education and accessibility to all students in grades K-12!

Testimony HB2607

I am Patrick J Gilbert. I hold a PHD in Computer and Information Science; MS in Computer Science; MEd in Educational Administration with an ABD; and a BEd in Secondary Mathematics Education. I have taught for 8 years in high school. I have many years – both full and part time – in the UH System at Kapiolani, UH West Oahu, and UH Manoa. At UHM, I have been in both the Business Information Technology Management programs as well as the Natural Science Computer Science program. I was the first official teacher of Calculus in the DOE in 1968. I was the first unofficial teacher of computer programming at McKinley in 1970. I could go on with other credentials but let us proceed to the proposed legislation.

First, let me state I have been and remain an advocate of "computer education" ranging from the simplest application of the tool to the theory and programming skill. Anything I say herein does not dissuade from that advocacy.

Bill HB 2067 is trash. It should be withdrawn to avoid further embarrassment to this State and its people. It may have been drafted with the intention of doing "good" – but it could not be a poorer demonstration of incompetence than it is.

The prelude to the bill on the first two pages that seems to attempt to demonstrate a foundation for the need for computer science is garbage. Pure garbage. Poorly written. Factually inaccurate. Twisted and contorted in logic. Wondering in its use of references with overlapping categories from computer science to application and help desks as if these were all one thing. I would have called this a spaghetti or chop suey argument but that would have insulted those dishes which are far more organized than that of the argumentation paragraphs.

One strikingly notices that there are no citations for reference to any claimed fact.

Example 1: The claim is that only 155 students graduated from with a computer science degree in 2014. That number is ridiculous. UHM Computer Science may have graduated that many in its combined BS, BA, MS, and PHD programs alone. Then Kapiolani, Leeward, Honolulu, Maui, and Hilo must have added to "computer science" graduates in the multiple different programs and degrees. After that you have programs at various private colleges. And, what about all the students who graduated from mainland college. To put it simply – what lousy research! What shoddy reporting!

Example 2: The claim is that there are 1,343 "computing jobs" open in Hawaii. There may be but they are not computer science. A review of Monster, Linked In, Carreers, and other web sites – that overlap in their announcements – shows that the job descriptions of the open positions range from "operator", "key puncher/data input", junior to senior programmer, and dozens of other categories. There were even "secretaries" classified into the group because "computer skills" (using a word processor) we in the job title. The research reported was sloppy.

Example 3: The $78K average job salary was not for "computing jobs" but much more specifically for "computer science" positions. Again sloppy. But, if you are desperately trying to make an argument you falsely grab any number you can.

Probably the sloppiest part of the introductory arguments and that follows through the entire bill is the inconsistent and misuse of the term "computer science". The bill suffers from a lack of definitions as

part of the initial argument. Had the definitions been consistently applied, maybe some of the glaring errors would have been revealed.

This lack of clarity seems to point to the fact that this bill was written by advocates looking to please an audience not those who understand.

Page 3 #1A/B are fine as they are basically under the complete control of the DOE. The DOE will be forced to deal with the content and relationship to other courses. Also, there already exists a National Draft plan for K-12 computer technology education that can be leverage without a complete restart.

Page 3 #2 is a "who cares". Again, the focus seems to be on UHM not on the fact that there are multiple community colleges and other 4 year institutions that already do not have as stringent a set of entrance requirements thus "waiving" or "equating" is not that big a deal until you get into the details.

The next so many pages require all kinds of activities be done.

There are some specific requirements that attempt to substitute a computer science—undefined in content – for a "science" course. That will be extremely difficult if the student is majoring in the sciences as the basics of biological, physical, and chemical science are required for entry. The Legislature feels it can "order" or "motivate" the UH system but good luck with the rest of the world. One must doubt that Stanford, Berkeley, MIT, Harvard, and such are about to change their entrance requirements.

So, we should now discuss the impact of removing either a science or math credit for a computer science credit. If the intent is to graduate computer science – in its normal meaning – graduates from a 4-year institution then mathematics up to and including Calculus is a requirement. There will be no room for substitution. And, the mathematics of Computer Science in particular, not just that of the UH Business school or other 4 year programs, is very difficult and more theoretical and more mathematical than simple "calculus". The Legislature needs to stay away from mandating curricular change.

There is already a mechanism to earn credit for computer science in high school. One can take either the traditional AP exam or the new computing fundamentals AP exam. Open to many, is the ability to attend a community college or other institution on the jump start program to take the introductory courses in computer science.

There are few if any "computer science" certified or educated teachers in the department and a simple "in-service" training will not be sufficient. A serious effort and serious funding including releasing a teacher for a year or more to get the necessary education. If the Legislature's goal is Monkey-see, Monkey-do then go with in-service. If you want teachers who can handle computer science, you must provide the time and resources.

Part of the problem with the Bill is simply the general sloppiness of what the goals are.

My primary suggestion: Withdraw this Bill immediately to avoid further embarrassment. Call together, and I can assist, key players who can better shape this direction who are not necessarily to advocates. This will be tough – because lots of people with see territories and money and resources that they could acquire. What you do not need are people uninformed about the very nature of introducing computational thinking into the curriculum.

Here are my suggestions:

1. Request that the DOE and UH System work immediately to provide access to introductory computer science courses with some combination of on-campus or remote/distance education effective Fall 2018. Make available to every senior student in a school in the State who is qualified access to the coursework. Fund the report.
2. Continue the Legislature's demand for a report and plan. The plan should be finished by November 2018 for review. The plan should have a focus of implementation by Fall 2019 phase over levels and DOE structure.
3. The Legislature should get out of the business of dictating programs but should demand quality and effective implementation. For example, your Bill dictates that the contractor who might assist the State do so using "concrete in hands-on, inquiry-based practices". As nice educational jargon the words may be meaningless in implementation. The Legislature has gone too far in too many of its dictates and all such "dictates" should be removed with the DOE instructed to determine the "dictates" that are appropriate.

Let me state again, I am and have been a computer science, computer technology, computer application, and associated ideas advocate. But, this Bill begins with sloppy logic, fails to understand both the current and potential future structures, and oversteps and interferes with DOE/BOE responsibilities. I can understand the frustration that lead to such overreach because the DOE/BOE have not been and still remain as one of the most frustrating institutions to deal with.

HB-2607
Submitted on: 1/30/2018 10:19:34 AM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
M Redwan Chowdhury		Support	No

Comments:

My name is M Redwan Chowdhury. I am a senior at James Campbell High School and a passionate Computer Science enthusiast. I support HB2607 for future advancements in Computer Science. Technology is indisputably the future of our world. Every year, we are becoming more and more advanced and evolving as a society. This would not be made possible without Computer Science. HB2607 indirectly supports all of these advancements. First, it helps support and fund teachers of Computer Science. Without these teacher, students would likely not have the opportunity to learn Computer Science and grow up to revolutionize the world. In an increasingly technology based world, students MUST be able to keep up with the new advancements and must be taught and conditioned to do so. I personally have have decided to major in Computer Science, and with opportunities given with these very Computer Science classes at school, I have earned college credit and gotten a huge head start in my learning. I want these opportunities to continue to be available to future students from all grades k-12.

HB-2607
Submitted on: 1/30/2018 10:50:58 AM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Keanu		Support	No

Comments:

I think AP computer science should get funded for schools across because more people should study in computer science. In the future its mostly gonna be technoligy and it should open more jobs and require more people to do those jobs.

HB-2607
Submitted on: 1/30/2018 11:24:25 AM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Dana Ishii	Teacher	Support	No

Comments:

I teach "computers" at an elementary school for students in grades K-6. When I was a child computer class meant learning keyboarding and playing Oregon Trail, many teachers still believe that this class should teach students how to type, and while I believe this is an important skill to have, it is one that will be aquired through the everyday practice of typing and use of computers. What would be better is if computer teachers started teaching the science of how computers work, and how programs are made. Just as we learn about biology not because we all are going to become doctors or biologist, but because we all have bodies and it is important to learn the science of how those bodies and other living organizims work, it is now equally important that we learn the basic science of how computers and the technology around us works.

Computer science teaches math and logic and critical thinking. It forces students to think about the world around them, encourages them to build on, adapt and improve and would give them a better skill set to be ready to work in an ever changing world.

HB-2607
Submitted on: 1/30/2018 11:31:38 AM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Megan Kawatachi		Support	No

Comments:

This bill aligns well with what is being done in private schools, as well, which could allow for a comprehensive, statewide effort and a prime opportunity for resource-sharing and professional development for teachers.

HB-2607
Submitted on: 1/30/2018 2:05:26 PM
Testimony for EDN on 1/31/2018 2:00:00 PM

LATE

Submitted By	Organization	Testifier Position	Present at Hearing
Kekoa McClellan		Support	Yes

Comments:

January 30, 2018

Committee on Education

Rep. Justin H. Woodson, Chair

Rep. Sam Satoru Kong, Vice Chair

Committee on Higher Education

Rep. Angus L.K. McKelvey, Chair

Rep. Mark J. Hashem, Vice Chair

State Capitol

415 South Beretania Street

Honolulu, HI 96813

Aloha Chairs Woodson and McKelvey, Vice Chairs Kong and Hashem, and honorable Members of the House Committee on Education and Committee on Higher Education,

Please accept this testimony in strong support of HB2607, which 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; and requires the University of Hawaii to permit applicants to fulfill certain admission requirements through computer science coursework.

Computer Science gives students vital 21st century skills. These skills strengthen local community, national innovation, and opportunities for youth. Computer Science - not computer literacy - underlies most innovation today, from biotechnology to cinematography to national security. Yet the majority of U.S. schools require only that students use computers. Seldom do schools prepare students to innovate and create the new technologies that drive local and national economies. This ability to innovate with technology is also important for students' future success and ability to make a difference in a global society.

This measure gives our students and our teachers the skills and tools to succeed in a 21st century economy. Mahalo for your consideration of this testimony in support of HB2607.

Kekoa McClellan

The McClellan Group

HB-2607
Submitted on: 1/30/2018 3:26:53 PM
Testimony for EDN on 1/31/2018 2:00:00 PM

LATE

Submitted By	Organization	Testifier Position	Present at Hearing
An		Support	No

Comments:

Good Day Senators,

I'm Andrew Leachman,Ii am a computer science student attending Hawaii Technology Academy. I am very supportive of this bill and think that computer science should be implements in schools. Computer Science provides a great way for students to practice critical thinking and an outlet to express onself. Please take my testomny into account as well as my fellow students. Thank You!

LATE

HB-2607
Submitted on: 1/30/2018 3:27:01 PM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Chanelle Chin		Support	No

Comments:

Hi Legislators,

My name is Chanelle Tolentino and I am a Computer Science teacher at Hawaii Technology Academy. I am in support of this bill because I believe CS education is important for all students in Hawaii. Our CS students at HTA learn many things from CS not just coding languages, but how to work collaboratively, how to communicate, how to think critically as they develop applications relevant to solving our real-world problems. Students learn the relevance of math, english, and science as they strive to create algorithms, think logically, and debug their programs. I believe these are the skills we want all of our students to have and excel in and that students will increase in their content area skills as they learn computer science in their classrooms.

HB-2607
Submitted on: 1/30/2018 3:30:25 PM
Testimony for EDN on 1/31/2018 2:00:00 PM

LATE

Submitted By	Organization	Testifier Position	Present at Hearing
Matthew Favela	student	Support	No

Comments:

Dear Legislature,

My name is Matthew Favela, currently attending Hawaii Technology Academy in the 9th grade. Ever since I was a little kid I always dreamed about programming my own programs and websites because I thought it was such an awesome ability to be able to code. I tried everything from online websites, to youtube videos, to actual 1 week classes around the island. But somehow never was really able to learn Computer Science and fully go through learning Computer Science. Now starting my freshman year I transfered to Hawaii Technology Academy and found out that I was able to take a Compter Science course. From then on I became so happy to finally learn programming languages I understand. I now know how to fully create a website from start to end on my own withing one semester. I am currently taking the more advanced course which is also teaching more and more information which can help me further my programming experience. Not only is this fun and awesome to code but it also will also be great later on when I start looking for programming jobs like being a software engineer or a video game programmer. I want every school in Hawaii to have the same opportunities that I have because not only is programming jobs in demand, but it also gives people from Hawaii a chance to be more successful. Some of my friends had no idea what they wanted to do with their career, but now my friends and I are all excited to program cool and interactive websites and are looking forward to getting jobs in programming.

Thank you for your time,

Matthew Favela

HTA Freshman

HB-2607
Submitted on: 1/30/2018 3:31:34 PM
Testimony for EDN on 1/31/2018 2:00:00 PM

LATE

Submitted By	Organization	Testifier Position	Present at Hearing
Aaron Soma		Support	No

Comments:

My name is Aaron Soma and I am a student at Hawaii Technology Academy. I am currently in a computer science class. I enjoy learning in this class and think that other schools should have the same opportunities as I have learning in my computer science class. I know these can open more opportunities for knowledge, jobs, and more. Especially at the time, we are now computers and technology is especially essential in our day and age. I overall think opening this kind of knowledge to other students would help us develop our future posterity.

HB-2607
Submitted on: 1/30/2018 3:32:04 PM
Testimony for EDN on 1/31/2018 2:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Elijah Richards		Support	No

Comments:

Hi, my name is Elijah Richards and I am a student at Hawaii Technology Academy, and I am taking a back-end web development class, and I think that every student at every school should have the opportunity to experience this. There is a lot of knowledge that can be gained from computer science classes. And in today's age, computer knowledge revolves around everything. If you know how to code and program a computer, you have so many job opportunities come flying at you. You won't settle for a job as a small chef, or a bus driver, you can be the next Mark Zuckerberg. There are so many opportunities for this generation, and all it takes is a semester-long course. That is why computer science course should be taught at every school.

A Critique Against HB 2607

We need to step away from STEM and think differently about the paths students are allowed to take in life to become a well rounded individual capable of critically thinking and adaptively growing

By Alexander Duong

Front-End Web Developer || User Experience Researcher

Major: American Ethnic Studies @ University of Washington

Contact Me: aduong2@uw.edu .// aduong2@hawaii.edu .// (808) 389-2672

"Your major does not define your career."

By Ana Mari Cauce - 33th President of the University of Washington

Link to the Google Doc of this PDF for further comments:

https://docs.google.com/document/d/10ShrIFbmkresTLJ5j261rY_4zcqwLbUKN65ZXhfdbj4/edit?usp=sharing

HB 2607

A BILL FOR AN ACT

RELATING TO EDUCATION.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

SECTION 1. The legislature finds that the importance of computer science cannot be overstated. For example, 50% of Americans rank computer science as one of the most important subjects of study, after reading and writing, and 75% of Americans believe computer science is "cool".

Simple changes to the mathematical language usage is needed to provide visual and linguistic clarity to those who are American, but did not learn English as their first language. In the case of Hawaii, statistics have shown that Hawaiian Creole English is the most common first language learned by children. While arguably, HCE is increasingly similar due to assimilation of English as its lexifier, there is enough linguistic difference to consider that HCE is a distinct language as specified by ISO 639-3.

The change from using spelled out numbers and the word “per cent” is to standardize the bill’s mathematical language and objectivity. Numbers, and by extension, math, is understood by a wider audience versus using spelled out numerals, which limits the bill’s interpretation to those who understands the nuances of English. One criticism that needs to be drawn is the use of the word “per cent” rather than “percent” or the percentage symbol. While the use of the word “per cent” is recognized by countries outside of the United States, Hawaii is a “state” of America, and thus, the word “per cent” should be compounded to “percent” or the respective symbol should be used in place. For statistical and objectivity purposes the percentage symbol (%) should be used instead of spelling it out because the symbol is widely recognized versus an archaic spelling of “per cent.”

“Cool” is vaguely defined here. A refrigerator is “cool.” A new toy to a child is “cool.” The need to specify what “cool” means here is necessary because “cool” is a subjective term. An improvement to the language here is to provide a operational definition in the use of the word “cool”. In such case, the word “cool” can be defined as: Americans seeing computer science as a new pathway that one can go work towards. Another example, Americans see computer science as a popular path to major and build a career around.

The legislature further finds that computing-based occupations make up more than two-thirds of all projected new jobs in the science, technology, engineering, and mathematics fields, commonly known as STEM fields. This means that college graduates with computer science degrees are in high demand among employers across the nation. Students who learn computer science in high school are six times more likely to major in it, and women who learn computer science in high school are ten times more likely to major in it.

The first two sentences can be combined. "High" in this case is not objective, a 2% increase from 0.09% is a significant increase, which implies a "high" amount. Please reconsider the use of the word "high" without supporting this with statistical evidence. Could the legislature and/or supporters provide evidence that there is a significant increase or "high" demand in technology based jobs in towns and cities like Haula, Lanai City, Waimanalo? What does across the nation mean? Does that include cities like those listed? If across the nation means an "average increase in demand of STEM related jobs", why not use that phrasing (provided that statistics is used to support the claim) instead of using an "America the Great" argument.

> The legislature further finds that computing-based occupations make up more than two-thirds of all projected new jobs in the sciences, technologies, engineering, and mathematics fields, which entails that college graduates with STEM degrees are in demand by employers across the West Coast and East Coast.

Students from where? Do they think it's "cool"? 6 times more likely to major in Computer Science means that if they are not interested in majoring in it in the first place then they are not interested in majoring in it in the first place no matter how many multipliers (12 times more likely, 24 times more likely, a million times more likely) is attached to the statement.

Again, attaching multipliers to a statement does not make it any more likely for a "women" in "high school" will major in Computer Science if they were not interested in the first place. Zero times ten equals zero. How is "women" defined here? Are "women" 18 years of age and older? If so, why are they in high school? Could the legislation clarify this statement? As a suggestion: the term *female identified student* is a necessary phrase if we are bringing gender and sexuality politics into this because there are more than 2 genders and more than 2 sexes.

The legislature also finds that recent survey and research results show a disparity between the demand for computer science education and its availability. Although sixty-seven per cent of parents and fifty-six per cent of teachers believe students should be required to learn computer science, and ninety per cent of parents want their children's schools to teach computer science, only forty per cent of schools offer such courses. Further, although seventy-one per cent of new STEM jobs are in computing, only eight per cent of STEM graduates hold degrees in computer science.

I agree, but there's a disparity between the demand of digital arts and communication, a disparity between the demand of students wanting to be doctors, a disparity between disparities, and their availability. Do we exclude the medical field, which includes chemistry, biology, physics, the sciences, from STEM? Do we exclude digital arts and communication, which includes visual communication, interaction design, user experience research, the technologies from STEM? Why is the legislation using the acronym STEM when it should be CS?

To address everything that is highlighted yellow. Please use numerals and percentage symbols when providing statistics. The use of spelling out numerals and the archaic spelling of "per cent" limits the ability of those who wants to participate in creating a rigorous bill because of the poor and inefficient choice of language usage. To reiterate, this is 2018, not 1959, please update the language usage to fit modern and contemporary legal writing; see Washington D.C. legislatures for example of modern, contemporary, current language usage; or take English 101 at the University of Hawaii at Manoa for an up-to-date approach at the English language.

Who conducted the studies on the percentages given? It seems relatively biased because it seems like the questions posed towards students and parents in this study are phrased in such way to reinforce the idea that they need or "require" computer science. Also, Computer Science is becoming a vague term now. Computer Science can be specified into Front-End Web Development, Full-Stack Web Development, Artificial Intelligence Engineer, Machine Learning Researcher, etc. Though Computer Science is a basis step in creating the foundations necessary to facilitate learning higher level concepts, without having specialized skills in the industry nowadays is detrimental to one's own career. No one wants a generalist, so why have a high school student go through Computer Science with expectations that they become generalists rather than specialists.

The legislature also finds a similar disparity at the state level, where computer science has the potential to drive job growth and innovation throughout the economy. As of December 2016, there were 1,343 open computing jobs in Hawaii, and the average salary for these computing jobs was $78,414, which is much higher than the average state salary of $47,740. However, only one hundred fifty-five Hawaii students graduated with a computer science degree in 2014, and only fourteen schools in Hawaii offered the advanced placement computer science course in 2015-2016. The legislature finds that promoting computer science education is a matter of statewide concern.

But to live in Hawaii comfortably on a single person income is about $120,000. So, I don't understand the point of specifying salary in this nor the "1,343 open computing jobs in Hawaii," when Hawaii has a 1.4 million population. Let's say 10% of the 1.4 million population are students in grades K-12, which amounts to: 140,000 students in grade K-12 in the state of Hawaii. Or even less, let's just say 1% of the total population are students in grades K-12, which amounts to 14,000 students in the state of Hawaii in grades K-12. And let's then say, there is an even distribution of students at each grade level, meaning approximately 1100 students at each grade level in the state of Hawaii. Now, let's say that the seniors in high school goes off to obtain their degrees in some college and only half of the remaining students of the senior class is going to the University of Hawaii to obtain their Computer Science degree, which amounts to 550 students.

When all 550 students from the state of Hawaii graduate with a computer science degree, that would mean that there would be a little more than half of the original amount of jobs left in computing within the state of Hawaii. What if some of the students who went to college elsewhere returned to Hawaii, let's say half. Then that would mean a little less than half of the initial amount of computing jobs leftover. This is also not including students who are not residents of the state of Hawaii competing for these computing jobs. At this point, I'm illustrating the fact that 1,343 open computer jobs in Hawaii means nothing when we're comparing it to the population as a whole.

I expected this to be well argued to the legislation before having this bill passed because there are no major tech companies here to enable a larger computing job market to exist. Additionally, all computing jobs on the island has a relation to Hospitality and Tourism, which defeats the purpose of Computer Science, which is to research and develop new computational technologies.

The purpose of this Act is to promote the knowledge of computer science education in the State by

1. Requiring the department of education to:
    a. Develop and implement a statewide computer science curricula plan for public school students in kindergarten through twelfth grade; and
    b. Permit students attempting to graduate from public high schools to fulfil some math and science requirements through the satisfactory completion of computer science coursework; and
2. Requiring the University of Hawaii to permit applicants to fulfill certain admission requirements by demonstrating the satisfactory completion of high school computer science coursework.

I fixed the language, for you, my dear legislators

1. Requiring the Department of Education to:
    a. Develop and implement a statewide computer science curricula plan for all public schools for students in Kindergarten through the twelfth grade; and
    b. Permit all students graduating from a public high school to fulfill some graduation requirements through the satisfactory completion of computer science coursework; and
2. Requiring the University of Hawaii to:
    a. Permit applicants to fulfill appropriate admission requirements by demonstrating the satisfactory completion of high school computer science coursework; and
    b. Guarantee that satisfactory completion of any public high school computer science coursework, regardless of which high school the coursework was completed at, will be accounted equally and irrespective of when the coursework was completed after this bill is passed.

For section 2, I will be writing my critiques in black

SECTION 2. Chapter 302A, Hawaii Revised Statutes, is amended by adding two new sections to be appropriately designated and to read as follows:

"§302A-A Computer science; curricula plan; public schools; credits.

(a) The department shall:

(1) Develop and implement a statewide computer science curricula plan for public school students in kindergarten through twelfth grade, which shall include:

(A) The goals of the computer science curricula;

(B) Strategies for accomplishing the department's goals; and

(C) Timelines for carrying out the strategies described in the plan;

It's admirable to support students from Kindergarten to the twelfth grade with a computer science curricula, it is to note that this curricula must incorporate not only "STEM" topics but the arts, communication, and business as well. For legislators who have not worked in the tech industry before or have not worked in any related field, STEM is no longer the appropriate term to use. If the panel would like to use the modern and contemporary term: *tech* to imply technology based jobs, it would be better to do so this way. However, if the curricula is intended to include the sciences, technologies, engineering, and mathematics, then the more appropriate way to write it would not include the acronym, but instead use specific topics or titles related to a specific topic in the fields or job titles. For example, instead of writing science, we can specify: Chemical Thermodynamics. Another example, instead of writing technologies, we can specify which type of technology: Wireframe and Prototyping for User Interfaces. Does this mean that titles like: introduction to chemistry is bad? No, if a course or class is introductory or foundational, then it is appropriate to use it.

Before I digress too far, my argument here is to say: is this a Computer Science curricula that will be developed or a STEM curricula? Though Computer Science is a subset of STEM, STEM itself is lacking in many ways and contributes to the STEM elitism mentality, which creates an atmosphere of animosity towards other fields of study. I can edulicate more on this by email: aduong2@uw.edu

The strategies and timeline of this needs to be rigorously tested, researched, and designed by not only members of the department of education, but by the communities within the state of Hawaii. The reason why we need multiple views on developing curricula such as this is because herd mentality is a prevalent issue when it comes to creating bills such as these. Bills that are not rigorously created do not take account into people in other fields, people in the community, current students, former students, Asian and Pacific Islander American culture, current standards in the industry, residents of Hawaii that do not live on Oahu, gender and sexuality within technology, etc. If the state of Hawaii legislators would like to contact me so I could defend my point more verbosely, I will be happy to do so.

(2) Establish and publish public school computer science standards across all grade levels from kindergarten through twelfth grade. The standards established by the department shall focus on the creation and use of software and computing technologies at all grade levels;

Will this replace art? Physical education? How will this be implemented? I can **one-hundred per cent** uphold my argument that this type of education will fail that unless this bill can guarantee that computer science is not to replace any subjects in school that is critical to building a well rounded student in the Arts, Sciences, Language, Humanities, History, Technologies, Engineering, and Mathematics.

(3) Establish dedicated computer science administrative and leadership positions within the department;

This will fail because this assumes that there are people in the state who are willing to work for a lower pay, less opportunity for growth within the Department of Education in lieu of a “computer science job” that will pay $78,414 versus a Department of Education job that pays slightly more than the state average of $47,740.

(4) Establish means by which public school teachers may become certified in teaching computer science; and

Will it be the same process as becoming a teacher in the state of Hawaii? Will the process of becoming a teacher in the state of Hawaii be revamped? Because currently, looking through the University of Hawaii's curriculum to obtain a certification for teaching, the coursework is minimal for all fields of teaching in K-12, and not rigorous enough to demonstrate a teacher's understanding of their topic of choice.

(5) Beginning with the 2021-2022 school year, ensure that each public high school offers at least one computer science course during each school year.

Again, what is computer science? Are we going to teach Kindergarten students Machine Learning and Artificial intelligence? Are we going to not talk about design and research within Computer Science? Are we going to not provide students technical writing course?

(b) Each computer science course offered by a public school:

(1) Shall comply with the curriculum standards and requirements established by the department; and

How is this going to be enforced? Seems like a lot of public schools are getting away with their own implementation "high" standards, but I believe that the legislation thinks that it is "cool," so the issue is not existent, right?

(2) May be made taught in a traditional classroom setting, blended learning environment, online environment, or any other technology-based environment that is appropriate for participating students.

So does that mean we are dropping Hawaiian studies or teaching students Hawaiian ways of living? If so, why are legislators pushing assimilation of American culture on to students who are from Hawaii? Clearly, legislators, the word technology is becoming vague. Back in the 17th century, the latest technology was a stool, or "backless chair." Nowadays, a stool is a commodity. A technology-based environment can be in the forest, as we still have developing ecological technology (without the use of electronics) from Chicanx and other native peoples' technology. We have artificial intelligence environments, does that mean we are going to augment students with artificial intelligence or "technology" to bring them into a "technology-based" environment like the Matrix? If so, then I can bring up ethical issues about said plan.

(c) The department shall permit any student intending to graduate from a public high school in 2022 or any year thereafter to elect to fulfill:

(1) One mathematics credit requirement by satisfactorily fulfilling one computer science credit; provided that the student has completed second-year algebra requirements; and

Agreed. However, be cautious about how the department goes about this because it will lead students who are trying pursue a degree outside of Hawaii to regret their decision of using a high school level computer science course in place of a mathematics course because the standards of computer science in high school have not been established by the Federal Government nor state governments.

(2) One science credit requirement by satisfactorily fulfilling one computer science credit; provided that the same computer science credit shall not fulfill more than one credit requirement.

So what fields of study are we cutting from a student's curriculum to include computer science instead? Hawaiian studies? Art? Language? Physical Education? Or are we going to make school days longer to accommodate?

§302A-B Computer science teacher development programs.

(a) The department shall develop and implement professional development programs for teachers who teach computer science courses required under section 302A-A.

Please define “professional development programs” in section 302A-A

(b) The department may elect to fulfill subsection (a) by entering into a contract or arrangement with one or more other entities to develop and implement these programs; provided that an entity shall be:

(1) An educational agency, including a charter educational agency, or a consortia of educational agencies in the State;

So European based education? Why are we not implementing project based education, Native Hawaiians have been using project based education for centuries, the University of Washington’s CS, Informatics, Human-Centered Design and Engineering, Interaction Design, their College of Arts and Sciences, all implemented a project based learning and so far it has helped students apply what they learn in the classroom into the real world, and has landed “successful” jobs compared to Hawaii’s antiquated European based education.

(2) An institution of higher education located in the State; or

Cool

(3) A nationally recognized provider of effective computer science professional development.

Who? Didn’t know they exist. Why don’t we just train students to become generic programmers using Edx?

(c) An entity that intends to enter into a contract or agreement with the department pursuant to this section shall first submit a proposal to the department that, at minimum, shall address how the entity plans to:

(1) Instruct teachers with varying levels of knowledge and experience in computer science;

(2) Provide teachers with concrete experience in hands-on, inquiry-based practices;

(3) Utilize effective practices for professional development;

(4) Emphasize the conceptual foundations of computer science;

(5) Instruct teachers how to effectively teach students in computer sciences, including students from demographic groups that are historically underrepresented in computer science careers;

(6) Adapt its instruction to accommodate the particular needs of teachers in different schools and districts; and

(7) Meet other requirements established by the department."

To sum up my argument for these 7 requests, why would a teacher who knows how to program, who knows the ins and outs of computer science teach for a public school when they are:

1) Going to get paid less than what the industry has to offer;
2) Going to get paid less than what a private school has to offer;
3) Not getting paid enough to live in the state of Hawaii to teach students in the long term

SECTION 3. Chapter 304A, Hawaii Revised Statutes, is amended by adding a new section to be appropriately designated and to read as follows:

"**§304A-A Computer science; curricula plan; credits.** The University of Hawaii shall permit any applicant for admission to a University of Hawaii campus in 2022 or any year thereafter to fulfill:

(1) One high school mathematics unit requirement by demonstrating that the applicant satisfactorily earned one computer science unit; provided that the student also demonstrates that the student fulfilled second-year algebra requirements; and

(2) 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."

SECTION 4. There is appropriated out of the general revenues of the State of Hawaii the sum of $ or so much thereof as may be necessary for fiscal year 2018-2019 to the department of education to fulfill its duties under section 2 of this Act.

The sum appropriated shall be expended by the department of education for the purposes of this Act.

SECTION 5. The appropriation authorized under this Act shall not lapse at the end of the fiscal year for which the appropriation is made. Any unexpended and unencumbered balance of the appropriation made in this Act as of the close of business on June 30, 2021, shall lapse.

SECTION 6. In codifying the new sections added by section 2 of this Act, the revisor of statutes shall substitute appropriate section numbers for the letters used in designating the new sections in this Act.

SECTION 7. New statutory material is underscored.

SECTION 8. This Act shall take effect on July 1, 2018.

HB-2607
Submitted on: 1/31/2018 1:51:57 PM
Testimony for EDN on 1/31/2018 2:00:00 PM

LATE

Submitted By	Organization	Testifier Position	Present at Hearing
Jeannine		Support	No

Comments: