NEIL ABERCROMBIE
GOVERNOR

RICHARD C. LIM
INTERIM DIRECTOR

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

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Statement of

RICHARD C. LIM
Interim Director

Department of Business, Economic Development & Tourism

before the

COMMITTEE ON HIGHER EDUCATION
AND
COMMITTEE ON EDUCATION

Thursday, February 3, 2011

3:15 p.m.

State Capitol, Conference Room 309

in consideration of

HB 1338

RELATING TO THE ECONOMY.

Chairs Nishimoto and Takumi, Vice Chairs Nakashima and Bellati, and members of the Committees. The department supports HB 1338 to appropriate funds for continuation of science, technology, engineering and mathematics (STEM) initiatives including Hawaii excellence through science and technology (HiEST) academy Kauai Community College pilot program; fostering inspiration and relevance through science and technology (FIRST) pre-academy program; robotics and problem-based, applied learning program; research experiences for teachers (RET) program; professional development program for public school science and mathematics teachers; business/education internship and mentorship program; incentives for people who hold degrees in science, technology, engineering, and mathematics subjects to obtain teaching certificates through the University of Hawaii's post baccalaureate certificate in

secondary education program; project EAST continuation and expansion.

Through the legislature, funding to support these important programs was originally created through Act 111 and 271, Session Laws of Hawaii 2007. DBEDT's Science and Technology Branch was tasked to administer these funds, in conjunction with University of Hawaii College of Education and College of Engineering. Additional support for these programs was provided by National Governor's Association, EPSCoR as well as American Recovery and Reinvestment Act.

We request the committee's consideration of amending section 5, pages 5 and 6, appropriating general revenues to "support business/education internship and mentorship program to be expended by the department of business, economic development and tourism" and suggest these activities and funding be instead directed to the University of Hawaii, in an effort to centralize STEM program management.

STEM initiatives are critical to Hawaii's future development supporting a knowledge-based economy, and a key component of the administration's and legislature's shared vision to expand and improve the opportunities for practicing teachers, attract highly qualified individuals to the STEM teaching profession, and better align the State's workforce needs with industry needs – particularly in emerging, new industry clusters.

Thank you for the opportunity to testify on this bill.

UNIVERSITY OF HAWAI'I SYSTEM
Legislative Testimony

Testimony presented before the
House Committees on Higher Education and Education
February 3, 2011 at 3:15 p.m.
By Linda K. Johnsrud
Executive Vice President for Academic Affairs and Provost, University of Hawai'i

HB 1338: RELATED TO THE ECONOMY

Chairs Nishimoto and Takumi, Vice Chairs Nakashima and Bellati and members of the House Committees on Higher Education and Education:

Thank you very much for this opportunity to testify on House Bill 1338 that appropriates funding to the University of Hawai'i for a number of programs: a) the science and technology pre-academy program pursuant to Hawai'i Revised Statutes (HRS) Section 304A-1861, the robotics and problem-based learning program pursuant to HRS Section 304A-1862, and research experiences for teachers pursuant to HRS Section 304A-1863; b) for the development of professional development programs in the science, technology, engineering, and math (STEM) disciplines for practicing teachers; and c) to provide stipends for STEM graduates to pursue post baccalaureate certificates in secondary education. The bill also proposes appropriations to the Department of Education for a "Hawai'i excellence through science and technology academy pilot program" at Kaua'i Community College.

The University of Hawai'i (UH) very much appreciates the support shown for Kaua'i Community College as well as the intent in the various provisions of HB 1338 to strengthen STEM education for students and practicing teachers, and to provide incentives for STEM college graduates who may be interested in pursuing a career in teaching. As noted in the language of the bill, producing more STEM graduates is a vital part of the state's ability to respond to emerging or high growth industries.

Producing more STEM graduates is one of the performance indicators in our strategic outcomes for 2008-2015, and a high priority for the University. This is reflected in our biennium budget operating fund request for 2011-2013. The development of our budget strategy was grounded in our strategic outcomes, and particularly in President Greenwood's three initiatives that include the Hawai'i Graduation Initiative, Project Renovate to Innovate, and Workforce Development and Technology Advancement. Aligned with this, the University is requesting Outcomes Based Funding that holds us accountable for meeting these strategic priorities that address the state's educational and economic needs. Our Outcomes Based Funding request targets an increase in the number of graduates, and also attaches an additional weight for the production of STEM graduates at each campus.

The University's biennium budget proposal also includes program change requests (PCRs) developed by systemwide groups of administrators, faculty, staff, and students and approved by our Board of Regents. Preference was given to PCRs for new and emerging programs that address state needs for an educated workforce, with added consideration

given to programs that spanned campuses and supported the movement of students from two to four year programs.

The list of PCRs in our biennium budget request reflect these priorities and include: a) from UH Mānoa an engineering consortium that partners with community colleges at the pre-engineering and lower division level with a goal of facilitating the flow of transfer students in engineering program; b) from UH Hilo a best practices in STEM education initiative; and c) various STEM-related initiatives from the UH Community Colleges.

While the University appreciates the intent of HB1338 to support STEM education, we urge the legislature to refer to the University's biennium budget request which specifies University priorities in this area. These have been vetted with our campuses and reflect strategic priorities and alignment with capacity and supporting programs.

Thank you very much for the opportunity to testify.

Testimony Presented Before the
House Committee on Higher Education
and the
House Committee on Education

Thursday, February 3, 2011 at 3:15 p.m.
Conference Room 309

Written Testimony
By
Christine K. Sorensen
Dean, College of Education
University of Hawaii at Mānoa

HB 1338: RELATING TO THE ECONOMY

Chair Nishimoto, Vice Chair Nakashima, Chair Takumi, Vice Chair Belatti, and Members of the Committees:

My name is Christine Sorensen, current dean of the College of Education at UH Manoa. The College of Education supports HB 1338, Relating to the Economy. I am here today to provide the committees with additional information and to recommend friendly amendments on sections 6 and 7 that relate specifically to the College of Education.

As drafted, HB 1338 echoes the Legislature's intent to improve science, technology, engineering, and mathematics (STEM) education in the state and in turn positively impact workforce development in STEM related fields by supporting experiential learning initiatives through Acts 111 and 271. The College of Education participated in Act 111 efforts in two components: 1) providing professional development to K–12 teachers and 2) in recruiting and supporting individuals who graduated from college with a degree in science or mathematics to become licensed teachers.

We provided the Legislature with reports on the Act 111 supported COE efforts and outcomes of both initiatives in 2009 and 2010 (*Report on STEM Professional Development and Status of the Transition to Teaching program, November 2008; Report on the Implementation of the STEM*

Professional Development Programs for 2009, Act 111, Section 15, SLH 2007 (SB 885 SD2 HD3 CD1), December 2009).

STEM Professional Development
Act 111 provided $175,000 in each year of the 2007–2009 biennium to establish a professional development program for practicing elementary, middle and high school teachers of science and mathematics with opportunities to increase their knowledge and understanding of recent developments in science, technology and mathematics and improve their ability to provide inquiry-based education.

With the FY 08 funds, intensive training was provided to 20 elementary and 6 secondary mathematics teachers, and 175 elementary and 75 secondary science teachers, impacting an estimated 3,800 elementary and 7,800 secondary students. FY 09 funds provided training for 111 math teachers and 125 science teachers, impacting an estimated 5,208 elementary students 11,200 secondary students. Late release of the funds in March of both years of the biennium likely reduced the number of teachers that could be recruited and participate. By March/April each year teachers have generally already made plans for professional development they attend in the subsequent summer.

There were no additional funds appropriated or released in 2010. Despite reduced funding, the Curriculum Research and Development Group (CRDG) of the College of Education continues to provide professional development opportunities, funded primarily by grants obtained by CRDG faculty. Both mathematics and science faculty continue their work with HIDOE and charter schools statewide. We can provide specific data on their efforts at the committee's request.

Transition to Teaching Program
The Transition to Teaching (TTT) program was established within the COE in 2003 with a five-year grant from the U.S. Department of Education. The TTT program provided support for individuals who graduated from college with a degree in a subject area other than education and wished to pursue a teaching career in science or mathematics through the COE Post-Baccalaureate Certificate in Secondary Education (PBCSE) Program. Before this federal grant expired in 2008, the Legislature appropriated $175,000 for each year of the 2007–2009 biennium to the COE to continue the TTT program. FY08 funds for TTT were not released until March 2008, reducing the College's ability to recruit and prepare STEM teachers. Despite the late release of funds, the Office of Student Academic Services received over 100 inquiries and identified 18 qualified applicants in science or mathematics that met the admissions criteria for entry into the PBCSE program. Of those 18 qualified applicants, 15 were accepted into the TTT program. FY09 funds were never released.

The TTT program has made significant contributions to the teaching profession throughout Hawai'i. For the past few decades, there has been a shortage of qualified and licensed mathematics and science teachers in the HIDOE, particularly in rural areas. In response to this need, the TTT program has offered a viable solution to alleviate these challenges by implementing a comprehensive support program that consists of tuition stipends through the

PBCSE program, PRAXIS test preparation support, access to the program through hybrid delivery models using both face-to-face and technology based instruction, professional development workshops, and mentoring support. Unfortunately, the TTT program has been discontinued due to lack of funding.

Need for STEM Professional Development

Common Core State Standards—Legislative support to continue these two programs is needed more now than ever. The state's recent adoption of Common Core State Standards (CCSS) in mathematics, with science expected to follow in 2012, will require a significant increase in professional development and funding for over the next five years. Because implementation will require substantial teacher content knowledge upgrades and changes in methodology and approaches to teaching, as well as the adoption of new curricula, a system wide effort in professional development impacting all K–12 mathematics and science teachers must be launched. Implementation of mathematics CCSS is beginning this month to be followed by science in Spring 2012. The College of Education is working in partnership with HIDOE on designing and implementing professional development in support of CCSS.

Highly Qualified Teachers—Another ongoing issue is how to support teachers to become highly qualified by federal definitions. For example, there are 251 science teachers statewide who are not considered highly qualified based on federal standards. Additional professional development is required to bring these teachers into compliance and provide ongoing support for future teachers to become highly qualified.

Friendly Amendments to Section 6

Given the extensive impact of the COE-provided professional development under Act 111, we respectfully suggest lines 11–12 specify that the funds are to be expended by the College of Education, and more specifically by the COE's Curriculum Research & Development Group, to ensure that the unit within the University most capable of designing and providing the necessary professional development programs receives any appropriation for this purpose.

Regarding a permanent appropriation for this part, and realizing the current fiscal crisis, we recommend an appropriation totaling $350,000 ($175,000 per year) to continue this work. While much more funding is needed to address the STEM professional development needs, there are other funds available and we are pursuing them. An appropriation by the Legislature will be leveraged for optimal effect.

Friendly Amendments to Section 7

Similar to the recommendation to amend Section 6, we respectfully suggest that lines 21–22 specify that any appropriation for the TTT program be expended by the College of Education, as the primary provider of mathematics and science teachers in the UH system and with the largest alternative routes to teacher licensure through post-baccalaureate and masters programs in the state.

In light of the TTT program's past success and the benefits to STEM education and workforce development, we recommend biennium funding totaling $350,000 to continue this work ($175,000 per year).

As in all such cases of legislatively initiated support to the University, our support for these items is contingent upon appropriated funding which does not supplant UH priority biennium budget requests.

Thank you for the opportunity to testify.

Personal Testimony Presented Before the
House Committee on Higher Education
and
House Committee on Education

February 03, 2011
3:15 p.m. – Conference Room 309

by

Peter E. Crouch, Dean
College of Engineering
University of Hawai'i at Mānoa

HB1338 – RELATING TO THE ECONOMY

Chairs Nishimoto and Takumi, Vice Chairs Nakashima and Belatti and Members of the Committees

I appreciate the opportunity to provide testimony in general support of HB 1338 relating to the economy.

The UH College of Engineering has been an active participant in K-12 outreach in the areas of science, technology, engineering, and mathematics (STEM) in Hawaii. Our involvement is driven by the critical importance of generating student interest in pursuing courses of study which lead to postsecondary access and STEM careers.

Our faculty, students, alumni, and staff sponsor and support events such as the UH College of Engineering Day, Engineering Expo, High School Research Internship Program, Junior Engineering Expo, various Robotics competitions, and the like.

Of particular interest to this bill is the Fostering Inspiration and Relevance through Science and Technology Pre-Academy which was established through ACT111 by the State of Hawaii 24th Legislature in 2007. The FIRST Pre-Academy is a teacher driven model for advancing science and technology in middle schools. It brings the knowledge of engineering and technological research innovation into middle school classrooms and programs through the active involvement of teachers, faculty, graduate and undergraduate students and industry. The approach is to: 1) capitalize on the creators of leading edge technology at the university, 2) leverage exciting and mutually beneficial partnerships and funding opportunities, and 3) execute rapid dissemination and implementation of teacher resources and opportunities directly into the classrooms.

Since reporting at the end of June 2010, the number of participating schools has increased from 57 to 68 (85% school participation state-wide); teacher participation has increased from 176 to 308; and students impacted increased from 4,512 to 9,063.

We are committed to working together to promote student interest and improve achievement in science, technology, engineering, and mathematics. We believe this in turn will contribute significantly to preparing our students for fuller participation in our society and contribute to our State's growth.

I wish to add that while we continue to strongly support these programs, the current and projected budget restrictions for the University of Hawai'i at Mānoa require us to make difficult and sometimes unwilling choices. While many programs, especially those in HB 1338, are definitely worthy, we realize not all can be funded, and we must make our decisions on the basis of campus priorities. This is defined in the Board of Regents approved budget. In this respect, we are able to support the concept proposed in HB 1338 at this time.

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Personal Testimony Presented Before the
Committee on Higher Education
Committee on Education

February 3, 2011 3:15 p.m.
Conference Room 309

By
Justin Akagi, FIRST Pre-Academy Program Manager
College of Engineering, University of Hawai'i at Mānoa

HB1338 – RELATED TO THE ECONOMY
Chair Representatives Nishimoto and Takumi and Members of the Committees

My name is Justin Akagi, FIRST Pre-Academy Program Manager at the University of Hawaii, College of Engineering.

I appreciate the opportunity to provide testimony **in support of HB1338** to appropriate funds for science-, technology-, engineering- and math-related programs.

As a product of the State of Hawaii public school system at all levels, from kindergarten through graduate school (1988-2008), I believe that I can provide a useful perspective on Hawaii's education system and the importance of programs such as FIRST Pre-Academy. Throughout my years as a student, I have experienced first-hand and witnessed second-hand how meaningful curriculum can better motivate and educate students. As a student, I admit that I carried a strong interest in math and science throughout elementary and middle school. However, my first meaningful career-related experience was at the high school level in a course that included hands-on activities, such as bridge building, catapult launchers and robotics competitions. Although I was fortunate to have this experience, which inevitably motivated me to pursue undergraduate and graduate degrees in engineering, I also understood that many other students did not have the same opportunity, since the course was taught at a single school by a single teacher.

After finishing my graduate studies, I started working for the UH College of Engineering and have had the pleasure of managing the FIRST Pre-Academy program. This program has a vision of developing Hawaii's future high technology workforce and preparing students for 21st century careers by creating a pipeline from the K-12 system to University and beyond. By improving middle school teachers' technical knowledge and research-based skills across a broad spectrum of science, technology, engineering and mathematics (STEM) disciplines, they are able to more effectively engage and educate students in all aspects of STEM. Teachers are exposed to state-of-the-art technology, research areas and applications through direct interaction with university researchers and industry professionals. In turn, they have been able to introduce their students to a broad range of STEM-related topic areas, including sustainability, 3D modeling and fabrication, aquaponics, water quality, data collection and analysis, robotics, microbial oceanography, creative and digital media, and many more.

In the year that I have been involved with this program, I have witnessed huge growth and impact at participating FIRST Pre-Academy schools. During the past six months alone, this program has grown from 57 middle schools, 176 teachers and 4,512 students to 68 schools, 308 teachers and

9,063 students. And, student involvement numbers are still growing. Based on participating schools' plans, by the end of the 2010-11 school year, more than 10,000 students will be involved in FIRST Pre-Academy activities annually.

I would also like to re-iterate that 68 middle schools are involved with FIRST Pre-Academy. This represents 85% of all public and public charter middle schools in the State of Hawaii, a testament to the success and critical importance of this voluntary program. (Please note that although we encourage all public and public charter middle schools to participate in this program, each school's participation is entirely voluntary.)

As an individual who has graduated from Hawaii's public school system and seen the impact of a program that promotes STEM education, I would like to encourage the State to continue its commitment to STEM learning by supporting HB1338 so that we may continue to impact more teachers and students in the years to come.

Thank you for the opportunity to testify.

Written Testimony Presented Before the
House Committee on Higher Education
House Committee on Education

February 3, 2011, 3:15 p.m.
Conference Room 309

HB1338 RELATED TO THE ECONOMY

By
Sean Fox
Managing Partner, New Horizons of Hawaii

Chair Nishimoto, Chair Takumi, Vice Chair Nakashima, Vice Chair Au Belatti and committee members:

Testimony in support of HB1338.

Thank you for this opportunity to provide testimony on SB 1120 to appropriate funds for science, technology, engineering and math related programs.

New Horizons of Hawaii is the premier computer training company in Hawaii. After 10 years of teaching and working with Hawaii's businesses we have an understanding of the needs and limitations of Hawaii's workforce. Feedback from Hawaii's businesses is that their employees need continued education to help them be competitive.

As a parent, my daughters were fortunate enough to take part in a science program at their public school. The 30 children that have gone through this program are all continuing to excel at science and looking at careers in that field. However, only 30 out of 1,200 students were able to take part in this program. Programs detailed in HB1338 can help build programs like this for all students.

Thank you for the continued support of education and workforce development and support for the industry.

Sincerely,

Sean M. Fox
Managing Partner
New Horizons of Hawaii

Written Testimony Presented Before the
House Committee on Higher Education and and
House Committee on Education
February 3, 2011, 3:15 p.m.
Conference Rm 309

by
Judith Inouye
Teacher Facilitator
FIRST PreAcademy RET

HB 1338 RELATED TO THE ECONOMY

Chair Nishimoto, Chair Takumi, Vice Chair Nakashima, Vice Chair Au Bellati and committee members:

I am writing this to express my strong support for HB 1338

Thank you for this opportunity to provide testimony on HB 1338 to appropriate funds for STEM (science, technology, engineering, math) related programs.

I am very grateful for your previous support through Act 111 and ARRA which allowed us to develop and promote a **unique teacher driven model**. This model allows us to have a very close relationship with teachers such that their needs to impact middle school students are met in a fairly short time.

Here is one example. In June of 2010 a Maui teacher told us that she wanted to learn more about aquaponics. In October we had a workshop at Windward Community College where Dr. Clyde Tamaru of CTAHR not only gave an excellent research based presentation but also allowed teachers to have an on-site tour of his aquaponics research facility. In November and December we provided aquaponics units to teachers at 16 schools on Kauai, Maui, Oahu and Hawaii for developing hands-on lessons covering major STEM curriculum areas. In January, Brandt Like, Kalakaua science teacher and his students developed a desktop aquaponics unit for presentation at the Farrington Complex Science Fair to be held this month. The turn around time from the idea of a teacher to student impact was less than 6 months. It involved professional and industry support to make this happen.

Our workshops are proving to be an effective means by which we can meet the needs of teachers. We had four in the 2009-2010 SY and two thus far for this school year. Two more for this year are in the planning stages. The last workshop held on January 22 involved Problem Solving Methodologies. 50

teachers from 24 schools, 11 from neighbor island schools participated in the workshop. The agenda included a tour of five UH College of Engineering labs as well as presentations focused on research methodologies. Two outstanding retired science teachers, Edith Watanabe and Barbara Rogers provided some "how to" support for middle school teachers who are being encouraged to do more project based activities in their curriculum. Also included in the workshop agenda was a strong focus on engineering problem solving methodology, an area that is becoming more and more significant in our society where engineering has impacted so much of our lifestyle. Through the mentorship of Dr. Scott Miller, UH College of Engineering, fourteen schools are now participating in an engineering design process follow up activity which will involve external review by individuals with expertise in the process.

The workshops are not the only means by which our program is meeting the needs of teachers. Another teacher driven aspect has involved mentorship on a per teacher / per school basis. Currently James Ah Heong, an engineering student intern is working with the Mililani School 6th grade teachers on having students make an electromagnetism device. Very early in our project, a Keaau Middle school teacher asked and through the help of UH College of Engineering graduate student developed an activity where students made their own antennas and tested them using a software program. Russ Ogi, of Rapid Printing, an industry presenter at our 3D Workshop is now working with a Maui teacher who wants to learn more about Maya.

At the 3D Workshop held in May, 2010, a cutting-edge software, Fabware, was presented to the teachers. This software has been installed in all FIRST PreAcademy RET computers and was piloted at several schools in the 4th quarter. Nohea Goo, math teacher at Dole reported that her students were "fighting" about who had the correct solution to some math problems. This is the first time she has seen such excitement over math problem solutions. She also remarked that one student told her that she should have allowed them to work on the software before they took the HAS test and that he might have been able to do better if she had done so. I believe that as more schools implement this software, we may be able to see some significant desirable performance outcomes.

In this model, it is important to listen to the teachers and provide as needed and to the best that we are able to. The outcome has been a very enriching diversity of mini project implementations. And most important, by so doing we have enhanced the professionalism of teachers. Teachers are encouraged to share their curriculum on SIP (STEM Intercommunity Portal).

We now have 43 middle schools throughout our state participating in FIRST PreAcademy RET. 18 of the 43 schools are neighbor island schools. Funds provide opportunities for the teachers at the 18 neighbor island schools to attend the workshops. Margaret .Magonigle of Hana, Maui drives 2 hours to Kahului

Airport and Arlene Uehara of Honokaa 1 hour to Hilo Airport to attend the workshops because they want to learn more on topics that are interesting and important to them. It has given us a tremendous feeling of satisfaction to know that the students in Hana and in Honokaa are being given the same opportunity to participate in aquaponics and engineering process design activities as their counterparts in our larger Oahu schools.

In a short time the RET program expanded from one school to 43 middle schools statewide. The expansion has involved not only more schools coming on board but also more teachers coming on board through significant expansion within a school. Teacher interest in participating in this teacher driven model is spreading! Some of our larger schools, Mililani, Dole, Kalakaua, King, and Waipahu are close to impacting 100% of their students.

Our observations are showing that students are having a greater zest for learning through teachers who are having a greater zest for teaching! Teachers enter the teaching profession because they want to make a difference and we are often told that the teacher is the key factor. Permanent funding for this **unique teacher driven program** will enable teachers to make a difference!

I urge you to be a part of this process to make a difference by supporting HB # 1338.

Thank you very much.

Dear Education Committee Members,

I support funding of this bill. I am a teacher at Dole Middle School. I have been fortunate to be apart of FIRST Pre-Academy RET program for the last 5 years. I have seen first hand the trials and tribulations of this program. Also, being a 15-year teacher on Maui and Kalihi, I understand the struggles of providing our students the skills to succeed in the 21st century.

The FIRST Pre-Academy RET program has grown and developed into a wonderful program that services the state. The neat thing about this program is that it is teacher driven with the help of experts in the fields. This program is the bridge between cutting edge professors in the STEM fields and the middle school teachers on the front lines. From its infancy to its current statewide status, we have benefited from these relationships. This program has provided workshops, equipment, and expertise to help us impact our students.

Although we have benefited greatly from all aspects of the program, I want to highlight some of the many examples of how this program has helped us. Some of our students were fortunate enough to tour the Engineering labs at the University of Hawaii at Manoa. One student started off wanting to be a lawyer, but after her experiences there she wants to go into medical engineering. Another example is our experiences with the Fab Lab program that was provided by this program. Fab Lab is an interactive geometry based program. Some of our teachers piloted it last year. The students were actually fighting over how to do a Math problem. Some of them said that they wish they had the opportunity to use this before the HSA. Others said that they finally got it. It made Math fun.

STEM education is critical to the success of our students. Without it, they cannot be competitive in academics and the job market. In order for us to compete against foreign countries and other states we must beef up or education in this area. In order for us to level the playing field and give opportunities for all of our children, regardless of economic status, we must increase STEM education in the schools. The only way for this to happen in a consistent intentional manner is through permanent funding of wonderful programs such as the FIRST Pre-Academy RET program.

Thank you for your time.

Kara Nakashima

From: Brandt_Like/KALAKAUA/HIDOE@notes.k12.hi.us
Sent: Wednesday, February 02, 2011 8:09 PM
To: HEDtestimony
Subject: HB 1388 RELATED TO THE ECONOMY

Written Testimony Presented Before the
House of Representatives Committee on Higher Education and
Committee on Education
February 3, 2011, 3:15 p.m.
Conference Rm 309
by
Brandt Like Kalakaua Middle School

HB 1388 RELATED TO THE ECONOMY

Chair Nishimoto, Chair Takumi, Vice Chair Nakashima, Vice Chair Au Belatti and committee members:

Testimony in support of HB 1388 or Testimony in opposition (you'd state upfront for efficiency).

I am in testimony for HB 1388. My students have been provided with 15 Dell Laptops that they use frequently for research, projects, and collaborative projects. Through the use of these laptops I have been able to teach my students how to use technology to increase their academic success. Many students who are apathetic and unresponsive in the class are excited to use a laptop in their education. I have had much success with students presenting their PowerPoint presentations to the class with what they learned in their collaborative groups. These students fail to complete assignments but when they are presenting to the class they are excited and willing to learn. Many of these students frequently use Facebook and Twitter but fail to see the connection to education. Making this connection allows them to use these skill sets to increase their academic success.

In my classroom I also have an aquaponics prefabricated system setup in my room. This system teaches the students about sustainability and growing organic food using fishes and plants. This system bought in support of HB 1388 is critical in teaching our future students about key issues in the future. How will we support our future generations with limited resources such as clean water, land to grow crops, and clean air with an exponentially growing population. This aquaponic system has impacted my students because they have purchased their own units and built their own hydroponic systems at home. It is important to reach the future generations that we teach them the skill sets they will use in their lifetime.

I am a firm believer that we should make this funding permanent and be held accountable

through showcases of student work that it is making an impact to students. Also, it keeps teachers in the classroom because of the turnover rate due to lack of funding in the classroom due to budget cuts.

Thank you for this opportunity to provide testimony on HB 1388 to appropriate funds for science-, technology-, engineering- and math-related programs.

Sincerely,
Brandt Like

Personal Testimony Presented Before the
Committee on Economic Development and Technology
Committee on Higher Education

February 3, 2011
Conference Room 309

By
Candy Suiso
Program Director – Searider Productions, Wai`anae High School

HB1338 – RELATING TO THE ECONOMY

Chair Representatives Takumi and Nishimoto and members of the Committee

We are writing this letter to express our strong and wholehearted support for House Bill HB1338 requesting permanent funding for STEM experiential learning initiatives. We would first like to thank the committee members in advance for their time in considering our testimony.

As educators in the Searider Productions (SP) integrated journalism and digital media education program at Wai`anae High School, we feel compelled to describe in more detail why we believe the passage of SB 11206 is important for Hawaii.

Many of you are familiar with the success our program. We feel that we have validated the fact that digital media education programs can reach Hawaii's youth, even the most at-risk and disaffected, and prepare them for success in higher education and the workplace. We thank all of you who have helped us in the past with previous bills that have supported digital media education in Hawaii, and are again grateful for your continued support and allowing us to be part of the FIRST Pre Academy.

One of the most important reasons for our success is our belief that all of our kids, like most humans, have an innate desire to tell stories. We harness that desire and involve students in projects incorporating the following activities:

- students must conduct research and capture their findings in writing, activities most similar to traditional academic disciplines such as Language Arts and Social Studies
- students must create final products using the latest digital media technologies with multimedia components including video, audio, web, computer-based design, animation, and motion graphics
- students must work in groups modeled on production-based teams like those found in print and broadcast journalism or creative media industries

We believe that by providing our youth these types of experiences, we are preparing them to become leaders in making Hawaii's diverse innovation-based economy a reality.

Every year we take our kids from Wai`anae to mainland conventions and competitions with kids from all over the US, many from schools in America's most affluent communities. Last year, Hawaii was represented by Moanalua, Maui, and Waimea High Schools as well as Wai`anae Inter, Chiefess Kamakahele & Kawananakoa Middle Schools. Each year, our Hawaii students, many of whom are considered some of the most at-risk in the country, not only hold their own but often win. For our students, this is often an eye-opening, life-changing experience. They really come to believe that they are good at what they do and can perhaps make a career of it.

While our experience and successes have been with creative media production, we believe the same type of success can occur in engineering programs where students both explore problems and design solutions

using technology, scientific inquiry, and mathematical analysis. In our case, we leverage the innate human desire to tell stories and share ideas with others. But we also believe that the innate human desire to solve problems and understand the world around us is just as powerful a motivator for success. We see many parallels between the successful technology-based engineering programs, such as robotics, and digital media production programs such as ours.

A true innovation economy allows a broad range of creative human endeavors to flourish, whether one is telling a story in a new way or coming up with an innovative solution to a vexing problem. And to build this diverse, strong economy for Hawaii in the 21st century, we must encourage our youth to leverage their creative interests, whether those interests involve creative media production, designing engineering solutions, or solving scientific problems.

We strongly support this bill because it encourages all students, no matter what their creative interest, to help create and become successful participants in Hawaii's innovation economy.

L. Candy Suiso	Michael Oconnor	John Allen III	Jason Britt	Na`a Makekau
Program Director	Digital Media	Video Adviser	Journalism	Graphic Design

Written Testimony Presented Before the
House Committee on Higher Education and
House Committee on Education
February 3, 2011, 3:15 p.m.
Conference Rm 309
by
Edith F. Watanabe
Retired Middle School educator

HB 1338 RELATED TO THE ECONOMY

Chair Nishimoto, Chair Takumi, Vice Chair Nakashima, Vice Chair Belatti and committee members:

Testimony in support of HB 1338.

A retired middle school science teacher, I joined the efforts of the FIRST Pre-Academy program which I felt was designed to focus on the classroom teacher as the KEY to achieving student performance in science, technology, engineering and math (STEM). I would like to offer a testimony, supporting this exemplary program for several reasons:

1. The program involves diverse segments of the community: higher education personnel (professors, graduates, undergraduates), business and industry members, experienced, retired science educators, and teachers in the middle school to work toward a common goal: that of increasing student performance in STEM.

2. It is 'teacher driven' which displays a confidence in the professionalism of teachers to identify, augment and enhance program areas that will increase student performance in STEM.

3. It is a comprehensive, interdisciplinary effort to involve ALL middle schools, with a goal of achieving 100% teacher participation. It is impressive in its efforts to reach the classroom teacher--the most important entity in improving student performance in STEM.

4. If institutionalized, the FIRST Pre Academy Program will ensure that needs identified by teachers and addressed will directly impact the goal of improving student performance in STEM.

Thank you for this opportunity to provide testimony on HB 1338 to appropriate funds for science, technology, engineering and math-related programs.

TESTIMONY ON: HB 1338 RELATING TO THE ECONOMY

SUBMITTED BY: JIM SHON

TO: HOUSE COMMITTEES ON HIGHER EDUCATION AND EDUCATION

DATE: Thursday, February 03, 2011

TIME: 3:15pm

PLACE: Conference Room 309 State Capitol 415 South Beretania Street

AGENDA

HB 1338 Status	RELATED TO THE ECONOMY. Appropriates funds for the: Hawaii excellence through science and technology academy pilot program; fostering inspiration and relevance through science and technology pre-academy program; robotics and problem-based, applied learning program; research experiences for teachers program; professional development program for public school science and mathematics teachers; business/education internship and mentorship program; incentives for people who hold degrees in science, technology, engineering, and mathematics subjects to obtain teaching certificates through the University of Hawaii's post baccalaureate certificate in secondary education program; project EAST continuation and expansion.	HED/EDN, ERB, FIN

MEMBERS OF THE COMMITTEES:

I SUPPORT THIS BILL. I also urge the Committees to consider that STEM education is also an important element curriculum for many Public Charter Schools. Please ensure that any funding you provide also be made available to all students in all of Hawaii's public schools.

The Charter School STEM Consortium (CSSC) was formed to assist Hawaii's charter schools in developing their STEM programs for students, to increase student performance, develop authentic accountability and performance measurements, and to build a collective capacity among K-12 schools. The working mission statement is as follows:

> ***To analyze, assess, facilitate, coordinate, service and promote hands-on, integrative "STEM – for – ALL STUDENTS"; improve student performance; provide professional development and STEM leadership for teachers; develop authentic performance measures and greater accountability; and develop partnerships & regional resource centers with STEM providers and other schools.***

THE CONSORTIUM assists schools in objectively assessing their STEM assets and challenges through an innovative **STEM AUDIT**. A **STEM AUDIT** will:

1. Assess the degree to which STEM has been a focus of a school's curriculum.
2. Collect baseline & comparable data to assess the status of STEM knowledge, attitudes, and

education throughout the system, and suggest ways in which the various assets and strengths of individual schools can be partnered and leveraged to improve STEM education in Hawaii.

3. Understand & improve the STEM-Capacity of schools and teachers.

The Founding members of the **CONSORTIUM**, , who are directors of four innovative charter schools (Connections Charter School, The Hawaii Academy of Arts and Sciences Charter School, Kihei Charter School, and West Hawaii Explorations Academy Charter School), are committed to participation in applied STEM activities and provide leadership in developing four key elements of STEM: Implementation of STEM Audits, STEM for SPED Students, STEM applied to Aquaculture and Agriculture, STEM applied to Information Technology, STEM applied to sophisticated wood working and the production of high quality musical instruments, and STEM focusing on highly sophisticated, computer designed and driven multi-disciplinary engineering.

One of the most interesting STEM initiatives is THE MAKERY.

THE MAKERY is a sophisticated multi-dimensional computer controlled fabrication mill that, using computer aided designs, can fabricate products made of wood, plastic, metal, etc. Among its abilities is to produce high quality steel guitars, environmental sensors, and A MAKERY can make...A MAKERY!!!!. It is cutting edge hands-on engineering for teachers & students. It was created by Dr. Neil Scott at the UH.

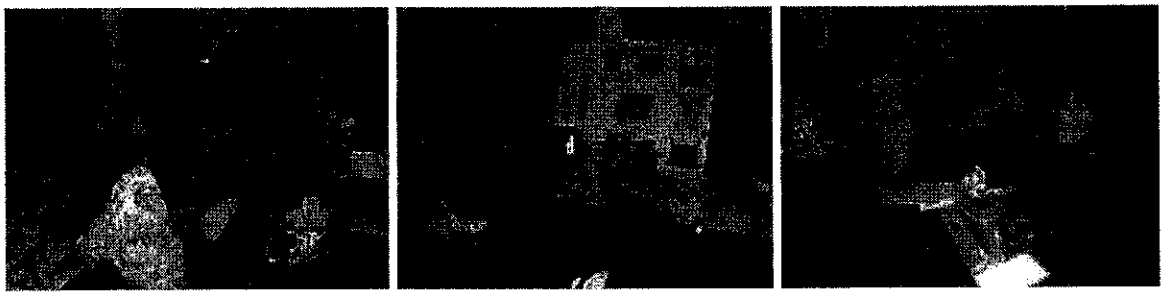
Written Testimony Presented Before the
House Committee on Higher Education and
House Committee on Education
February 3, 2011, 3:15 p.m.
Conference Rm 309
by
Scott Miller, Assistant Professor, Mechanical Engineering, UH Manoa

HB 1338 RELATED TO THE ECONOMY

Chair Nishimoto, Chair Takumi, Vice Chair Nakashima, Vice Chair Belatti and committee members:

Thank you for this opportunity to provide testimony in support of HB 1338 to appropriate funds for science-, technology-, engineering- and math-related programs.

- I have been working with some of the good science teachers in Hawaii including Jeff Lim and Jenny Kuwahara to introduce the concept of engineering and teach the engineering design process to middle school students. We have been refining our approach and made a lot of progress in teaching this concept.
- There is a mounting trend to inform and excite younger students about STEM and engineering design.
- This program will provide teachers with the resources and technical support (working with the College of Engineering at UH Manoa) for new, fun, effective, hands-on projects that engage the students and motivate them toward a STEM related education and career.
- We recently held a workshop to train science teachers in the design process, and they seemed to be sincerely interested. We will put effort into expanding this program with the appropriate funds.
- The figure below shows some of the preliminary efforts at Family Science Night at Kuhio elementary school with the graduate student working on this project.



COMMITTEE ON HIGHER EDUCATION
Rep. Scott Y. Nishimoto, Chair
Rep. Mark M. Nakashima, Vice Chair

Thursday, February 03, 201, 3:15pm Conference Room 309, State Capitol

HB No. 1338
Pertaining to: Workforce Development; STEM Initiatives; Appropriations

Testimony submitted by: Clyde S. Tamaru, Aquaculture Specialist College of Tropical Agriculture and Human Resources, Department of Molecular Biosciences and Bioengineering.

Dear Chair and Committee Members: While I am a faculty member of the University of Hawaii at Manoa in the College of Tropical Agriculture and Human Resources I am providing written testimony as a private citizen and the views presented are not those of the University of Hawaii at Manoa or CTAHR.

I am in support of HB 1338 as it provides support for an invaluable program that provides leadership and training opportunities to our next generation of scholars and professionals that will be required to keep our workforce competitive in an ever changing global economy. Specifically on providing and augmenting educational opportunities particularly in the STEM skills is the major reason for my support of this bill.

If there are any questions please do not hesitate to contact me:

Department of Molecular Biosciences and Bioengineering

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Honolulu, HI 96822

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Personal Testimony Presented Before the
Committee on Economic Development and Technology
Committee on Higher Education

February 3, 2011
Conference Room 309

By **Clint Gima**
Program Coordinator/Teacher – Maui High School

Leilani Green
Teacher – Maui High School

February 3, 2011

HB 1338 – RELATING TO THE ECONOMY

Chair Representatives Takumi and Nishimoto and Members of the Committees

We are writing this letter to express our strong and wholehearted support for House Bill HB 1338 requesting permanent funding for STEM experiential learning initiatives. We would first like to thank the committee members in advance for their time in considering our testimony.

I personally started teaching video production when computer based editing was only found in multimillion dollar facilities and the cameras we could afford were the size of a small suitcase. In fact, Leilani was one of my first students. Also at that time, teachers worked independently and had very little support. Since then, I have met many other teachers from across the State and Nation who share the same passion of providing creative and productive learning experiences for our students through digital media production. However, digital media is not only about using technology. Digital media is about telling stories. Hawaii's rich history is based on storytelling. Hawaii's rich future will be based on the stories from these students. Students learn writing and communication skills while using up-to-date hardware and software to tell stories. In doing so, students meet and exceed the DOE's General Learner Outcomes:

- ***Complex Thinker:*** *The ability to be involved in complex thinking and problem solving.*
- ***Quality Producer:*** *The ability to recognize and produce quality performance and quality products.*
- ***Effective Communicator:*** *the ability to communicate effectively.*
- ***Effective and Ethical User of Technology:*** *the ability to use a variety of technology effectively*
- *and ethically.*

Past FIRST Pre Academy funding has be instrumental in providing non-traditional opportunities for our students. "Our" students include students from Wai`anae High, Wai`anae Intermediate, Moanalua High, Cheifess Kamakahelei Middle, Hilo High, Waiakea High, Baldwin High, Lahaina Intermediate, Maui Waena Intermediate, Lokelani Intermediate, and Maui High School. One of the main uses for these funds were to conduct workshops at Wai`anae High School, the

best high school journalism and digital media program in the Nation. Students received hands on, project based instruction from not only one of the top creative media specialist in Hawaii in John Allen, III, but we were able to bring Les Rose of CBS News for one of our week long training sessions. Les has an extensive resume in journalism, photography, and writing. He produces segments for The CBS Evening News, CBS Sunday Morning, 60 Minutes, 48 Hours, and The CBS Early Show. For almost 6 years he was the photojournalist for the "Everybody Has a Story" series with Steve Hartman, and together they produced more than 125 feature stories. They are currently working together on the "Assignment America" series whenever Steve is west of the Rockies. Les' awards include a Murrow and a DuPont with Steve Hartman, and nine local Emmys. The students were able to work one on one with Les on interviewing techniques and telling the story similar to how Les and Steve develop their stories.

HB1338 will allow us to continue our collaboration and help with the implementation of our common vision of expanding our existing creative media programs throughout Hawaii. Support from HB1338 will allow successful existing programs to expand training to other teachers and their students to develop their own programs at their schools. For example, in April we are going to hold additional training sessions for Hana and Molokai High Schools. HB1338 can be a conduit for our students and the State of Hawaii's economy. I urge you to please support it.

I appreciate the opportunity to provide testimony in support of HB1338. Thank you for the opportunity to testify.

Clint Gima
Maui High School

Leilani Green
Maui High School

Personal Testimony Presented Before the
Committee on Higher Education
Committee on Education

February 3, 2011
Conference Room 309

By
James Ah Heong
Undergraduate Student
University of Hawai`i at Manoa, College of Engineering

HB1338 – RELATED TO THE ECONOMY

Chair Representatives Nishimoto and Takumi and Members of the Committees

My name is James Ah Heong, Undergraduate Student at the University of Hawaii, College of Engineering.

I appreciate the opportunity to provide testimony **in support of HB1338** and the Legislature's commitment to STEM education and technology workforce development.

And these are the reasons why:

- Exposure to science technology engineering and mathematics helps to solidify the understanding of these traditionally rigorous fields of study. The initiative helps to encourage the investment of the valuable time needed to master STEM skills. For example when I was in the 5th grade our class was treated to an opportunity to learn electronics for a week or so. .we were even provided with safety training for soldering. We were ultimately allowed to solder electronic components onto circuit boards and allowed to keep our working projects. After the experience I was quite hooked on electronics and that introduction enticed me to pursue a career in science.

- Having knowledgeable individuals available to supplement the learning of STEM is invaluable. The access to such qualified people allows students to explore subjects on a much more fundamental level, which is crucial to succeeding in the sciences. On a personal note I have been able to work on some of the FIRST projects and I wish that this kind of support was available when I was in middle school. FIRST provides the students with real world experience, some of which could already be put on resumes.

- The type of experience gained from working directly with technology from a young age is irreplaceable. It has been my experience that when working with real technology the motor skills required for dexterous confident operation of high-tech devices becomes muscle memory and allows a great deal more concentration to be expelled upon problem solving and innovation. Trouble shooting skills also become

sharp and natural with experience. These types of skills are very difficult to teach without exposure to environments where the skills are readily used. The FIRST pre-Academy program provides many opportunities for students and teachers to interact and train with modern techniques and equipment. Working with FIRST allows both the teachers and the students to grow in their abilities to interact with various types of technology and to really understand the applications of the science they are teaching and learning.

- Exposure to technology begets the advancement of technology. It is clear to see that technology has advanced out of necessity. It is through the use of technology that shortcomings in the technology are identified and solutions are pursued. I find that I am constantly looking to update my understanding of engineering concepts so that I can better apply myself to my jobs as well as day to day tasks. Take my word for it, if you really want to see what technology is capable of provide hungry minds with the means to advance their capabilities.

- I am profoundly impressed with the great ideas voiced by the teachers I've met when working with the FIRST pre-Academy. Often times the teachers are in need of interaction with individuals who can provide the insight and experience needed to bring their ideas to life. Just the other week I had a great conversation with middle school teachers who want to provide their students with materials so that the students can create their own small electric generators. The quick science project brings to life some of the fundamental laws of electricity. Ideas which took brilliant people decades or longer to solve are now easily accomplished by middle school students when they are given the opportunity to explore. This initiative increases the availability of technology and techniques for students and teachers across the board. The exposure alone is a benefit to the community as it increases public awareness of the worldwide benefits that accompany the pursuit of knowledge.

Thank you for the opportunity to share with you these thoughts and provide this supporting testimony.

Personal Testimony Presented Before the
Committee on Higher Education
Committee on Education

February 3, 2011
Conference Room 309

By
Philip Truong
Undergraduate Student
University of Hawai`i at Manoa, College of Engineering

HB1338 – RELATED TO THE ECONOMY

Chair Representatives Nishimoto and Takumi and Members of the Committees

My name is Philip Truong, Undergraduate Student at the University of Hawaii, College of Engineering.

I appreciate the opportunity to provide testimony **in support of HB1338** and the Legislature's commitment to STEM education and technology workforce development.

And these are the reasons why:

- For a little over half-a-year, I, along other undergraduates, have been working on developing tutorials with the purpose of providing quick reference for teachers and students in the proper usage of electronic measurement probes and PDAs for data collection in lab and field experiments.
- Additionally, in being involved with the RET program, I have been able to further my own understanding of the use of, and the concepts involved in, data collection instruments.
- Through my interactions with teachers, I have been able to observe a genuine interest in participating in the RET program.

Thank you for the opportunity to share with you these thoughts and provide this supporting testimony.