LSAMP

Louis Stokes for Minority Participation

IMPACT REPORT

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Foreword

The Islands of Opportunity Alliance (IOA) was formed in Fall 2007. In its short history it has begun to make an impact on the students and the economy of Hawaii and the Pacific region. IOA has learned from its senior brethren among the highly successful Louis Stokes Alliances for Minority Participation, taking on lessons learned and best practices pioneered by them. Many of these practices are geared toward the long term goals of increasing recruitment and retention of students in STEM fields, and increasing the diversity of the STEM workforce. It is remarkable that in the short time since the start of the IOA, clear progress toward meeting these goals has been achieved.

This report includes statistics showing the quantitative achievements of the IOA over the past four years. It also includes more in depth looks at a selection of our students, and how the alliance has made a difference in their lives. The report provides an overview of the economic impact of STEM fields in the region's attempt to diversify its economy, now highly dependent on tourism, and the importance of the IOA in educating the necessary workforce to allow this economic diversification to occur.

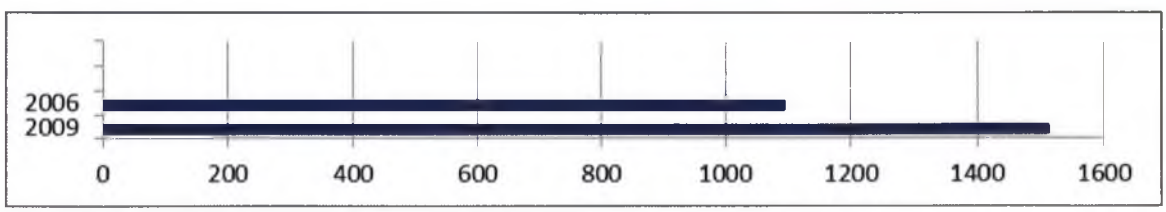
The IOA consists of 18 community colleges and universities covering a geographic area larger than the continental United States, stretching from Palau in the west to Hilo in the east. The lead institution for the IOA is the University of Hawaii at Hilo. The largest institution in the alliance is the University of Hawaii at Manoa, located on the island of Oahu. Other universities in the IOA are Chaminade University and Hawaii Pacific University (HPU) in Honolulu, and the University of Guam. Hawaii-based community colleges (CCs) in the IOA are: Hawaii CC, Honolulu CC, Kapiolani CC, Kauai CC, Leeward CC, Maui College, and Windward CC. Beyond Hawaii, Pacific-based community colleges in the IOA are: American Samoa CC, College of Marshall Islands, College of Micronesia, Guam CC, Northern Marianas College, and Palau CC.

Executive Summary

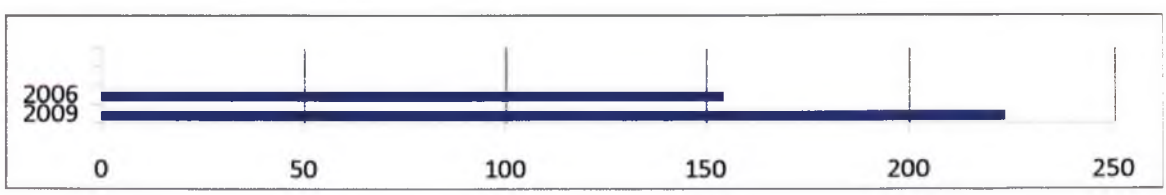
The eighteen-campus Islands of Opportunity Alliance (IOA) joined the national network of LSAMP supported alliances in 2007. This alliance has been particularly dedicated to increasing the numbers of Native Hawaiians and other Pacific Islanders who undertake studies in STEM fields, and succeed in achieving bachelor's degrees in these disciplines. The IOA has sought in its early years to build a pipeline far into the Pacific, attempting to create a seamless connection that permits students from community colleges, four year institutions, and research-intensive universities to find pathways to success. As the Alliance enters its fifth year, these goals remain the same, but we also set our sights on goals beyond the baccalaureate. By aiding these high achieving students to transition into graduate studies and careers in STEM areas the IOA hopes to establish a cadre of well-trained STEM professionals who will offer their expertise to their home communities.

The Alliance has achieved much in a short time, directly supporting 588 undergraduate students from underrepresented minority (URM) groups in their STEM studies, and indirectly assisting many others through the provision of summer bridge programs, tutoring, student work areas, academic advising, and general encouragement. While many of our IOA students are found in the thirteen community colleges within the Alliance, these institutions do not usually indicate specific majors. Thus, many of our statistics refer only to the five baccalaureate-granting institutions in the IOA. In the three years of data reporting since the start of the IOA, enrollment of URM undergraduates in STEM fields has increased by 37.9%, and the number of URM students receiving bachelor's degrees in STEM fields has increased by 44.8%.

Enrollment of STEM Majors from Underrepresented Minority Groups (undergraduates):



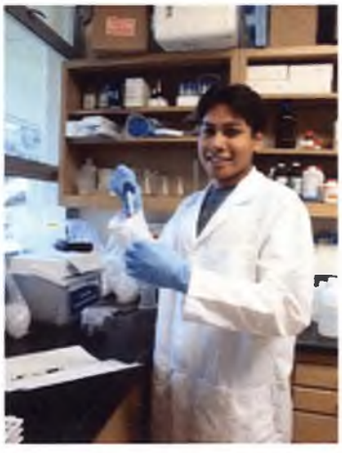
Number of Graduates from Underrepresented Minorities in STEM Fields (Bachelor's degrees):



Highlights/Impact

Introduction

The IOA is set in the broad Pacific Basin, where the state of Hawaii, U.S. territories, commonwealths and federations with special U.S. affiliations enjoy congenial climates and a wealth of natural resources, but are faced with the challenges of geographic isolation and, in some areas, poor STEM infrastructure and underdeveloped STEM-based economic activity. Perhaps the greatest STEM resource of the region is the indigenous peoples and cultures of the islands. Polynesian and Micronesian navigators carried out one of the greatest achievements in human history, performing unparalleled feats of navigation across vast spans of ocean in small canoes, often to minute islands, through use of sophisticated understanding of astronomy, ocean currents, wind, and weather. Islanders devised complex methods of agricultural and aquacultural intensification, and erected large scale, monumental architectural structures for both religious and practical purposes. The IOA has integrated indigenous science into studies of STEM fields, providing a new generation of Pacific Islander scientists and engineers with continuity in their pursuit of new knowledge.

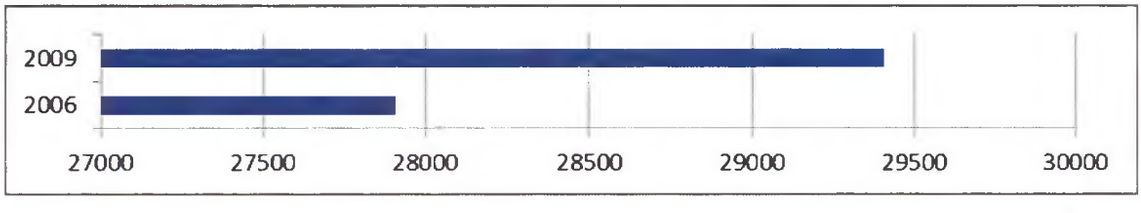


The Hawaii state Department of Business, Economic Development and Tourism recently issued a major report forecasting that science and technology is the key to the future economy of Hawaii. The report states: "Hawaii's continued economic growth in the 21st Century may be determined in large measure by how well we use science and technology to increase our productivity and become a center for technological innovation in the Pacific." Hawaii is a major contributor to environmental science, volcanology, astronomy, marine science, climatology, and biomedical sciences. It is developing stronger capabilities in computational sciences, engineering, and pharmaceutical sciences.

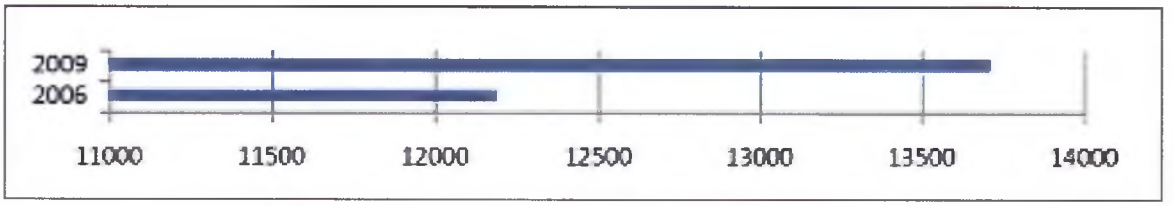
Quantitative Indicators of Impact

For the five universities in the Alliance, the following shows the change in numbers of student enrolled or graduated, from baseline data before the IOA was formed in 2006, to 2009.

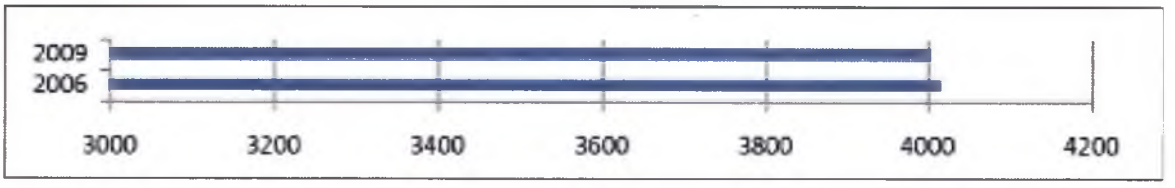
Total Enrollment (undergraduates):



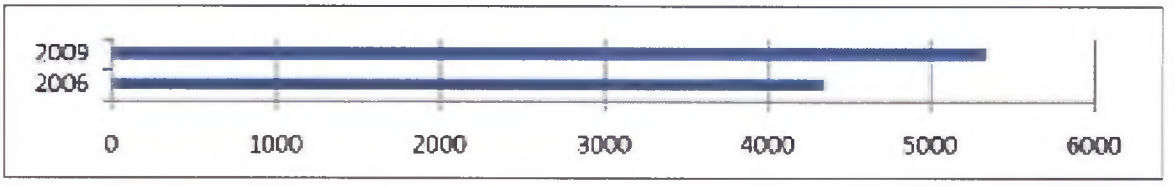
Total Enrollment of Underrepresented Minority Students (undergraduates):



Enrollment of STEM Majors (undergraduates):



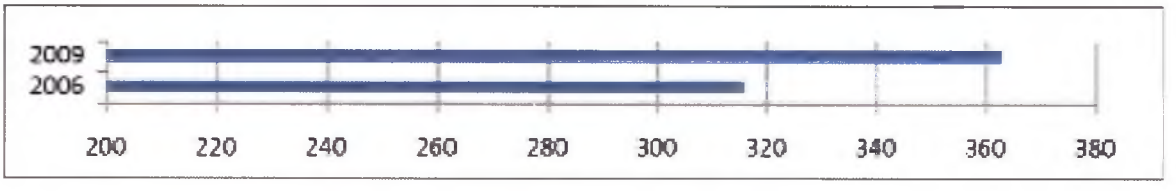
Total Number of Graduates (bachelor's degrees):



The data show that total enrollment in IOA colleges increased by 5.4% in the three year period, while enrollment of underrepresented minorities increased by 12.5%. Enrollment in STEM fields stayed nearly the same but persistence of the students improved: the total number of graduates increased by 22.9%.

Finally, the next graph shows the increase in numbers of URM students earning bachelor's degrees in STEM fields over the reported period. The number of URM students graduating with STEM degrees increased by 14.9%.

Total Numbers of URM STEM Graduates (bachelor's degrees):



Two Student Profiles

Brief profiles of two students, representative of the many IOA students who have benefitted from the alliance activities, are noted here: Joshua Lelemia Irvine and Nakoa Goo.

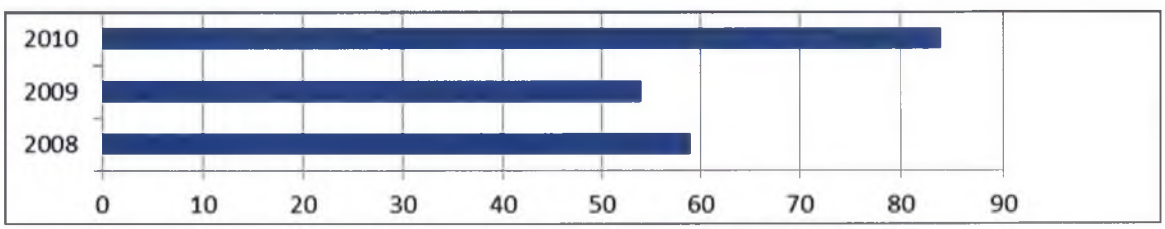
Joshua Lelemia Irvine is a Native Hawaiian PhD Candidate in Civil & Environmental Engineering from UH Manoa. He wants to develop state-of-the-art solutions and solve grand challenges in water quality and security issues. His PhD research will focus on technological advancements to aid the natural water cycle in renovating impaired water supply systems. He aspires to become a research professor, and to integrate his cultural aboriginal knowledge with science and engineering. Joshua states: "Providing access to a clean and adequate water supply is a challenge my generation must confront, especially as population keeps growing and sustained shifts in climate continue. My desire to understand the mechanisms of how things work drove me to research as an undergraduate in wastewater management and resource utilization. For my undergraduate senior design project, I assisted in developing a portable design for pollutant removal from domestic wastewater. My other undergraduate research projects included: modeling the spatial spread of avian influenza, DNA sensors work, and bio-environmental engineering. As a Master's student, I honed and focused in on waste/ wastewater treatment, resource management, and re-use."

Nakoa Goo is a Native Hawaiian graduate of the University of Hawaii at Hilo with a BS degree in Marine Science. Nakoa benefited greatly from the activities in the IOA Keaholoa Scholars program at the university. His experiences included obtaining research experience at the Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian Islands, which serves as a marine and coral reef ecosystem reserve. He presented the results of his research, sponsored by the National Oceanographic and Atmospheric Administration (NOAA), both at annual IOA student conferences and at the LSAMP poster exhibit at the Rayburn Building in Washington. He was one of two undergraduate students invited to participate at the 2nd Annual Tropical Conservation Biology and Environmental Science Student Symposium held at UH Hilo in 2009, where he was awarded a certificate of achievement for his presentation on marine resources at the Monument. After graduation, Nakoa attained the position of Program Coordinator at Mokupapapa Discovery Center for the Hilo office of Papahānaumokuākea Marine National Monument-NOAA where he is responsible for facility maintenance, outreach and education in marine related science activities and technology. Nakoa has returned to support an IOA project as a fish survey mentor.

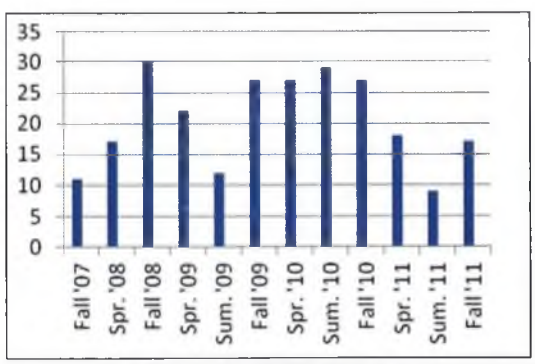
PARTNER INSTITUTIONS

University of Hawaii at Hilo

The University of Hawaii at Hilo is the lead institution for the Islands of Opportunity Alliance. It is a developing campus, with a strong focus on STEM disciplines. In 2010, 28.4 % of its students were majoring in STEM disciplines, and 21.7 % of graduates with bachelor's degrees attained STEM degrees. Students of Native Hawaiian ancestry comprise 22.6% of UH Hilo's student body, while only 27.3 % of its students are Caucasians. The university is a predominantly undergraduate institution, but has two STEM graduate programs: a MS degree in Tropical Conservation Biology and Environmental Sciences (TCBES), and a Ph.D. degree in Pharmaceutical Sciences. TCBES is in the process of expanding to the PhD level. UH Hilo is one of the most diverse campuses in the country, with no ethnic group in the majority.

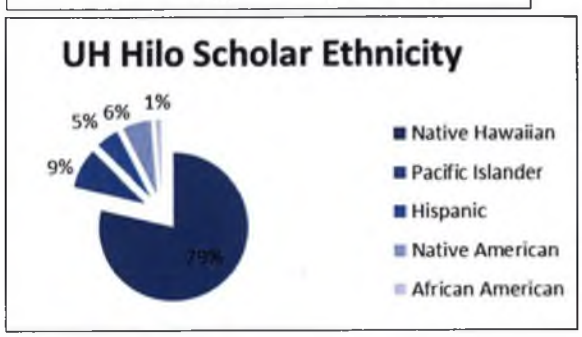


Data are now available on graduates in 2010, allowing an assessment of the IOA's impact on the number of URM graduates in STEM fields over the past three years. These data include students of Filipino-American ethnicity, as Filipinos represent an underrepresented minority in the Pacific region.



IOA-LSAMP Keaholoa STEM Scholars Program at UH Hilo

The Keaholoa STEM Scholars Program directly supported 79 undergraduate students in STEM research experience, conference support, workshops and training, community outreach, and academic support from the Fall 2007 semester to the Fall 2011 semester. Students participated in research experiences on a semester-to-semester basis with most scholars participating in multiple projects over multiple semesters. (See chart, top right)



The Keaholoa STEM Scholars Program supports all minority students but has a majority of Native Hawaiian participation. Over 75% of scholars are of Native Hawaiian ancestry. (See UH Hilo Scholar Ethnicity chart, right).

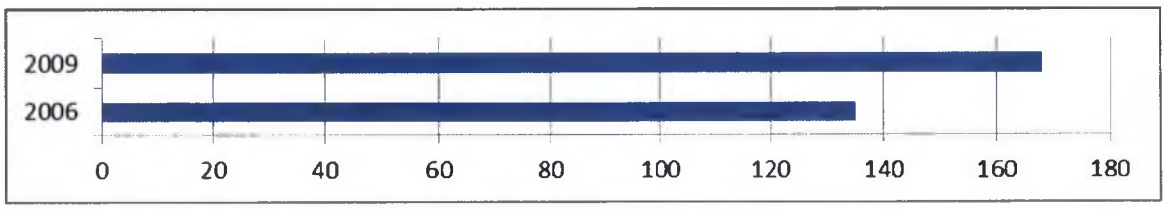
Shauna Kehaunani (Tom) Springer is a Native Hawaiian graduate of the University of Hawaii at Hilo with a MS degree in Tropical Conservation Biology and Environmental Science and a BA in Hawaiian Studies. Her thesis research looked at the cultural use and ecology of opihi (limpet) populations at Kalaupapa National Historical Park. Kehau was an IOA-LSAMP Keaholoa intern and greatly benefited from the program culturally, personally, and professionally. Kehau feels that, "if it was not for the IOA-LSAMP Keaholoa, I would not have been prepared for a career in conservation and would not have had the experiences that helped me through my Master's studies." Along with having been an intern, she is also a mentor for current interns interested in studying opihi and marine resource management in Hawaii. She currently works for Hawaii Fish Trust, Conservation International as a fishing community partnership specialist. All her experiences at UH Hilo, particularly her involvement with the IOA-LSAMP Keaholoa Program, have enhanced her abilities to work with communities in fisheries management.

Kehau Nelson-Kaula is a Native Hawaiian graduate of the University of Hawaii at Hilo with a BA in Biology. She is a current graduate student in the Tropical Conservation Biology and Environmental Science program at UH Hilo investigating the influence of kiawe and milo on nutrient inputs into anchialine ponds. Kehau has presented her research at the Ecological Society of America conference and at various meetings in Hawaii. She has spent two years working on the Hawaii Permanent Plot Network project and in the AmeriCorps internship program for the Three Mountain Alliance watershed partnership.

University of Hawaii at Manoa

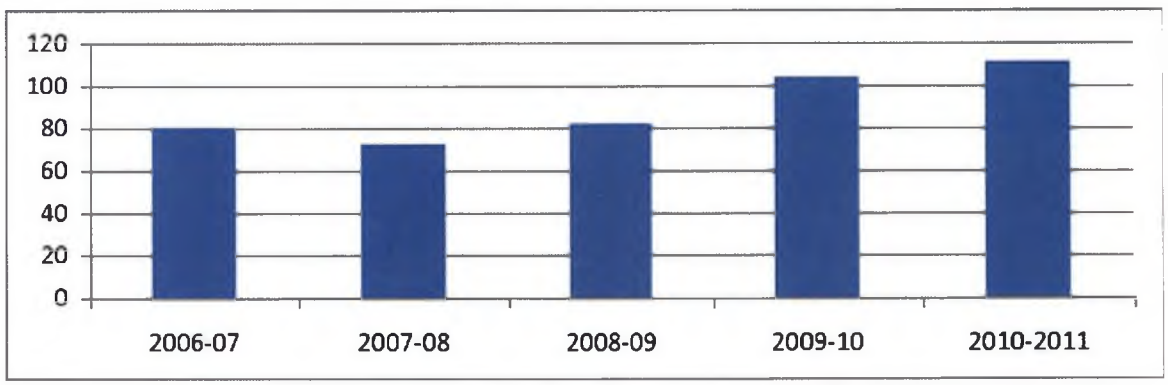
The University of Hawaii at Manoa is the flagship campus of the University of Hawaii system, and the only research-intensive university in the IOA. Manoa's focus within the IOA has been in the College of Engineering, but it has broadened its efforts to all STEM fields. Manoa has an undergraduate enrollment of 14,376 (Fall 2011) and enrolls 5,996 graduate students. Native Hawaiian students comprise 13.6 % of UH Manoa's enrollment, while 24.8 % of its students are Caucasians.

Data comparing URM graduation numbers in STEM fields in 2006 with those from 2009 provide evidence of the IOA's impact on the number of URM graduates in STEM fields over the first four



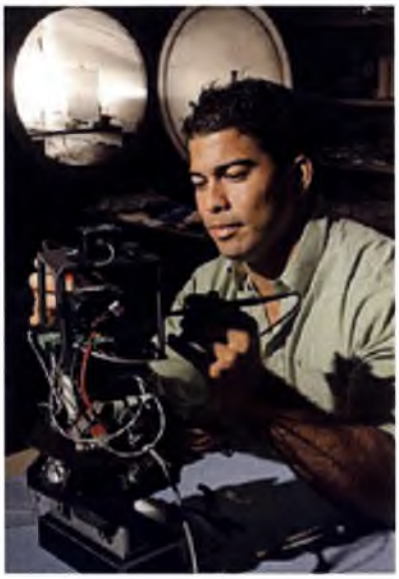
years of the program:

The next graph shows the numbers of direct participants in the IOA from UH Manoa, by year:



A total of 208 students were supported by the IOA, averaging 90 students per year. Of the 208 students, 91 graduated with a STEM degree, and 97 are still enrolled in STEM fields. Of the 91 IOA students who graduated in STEM fields, 78 entered the STEM workforce or entered STEM graduate programs. The 32 IOA graduates who entered graduate programs are all either still enrolled or earned graduate degrees, and the nine students who obtained the graduate degrees have all entered the STEM workforce.

Clifford Kapono is an MS Candidate in Molecular Biosciences & Bioengineering, and a former IOA/LSAMP scholar at the University of Hawaii at Manoa. His research focuses on characterization of peptides derived from marine gastropod venom, with an attempt to derive new drug and pesticide discovery. Clifford obtained much of the motivation to complete his undergraduate engineering studies, and to continue these studies in graduate school, from his experiences as an IOA scholar at UH Manoa. He hopes to demonstrate that one can be both scientist and surfer.



Zachary Lee-Ho is a former IOA student and currently a graduate student in the Mechanical Engineering department and an Attitude Control engineer for the Hawaii Space Flight Laboratory (HSFL) at the University of Hawaii at Manoa (UHM). HSFL aims to provide inexpensive, innovative and responsive small spacecraft that is designed, developed, launched and operated from the Hawaiian islands. He currently serves as the co-lead of the Attitude Determination and Control Subsystem (ADCS) for HSFL project, HawaiiSat-1. His responsibilities consist of implementing the control algorithm and estimator that was developed by UHM faculty, Dr. Amit Sanyal. Other tasks include financial budgeting of the ADCS, converting control and estimator scheme from MATLAB to C language, and the interfacing of ADCS hardware. He worked at NASA Ames in accordance to the Space Act Agreement between the state of Hawaii and NASA. Tasks performed while at Ames include generating C code for ADCS, delegating task to Ames Interns, setting up lab equipment, and assisting in solar panel fabrication and testing.

Chaminade University

Chaminade University of Honolulu (CUH) has an enrollment of about 1,110 full time undergraduate students at its main campus. It has 850 part-time students on military bases in Hawaii and 750 graduate students (at the Masters level). Chaminade has almost doubled its undergraduate enrollment in the last ten years. In the last five years the greatest area of growth has been in the STEM disciplines, particularly in Forensic Science and Biological Sciences.

Chaminade's current student demographics are summarized as follows: 74% of students are women; 50% come from the State of Hawaii, 35% from the continental U.S., and 15% from U.S. affiliated Pacific Islands (American Samoa, Federated States of Micronesia). Chaminade is a federally designated Native Hawaiian serving institution, with 16% of students identifying themselves as Native Hawaiian, and a further 16% identifying themselves as from one of the other native peoples of the Pacific Islands (Samoan, Tongan, Micronesian, etc.). Only 24% of Chaminade's students are white, non-Hispanic. Chaminade has consistently been placed as one of the three most diverse college campuses in the U.S.

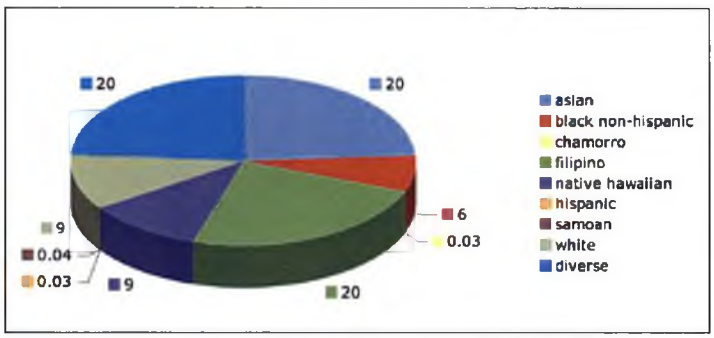
The diversity at Chaminade extends beyond ethnicity. Its student body faces socioeconomic and cultural barriers to success in higher education. Approximately 80% of students exhibit one of the following characteristics, and 50% exhibit at least two:

- Are attending a university more than 500 miles from home;
- Are from low-income families (35% of the student body are Pell-eligible, 80% of Pacific students are Pell eligible);
- Have gaps in academic preparation;
- Are members of ethnic minorities;
- Are first generation college students (over 50% of the student body);
- Have English as a quasi or true second language;
- Are working parents.

Chaminade's prospective students see careers in science and healthcare as highly attractive. For example, among accepted students for Fall 2011, over 49% of students declare the intent to major in either Forensic Sciences or Biology/Health Sciences. This is an astonishing new position for a University that has historically offered career preparation degrees based in the Liberal Arts. Approximately 30% of entering Native Hawaiian students declared an interest in a STEM major. Chaminade has built a robust program of intramural research in the biological sciences in order to enrich a research-based, inquiry-directed, undergraduate curriculum, and provide students with authentic enrichment experiences in the research laboratory. Chaminade research faculty are active (and federally funded) in the areas of environmental toxicology, diabetes and obesity, reproductive health, geoforensics and medicinal chemistry.

IOA LSAMP Activities

The provision of STEM bridge programs to counteract under-preparedness in incoming students is a major goal for Chaminade University. Using IOA funding, CUH provides a six week summer bridge program for students who intend to become STEM majors. The mathematics curriculum of the summer bridge program was designed to assess the students' initial level of competency and provide intensive preparation for the study of mathematics at the college level, as well as address deficiencies in math skills that would preclude success in their chosen science majors. A computer science class was added to elevate the computer literacy of students and prepare their skill set in computer use in a manner appropriate to their proposed entry into core sciences and college algebra courses. IOA funding provided contributions towards housing costs (room and board), program fees and tuition costs, subsidization of tutoring and book costs.



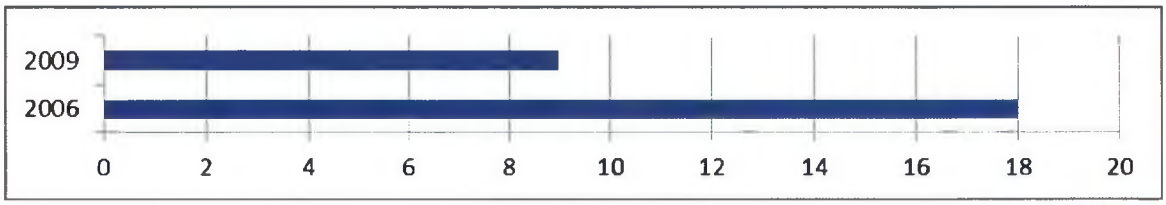
In Summer 2009, 83 students participated in the summer bridge program at Chaminade. The composition of the summer bridge program is summarized below. Of the 62 science bridge students, 37 were first-generation college students, and the ethnic diversity was as follows:

From this group of ethnically diverse students, a cohort was selected for support via IOA on the basis of (a) URM status, (b) financial need, and (c) selection of a science major.

The University of Guam

The University of Guam started in 1952 as a two-year teachers' college, and has since grown into a U.S. accredited land-grant university offering bachelor's and graduate degrees. The university includes a College of Natural and Applied Sciences, where most of the STEM education is centered. The STEM fields are fairly small, with a total of only 241 students enrolled in STEM disciplines, 123 of whom are from URM ethnic groups.

The figure below shows the number of URM STEM graduates in 2006 and 2009 with a drop in numbers, although this is in part due to the small annual numbers that lead to yearly variation:



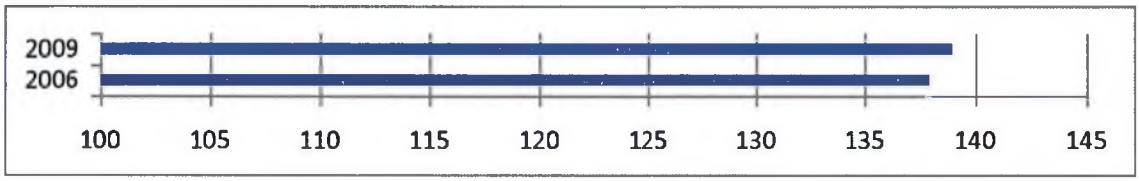
The number of IOA supported students by year was: one in 2007-08, four in 2008-09, and four in 2009-10. IOA students from the University of Guam have been active in summer research programs, including several who have attended the NAPIRE summer program in Costa Rica.

The University of Guam intends to grow their STEM programs, and a goal of the IOA is to help support the success of this initiative.

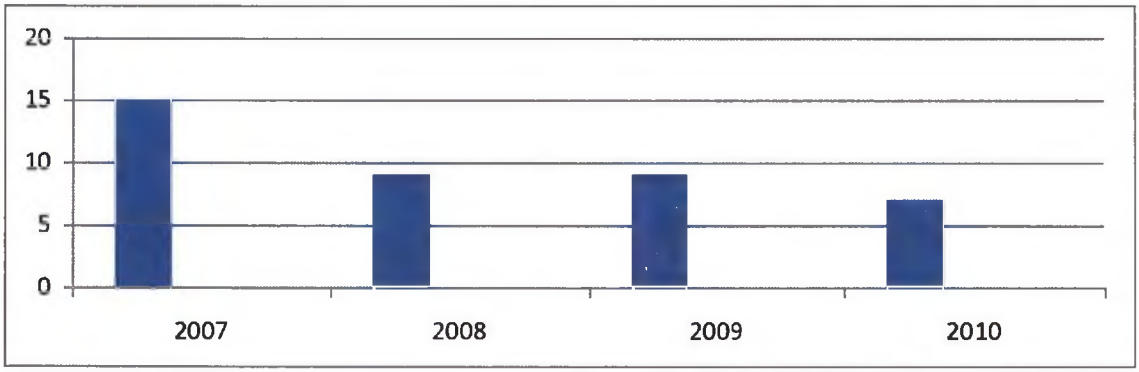
Hawaii Pacific University

Hawaii Pacific University (HPU) is located on the island of Oahu, and is a private university that grants both Bachelor's and graduate degrees. It has an enrollment of approximately 7,000 students. HPU was founded in 1965, and emphasizes small class sizes, individual attention to students, and a diverse faculty and student population.

The figure (right) shows the number of URM students graduating with bachelor's degrees in STEM fields over the three year period of the IOA:



The next figure shows the number of HPU URM students supported by the IOA, by year:

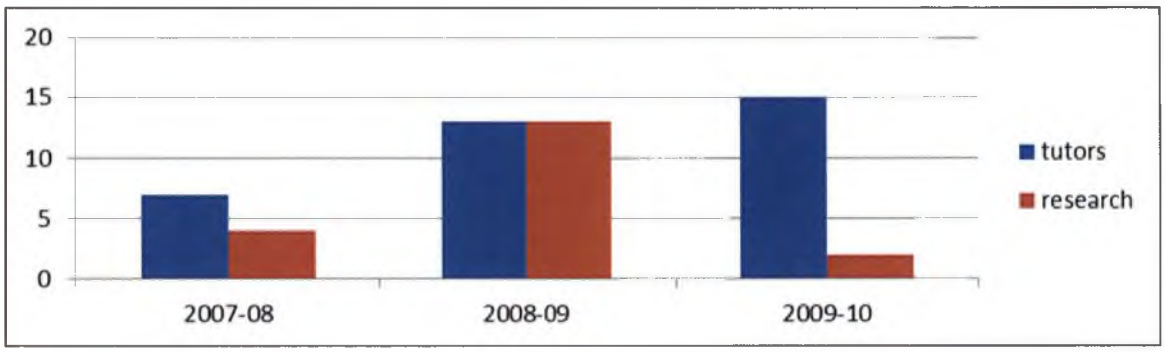


Six of the IOA supported students have received bachelor's degrees in STEM fields, while many are still completing their degrees.

American Samoa Community College

American Samoa Community College (ASCC) was established in 1970 to provide post-secondary education opportunities in the liberal arts, teacher training, vocational-technical education and general education to the residents of American Samoa. ASCC offers Associate of Arts and Associate of Science degrees, as well as Certificate programs in a variety of academic and technical areas.

IOA students at ASCC have taken part in summer research programs, including one in Turkey and another with the NAPIRE project in Costa Rica. The number of IOA supported students at ASCC is shown in the figure (below):



IOA students are supported either as peer tutors in STEM classes or as research assistants. An ASCC student presented her research at the 2010 IOA Annual Student Conference in Honolulu.

College of Marshall Islands

The College of the Marshall Islands was founded in 1989, and is a community college serving the Republic of the Marshall Islands. The main campus of CMI is located on Majuro, the capital of the republic. It has grown rapidly in recent years, and currently has an enrollment of 978 students, all of whom are Pacific Islanders.

The IOA students serve as tutors and teaching assistants. In 2007-08, 25 students were supported, while in 2008-09, four were supported and in 2009-10, one was supported. In 2010-11, ten IOA students were supported. The students take a great deal of responsibility for the running of the math and science computer lab at the college, and the lab has made a real difference in the success rates of students taking STEM courses at the college.

The College of Micronesia – Federated States of Micronesia

The College of Micronesia, whose main campus is located on Pohnpei, Federated States of Micronesia (FSM), is a community college that is dedicated to the development of the workforce for the FSM. There is an enrollment of 2,760 students on five campuses, and nearly all students are Pacific Islanders.

Two students have been supported for research internship experiences by the IOA each year, with the students presenting the results of their research at the IOA Annual Student Conferences.

Guam Community College

Guam Community College serves 2,541 students, with an enrollment increase of over 25% in the past three years. The STEM majors at the college are Computer Networking and Computer Science with a combined enrollment of 136 students. Asian/ Pacific Islanders comprise 93% of the students at Guam CC. The IOA supports STEM students who act as peer tutors, or "success facilitators," helping their fellow students in STEM courses.

Ten students served as "success facilitators" in 2009-10, with one student attending the IOA Student Conference. Two Guam CC students presented the results of their research at the 2011 IOA Student Conference in Honolulu.

Jacob Fathal was a Success Facilitator and a participant in the IOA-LSAMP student conference in summer 2010. He is a Computer Science major at Guam Community College, maintaining a 3.917 GPA. Most recently he was mentored by Dr. John Jenson of the Water Environmental Research Institute (WERI) at the University of Guam. Jacob's project has led him to the goal of pursuing a Bachelor's degree in either mechanical or structural engineering. He intends to pursue a Masters in one these areas and intends to return to Guam and his home island of Yap to help with the infrastructure. His exposure to the sciences through the IOA-LSAMP opportunity solidified his passion for the STEM areas.

Swami is a sophomore Liberal Studies major and has participated in many science activities at the Guam Community College. Most recently he was elected President of the newly established science club. This club was supported by the IOA-LSAMP in order to increase student interest in the sciences. Swami led the science department in its first composting project and has established relationships with the science faculty that have expanded his skills in science techniques. Swami attended the IOA-LSAMP student conference in summer 2011. The conference and the opportunities from the mentorship provided by Dr. Aubrey Moore at the University of Guam further solidified Swami's desire to pursue the Life Sciences and particularly entomology. Swami intends to complete his associate's degree at the Guam Community College and will transfer to the University of Guam. The opportunities presented by IOA-LSAMP have opened doors to Swami academically that he never knew about prior to participating.

Hawaii Community College

Hawaii Community College (HawCC) is located in Hilo, and for some of its programs shares a campus with the University of Hawaii at Hilo. It has experienced rapid growth, with a current enrollment of 3,929, representing an increase of 36 % in the past three years. Hawaii CC IOA students are in the Forestry Program, which trains students for employment in forestry research agencies and to move on to baccalaureate programs in forestry and/or natural resource management.

At the 2011 IOA Student Conference, five HawCC students presented posters on their summer internship projects working in forestry on the Big Island of Hawaii. In 2007-08, three students were supported for summer research experiences, and four students were supported in each of 2008-09 and 2009-10.

The College offered a calculus preparation workshop to IOA students from both HawCC and UH Hilo, as well as other interested students. Students were very pleased with the workshop, and there are indications that attendees raised their math placement scores significantly after attending.

Aaron Kua, (below) is shown with his poster at the 2011 IOA Student Conference. Aaron was born and raised on Kauai, but his desire for a career in forestry has brought him to Hawaii Community College to participate in their Forest Team (right).

Honolulu Community College

Honolulu Community College, located in downtown Honolulu, is a comprehensive community college, offering both vocational programs and two year degrees designed for students who will transfer to baccalaureate institutions. Honolulu CC currently has 4,598 students, 24.7 % of whom are of Native Hawaiian ethnicity; 64.9% of the students are from URM groups.

Honolulu Community college has recently become an active partner in the IOA. For the past two years, the college has supported IOA scholars in the capacity of peer tutors for STEM classes. Eight students were supported in 2008-09, and four students were supported in 2009-10.

Kapiolani Community College

Kapiolani Community College (KapCC) is the largest Community College in the University of Hawaii system, with a current (Fall 2011) enrollment of 9,049 students. KapCC has focused much effort in STEM fields, with a new STEM Center as a showcase on its campus.

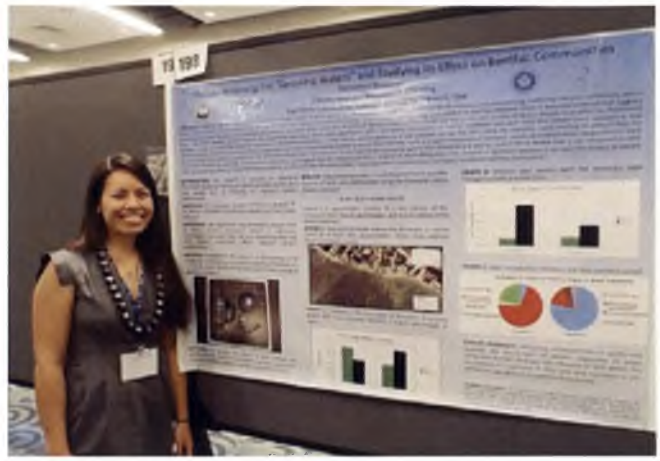
A total of 15 students received IOA funds in the grant period, Fall 2006 to Fall 2011. Another three to four students will be using IOA funds to attend the SACNAS conference in San Jose, CA, October 27-30, 2011.

Native Hawaiian Student Outcomes (N=10)

- One now in the Doctoral Program in Pharmacy at UH Hilo.
- One completed AA degree at KapCC and BS degree in Nutrition at UH Manoa, currently working in the Long-Term Care field, applying for medical school.
- One completed a BS degree in Microbiology at UH Manoa and is working in the Microbiology Department at Diagnostic Laboratory Science, applying for medical school.
- One completed a BS in Microbiology at UH Manoa, currently working as a Lab Tech at John A. Burns School of Medicine, UH.
- Two are currently in the ASNS degree program at KapCC.
- One completed the AA degree at KapCC and the Hawaiian Studies Academic Subject certificate transferred to UH Manoa.
- Two have transferred to UH Manoa in STEM fields:
- One in Computer Science and one in Environmental Science;
- One works at Haleakala National Park in summers
- One student took time to serve on Mormon mission is now back at UH Manoa. She expects to complete a degree in Botany in 2012 and is currently a Science Enrichment tutor at Ke Kula Kaiakuni O Anuenue.

Other Underrepresented Student Outcomes (N=5)

- One African American completed an AA at KapCC and transferred to UH Hilo.
- One Native American completed an AA and transferred to UH Manoa and is pursuing a BS in Engineering there.
- One Filipino completed an AA at KapCC and is pursuing a BS in engineering at UH Manoa
- One Filipina is currently in the ASNS degree program with Pre-med as her degree goal.
- One Japanese American female completed a BS in Marine Biology at UH Manoa, was lead Lab Tech for Algenol Biofuels, and is currently working as Lab Lead Tech at Hawaii Microbial Center.



Kanoelani Steward, (right) has been invited to participate in the 2011 SACNAS conference to present her ongoing research on the submarine freshwater discharge along the coast of Waikiki, Hawaii from historical knowledge of the streams that once flowed through the area. Kanoelani presented some of her earlier findings in February at the 2011 Emerging Researchers National (ERN) Conference in STEM. Having just returned from a recent summer internship in Costa Rica, through the Native American and Pacific Islander Research Experience (NAPIRE) Program, Kanoelani is continuing her research at KapCC through the Spring of 2012, after which she will be transferring to the University of Hawaii at Hilo to pursue a degree in Marine Biology. She interacts closely with KapCC STEM and Social Science faculty and engages dozens of students each semester in environmental service-learning projects in informal science sites as a Service-Learning student leader.

Kauai Community College

Kauai Community College serves the population on the island of Kauai, offering both vocational programs and academic degrees that are transferrable to baccalaureate institutions. It is located on a 200 acre campus near the town of Lihue. Kauai CC has an enrollment of 1,433 students, with 29.2 % of Native Hawaiian ethnicity, and a total of 66.4 % from URM groups. The large campus allows hands-on experience for students, as noted in the photograph at left of a campus agricultural plot. The College has recently become an active IOA partner, with two students supported who worked on applied science projects in 2009-2010, and three students in 2010-11. In addition, the IOA participants conducted a science presentation for a Hawaiian school that was attended by 20 students.

Leeward Community College

Leeward Community College provides two year degrees to many students who transfer to four year programs at nearby universities. The college is located in Pearl City, near Pearl Harbor on the highly urban island of Oahu. Leeward CC started in 1968, and has developed during the intervening years while the character of its surroundings transformed from a rural to urban setting. It serves 7,893 students, 68.5 % of whom are from URM groups, with 24.8 % of the students of Native Hawaiian ethnicity. Leeward CC has a Bio-Tech Lab, created through extramural funding, that provides opportunities for students to engage in undergraduate research in areas such as DNA studies, in addition to providing workshops for other community college instructors and local industries during the summers.

Leeward CC has recently become active in the IOA, with three students presenting results of their research projects at the 2009 Student Conference in Hilo. The photo at right shows some of the student and faculty participants at the 2009 Student Conference, during an excursion to Volcanoes National Park; Kilauea's ongoing eruption in visible in the background.

University of Hawaii – Maui College

The University of Hawaii Maui College is currently a community college, but plans on offering selected bachelor's degree programs in the near future. The college currently has an enrollment of 4,529 students, with 66.6 % of students from URM groups, and 25.8 % of the students of Native Hawaiian ethnicity.

Maui College uses IOA funds to support internships: four in 2007-08, three in 2008-09, and three in 2009-10. In addition, 12 students in 2007-08 were involved in community outreach activities to K-12 students about studies in STEM fields. Each year several STEM scholars travel to UH Manoa to investigate possibilities for transfer into baccalaureate STEM programs; four traveled in 2007-08, ten traveled in 2008-09, and seven visited UH Manoa in 2009-10.

Northern Marianas College

Northern Marianas College is a community college located on the U.S. Commonwealth of the Northern Marianas Islands. It was established in 1981, and seeks to assist its students to obtain higher education in a highly multicultural environment. The main campus is located on Saipan, and there are education centers located on the islands of Rota and Tinian. The College's enrollment in Fall 2010 was 987 students.

Students from Northern Marianas College have been active participants in the IOA. The photo at left shows two NMC students, Jan Reyes and Sharisse Rivera, enjoying an excursion to a Hawaiian fishpond during the IOA Student Conference in 2011 in Honolulu. They both intend to transfer to UH Manoa to study Natural Resource Management.

Palau Community College

Palau Community College was established in 1969, originally with a small group of students enrolled in a single vocational program. The College now has 726 students enrolled in three different schools (Arts and Sciences, Business, and Vocational Studies). All but eight of the students are Pacific Islanders.

Palau CC has leveraged resources from other programs to allow IOA students to be involved in many activities. The major activity provides summer research experiences, with students presenting their work at various conferences. The college presents STEM-related workshops for the IOA students. In 2007-08, 15 Palau CC IOA students were supported for research experiences, while nine were supported in 2008-09 and nine in 2009-2010. The college has used leveraged resources to provide other students with research experiences as well, and three of their IOA students each year travel to the annual IOA Student Conference to present the results of their research.

Students have also presented results at other conferences, including the 2011 Emerging Researchers National (ERN) Conference in Washington.

Windward Community College

Windward Community College, located in Kaneohe, Oahu, serves 2,706 students, 66.3 % of whom are from URM groups, and 42.4 % are of Native Hawaiian ethnicity. The college offers both vocational and academic degrees, and has recently developed STEM initiatives to make that an important focus of their academic programs. Windward CC offers two different certificates in Bio-Resources and Technology, as an example.

IOA has supported Windward CC STEM students in research experiences: four were supported in 2007-08 and six were supported in 2008-09. In addition, 27 students were involved in a fishpond restoration (aquaculture) project in 2008.

IOA LSAMP Students at Work