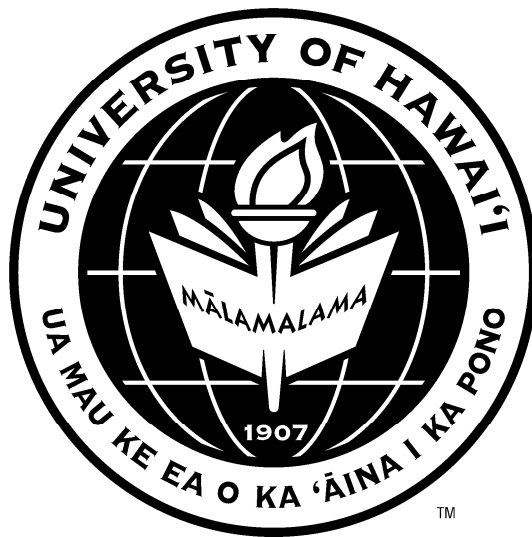


# UNIVERSITY OF HAWAI‘I SYSTEM ANNUAL REPORT



REPORT TO THE 2008 LEGISLATURE

Report on Hawaii Excellence through Science  
and Technology Academy Pilot Program

Act 111 SLH 2007

November 2007

## **INTRODUCTION**

In session 2007 the Hawaii State Legislature passed SB 885 SD2 HD3 CD1, which appropriated \$261,020 to Kaua'i Community College and \$26,730 for the department of education to collaborate on the establishment of a Hawaii excellence through science and technology academy pilot program.

The desired outcome of Act 111 is, "...to increase the readiness and motivation of Hawaii high school graduates to pursue post-secondary training and career options in science, technology, engineering, and mathematics disciplines."

## **BACKGROUND**

### *Kaua'i County and Private Sector Partnerships*

In initial planning discussions among Kaua'i Community College, the Kaua'i Complex Area Superintendent and high school principals, one often voiced concern was to build a model which would incorporate and build upon current STEM activities on Kaua'i and not be perceived as a totally separate project, just "another item on the plate" for teachers. Chief among the current activities are the products of the Kaua'i Team Tech effort.

In June, 2003 Mayor Bryan Baptiste convened a group of community people representing the high tech industry, including PMRF and its contractors, K-12 education and higher education and government to form Team Tech. From that initial meeting the group developed the Adopt-A-School plan and the Kaua'i Economic Development Board (KEDB), one of the major partners in the effort, established the Aloha 'Ike Fund to support innovations in learning K-12. This fund helped establish the EAST video production capability at Chiefess Kamakahalei Middle School and supported local participation in the Botbal competition. Its objectives are:

- Encourages teachers and administrators to expand the education enrichment opportunities for their students;
- Facilitates the application of academic concepts through innovative project-based learning; and
- Develops partnerships with participating companies, institutions of higher learning, and other members of the community.

Another activity involving KEDB, high tech companies and the Kaua'i Workforce Investment Board (KWIB) is the High Tech Career Fair, held annually in February on the Kaua'i CC campus. A particularly successful collaborative effort is the summer internship program that pairs graduating

seniors and college undergraduates with high tech companies and gives them college credit, as well. KEDB has partnered with MEDB to fund Women in Technology summer programs to encourage high school girls to explore tech fields and the College has had Carl Perkins funds through Alu Like to set up similar summer programs for Native Hawaiian students. Finally, an Engineering Week event for all local high schools has been created by General Dynamics and held at the College.

These “pipeline” efforts have contributed to an increase in our Electronics program from 18 majors in Fall 2003 to 31 majors in Fall 2007, despite slightly decreasing enrollment overall. In Fall, 2006 27% of the majors were female, 31% were Filipino and 24% were Native Hawaiian.

### *UH and DOE Curricular Alignment Activities*

A second set of partnerships also currently underway will become a part of the pilot project. Kauai CC math faculty and high school math faculty have reviewed the content and learning objectives of algebra courses in the high school with the equivalent courses (Math 24, and 25) at the college. They had already completed this alignment of the courses before Act 111 provided these new resources. They are now proceeding with articulation and common assessment and reviewing pre-algebra, Math 22. This alignment itself built upon a similar curricular review down by Maui Community College and its partner high schools, supported by the UH system Gear Up program. In addition, all UH Community College math instructors have articulated Math 24 and Math 25 across the UHCC system.

As part of a systemwide articulation effort support by federal Carl Perkins funding, all UH Community Colleges and partner DOE high schools are working on other Career pathway articulation efforts aimed at creating better transitions from high school to college programs. Kaua'i Community College and the three Kaua'i high schools have completed a preliminary matrix matching high school courses with specific Career and Technical Education (CTE) programs.

### **Status of Current Planning**

Upon being informed of the legislation, Kaua'i Community College convened a meeting with Kaua'i Complex Area administrators and teachers along with a community partner, the Kaua'i Economic Development Board (KEDB). At that meeting, a set of joint goals and agreements were developed, based upon the several initiatives already underway in the Kaua'i community, with the similar goal of increasing the numbers of young people interested in and prepared for the career opportunities in the growing science and technology areas. At subsequent meetings we refined those first agreements into the

following description of the Science Technology Engineering and Math (STEM) Academy model we would be working toward.

*STEM Academy Pilot Will Include:*

1. Linkage from 9<sup>th</sup> grade through 12<sup>th</sup> grade, with pathways defined to the middle schools for later development. Math and science foundations set in 9<sup>th</sup> and 10<sup>th</sup> grade to prepare students for dual credit (college and high school) courses in 11<sup>th</sup> and 12<sup>th</sup>.
2. Career and Technical courses as well as general core courses offering dual credit.
3. Contextual and applied learning, STEM skills and concepts will be integrated to reflect real world situations and problems. A theme, such as “Kaua‘i’s Sustainable Future” might be selected to tie academy courses together.
4. Common assessment plans will also link dual credit classes and preparatory classes; these are not “high stakes” single exams, but assessment plans with mutually agreed upon content, assessment strategies and evaluation. CORD curriculum and assessment as well as the COMPASS placement test used by the community colleges will/may be part of the assessment plan. Other external tests such as the Apprenticeship exam, pre-Nursing test, Automotive Service Excellence (ASE) tests will be used as resources for both curriculum development and assessment.
5. Current community resources such as Adopt-a-School partnerships and KEDB’s Aloha ‘Ike will be integrated into the academy.
6. Sustainability of the Academy itself requires commitment to on-going professional development and on-going, collaborative curriculum review, revision and development involving both high school and community college teachers.
7. Focus on “neglected majority” students.
8. The ultimate goal is to produce students prepared to enter and succeed in STEM programs at Kaua‘i Community College and other UH campuses.

All three Kaua'i complex area high schools, Kapa'a High School, Kaua'i High School and Waimea High School, have assigned teams of faculty, at least one math and one science, to the curriculum review and development effort. Kaua'i Community College has two math faculty, the Science and Math Division chair, physical science faculty, and Electronics faculty working on the project. Other teachers are called in as required, depending upon the issues.

The math courses cited above (Math 22, 24 and 25) have been identified as the "gatekeeper" courses in the STEM areas. System wide, almost two thirds of entering students taking the COMPASS placement test are required to complete one or more of these courses before continuing on to college level math or science or entering programs such as Nursing and Electronics. Through these alignment and articulation efforts the teachers are seeking to:

- ❑ Allow students who pass their high school math courses at an agreed upon level to substitute their performance in the course for the COMPASS score, to meet the articulated math pre-requisite for college courses.
- ❑ Establish on-going dialogue among college and high school faculty to continually assess student performance and jointly and regularly consider possible changes needed to improve student success.
- ❑ Create connections among CTE faculty and science and math faculty to ensure

*Planning Steps Completed November, 2007:*

1. Kaua'i Community College and Kaua'i Complex Area develop joint vision of STEM academy
2. Partners define goals and deliverables for planning year
3. Joint high school and college curriculum teams formed for math and for sciences.
4. Team meetings scheduled through December, 2007
5. Content alignment of high school algebra I and II with Math 24 and 25
6. Open discussion with UHM College of Education to establish professional development opportunities coordinated with curriculum review, development and improvement activities

*DRAFT Planning Timeline*

Fall, 2007

- ❑ Mathematics course alignments completed for pre-algebra, algebra I and algebra II
- ❑ Draft quarterly process proposed for adoption by all three high schools and inclusion in Kaua'i Complex area standards tracking process. Review external certification tests to align skills and knowledge expectations and testing with what is taught.
- ❑ Identify “gatekeeper” science courses for possible alignment and dual credit.
- ❑ Identify math skills and knowledge needed in science courses.
- ❑ Review instructional resources to create contextual and applied learning environment in courses, including materials available through other UH and DOE system efforts such as CORD, PBL (problem-based learning) NSF project.
- ❑ Complete planning timetable for 07-08 and agree upon deliverables for 08-09.
- ❑ Reach agreement with UHM College of Education on professional development opportunities for high school teachers, e.g., 400 level courses aligned with curriculum revision/development efforts.

#### Spring, 2008

- ❑ Based on review of instructional materials in the fall, identify and purchase resources for each high school.
- ❑ Finalize quarterly assessment process
- ❑ Sign MOA between Kaua'i Community College and Kaua'i Complex Area to substitute appropriate grade in articulated courses for agreed upon COMPASS placement scores.
- ❑ Identify additional dual credit opportunities in CTE areas for 11<sup>th</sup> and 12<sup>th</sup> grades.
- ❑ Work with community partners to identify ways to integrate such on-going activities as botbal competition and robotics into articulation efforts.

#### Fall, 2008

- ❑ Students at all three high schools enroll in newly aligned 9<sup>th</sup> and 10<sup>th</sup> grade math courses
- ❑ Implement quarterly math assessments
- ❑ Align and articulate CTE courses for dual credit.