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Artist Byron Inouye created the journal logo. He combined Asian and Pacific themes using a design element to create a lotus blossom. The waving pages beneath the blossom symbolize academic scholarship and also call forth the Pacific Ocean. The opening lotus is symbolic of new knowledge and insights resulting from research.

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PACIFIC EDUCATIONAL RESEARCH JOURNAL

The *Pacific Educational Research Journal* is published annually and features theoretical, empirical, and applied research with implications for and relevance to education in the Pacific area.

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Editors' Notes

As we strive to publish the *Pacific Educational Research Journal* (PERJ) on an annual versus biennial basis, we are very pleased to present to you PERJ Volume 11 in 2001, just one year from the 2000 publication of Volume 10. Such seeming mastery of time is one of the things that brings joy to the lives of journal editors.

Also a source of joy for us is the diversity of this volume's articles, each with its particular challenges and unique offerings. In the first article, Awaya and Tamura provide an intriguing, document-based view of the beginnings of the major university in the state of Hawai'i. With its mix of old sources and new emphases on proper spelling of Hawaiian words, their manuscript was indeed an editorial challenge.

In the second article, Iding and Chinn document that the world of science can be alien to young students, especially if the role models and instructional strategies are dissonant with the learners' culture. With this being a problem perhaps more so in science than in other fields, their work has notable potential to make a difference where it is especially needed.

Kawakami and Aton's research addressed a well-known concern—the relatively poor performance of Native Hawaiian students in educational settings. But rather than just collect data that support the lament, the authors derive specific strategies for improving upon the situation.

Berg and Berg provide for the first time hard data on a relatively large population being schooled in the public schools of Hawai'i. Their approach was ingeniously opportunistic. In the recent past, the data on military connection of students in the Hawai'i schools were collected but not linked to other data from the schools. Also for the first time, data were available on the relatively serious offenses committed by students at each of the schools in the system. By linking these two data sources together, the authors were able to provide hard data on what is actually happening, in terms of drug use and violence, to military dependents in Hawai'i schools.

Pateman, Saka, and Lai's article is parallel to a multi-year study, as it is the third such report on risk behaviors juxtaposed with health education in Hawai'i's schools. Long after researchers and other interested parties have forgotten where they placed reports showing the results from the 1995, 1997, or 1999 Youth Risk Behavior Surveys, they need only go to their precious set of PERJs to find them.

Valued and unique as these offerings are, they did present editorial challenges to us as editors committed to following American Psychological Association (APA) publication style. For those who appreciate the arcane, we will share some of our editorial dilemmas and compromises that we have made in this volume and others.

In the first article appeared many old sources written long before the present emphasis on proper spelling of Hawaiian words that includes use of

diacritical marks. It was fairly straightforward to insist on original spelling in quotations and titles of documents, but what should be done with place names that are used in the names of institutions? We finally settled on referring to the newsletter as the *College of Hawaii Newsletter*, but we used the 'okina (glottal stop) when referring to the College itself, the College of Hawai'i.

This editing dilemma represents the complexity involved in our efforts to accommodate the new and the old. As editors of the *Pacific Educational Research Journal*, we have been "scolded" for writing *Hawai'i's* because the written Hawaiian language using Hawaiian words does not use apostrophes.

Similarly, some insist that "they presented *leis* to all the guests" should be "they presented *lei* to all the guests" because the Hawaiian language does not use an "s" to pluralize nouns. What these critics seem to fail to notice is that *Hawai'i* is actually just the proper spelling of a place, which is being referred to in an English sentence. Also, whereas *lei* without the "s" on the end is better Hawaiian, if one wanted to pluralize *lei*, then there would need to be a plural marker such as *nā*. What we have concluded is that it is not possible to be completely faithful to two languages when they are mixed.

Another "cultural" clash occurred when we realized that the APA publication style that we follow did not fit well with the first article, which uses extensive endnotes following a format more familiar to historical researchers. To have forced that article into the strict APA style would have been a waste of time and perhaps detrimental to the quality of the article, so we did not. Such are the challenges that bring stress to the lives of compulsive editors and require us to compromise and live with inconsistency. We are comforted somewhat by the words of Ralph Waldo Emerson in his 1841 essay, *Self-Reliance*: "A foolish consistency is the hobgoblin of little minds."

Me ke aloha pumehana (with warm aloha),

Kathleen F. Berg
Morris K. Lai
Editors

Glimpses of Campus Life at the College of Hawai'i, 1907–1920

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In the spring of 1907, the Hawai'i legislature enacted a law that established the College of Agriculture and Mechanic Arts of the Territory of Hawai'i. This essay takes the reader to the early years of this institution, providing glimpses of campus life at the college and illuminating the ways in which school leaders, faculty members, and students sought to meet the challenges of the struggling institution. By 1920, as the College took its final steps in its transition to a university, student enrollment had increased substantially, and the territorial legislature had begun providing needed financial support.

In June 1912, beneath the *kiawe* trees outside a newly constructed college hall (now Hawai'i Hall), amidst the farm patches and livestock pens, Yong Fook Tong received his Bachelor of Science in Engineering, Louise Gulick and William Hartung their Bachelors of Science, and Leslie Clark his Bachelor of Science in Agriculture. They were the first of thousands to graduate from what was to become the University of Hawai'i, then called the College of Hawai'i and originally The College of Agriculture and Mechanic Arts of the Territory of Hawai'i.¹ This essay provides glimpses of campus life at the College, illuminating the multiple ways in which college leaders, faculty members, and students sought to meet the challenges the new school faced as it struggled in fits and starts during its first decade of life. The small school size, a multiethnic student body, and the islands' history all contributed to a dynamism that gave a distinctive ambiance to campus life.

The College of Hawai'i was unique in its location in a relatively isolated tropical island chain and in its multiethnic student body. Only recently, in 1898, had Hawai'i been annexed as a territory of the United States. In the ensuing years the islands experienced profound economic and social changes. The dramatically expanding sugarcane industry, dominant since the late nineteenth century, recruited thousands of laborers from all over the world and in particular Asia. The College emerged as Hawai'i continued to experience tremendous immigration and population increase. Of the small proportion of the children of immigrants who graduated from high school in the first two decades of the twentieth century, some attended the College, foreshadowing the later increase in ethnic diversity the University of Hawai'i would experience as growing numbers of families could afford to send their children to higher education. In the 1910s, however, relatively few children of immigrants were part of the small student body.

Leslie Clark, who was in the first graduating class of 1912, later recalled, "It was no mean undertaking to 'put a college on its feet' in a community where the reasons for 'going away from home' for college were so many. We who availed ourselves of the opportunity close at home learned to appreciate this fully."² Records show that earlier attempts had been made in the legislature to establish a college, most spearheaded by Wallace R. Farrington, managing editor of the *Evening Bulletin* and later to be appointed governor of the territory. But it was not until federal dollars became available through the second Morrill Act that Hawai'i's legislators became more amenable to establishing a college.³ Even with federal funding, however, it took the influence of the Territorial Senator William J. Coelho of the island of Maui, an early advocate, to shepherd the bill through the legislative process. "Leaders of the day had no time for a bill calling for the establishment of a college of agriculture and mechanic arts in Hawai'i," Farrington recalled years later. "If Wild Bill wanted it, all right. Let it go through. Wild Bill had a vision of Hawaiian boys going to college in their own Hawai'i nei. Some wise men, busy with other things, laughed at him and let him have his way."⁴ On 25

March 1907, Governor George R. Carter signed the bill into law, and the College of Hawai'i was on its way.

According to the original Morrill Act of 1862, the purpose of land-grant colleges, as colleges of agriculture and mechanic arts were called, was, "without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." As the foregoing indicates, the idea behind the Morrill Act was to provide the country with graduates having a vocational education, which would enhance the economic development of the country. At the same time, it would make higher education more accessible to formerly excluded youths. The first Morrill Act granted public lands, while the second Morrill Act of 1890 and the Nelson Amendment of 1907 made annual incremental appropriations.⁵ In 1908–1909, during its first full year of operation, the College of Hawai'i received \$35,000 from the federal government, the maximum amount available to each state and territory, while \$12,500 came from territorial funds.⁶

The establishment of the College of Hawai'i, the youngest of the then existing sixty-eight land-grant colleges in the country, made higher education more available to greater numbers of Hawai'i's young adults, especially those who could not afford a mainland college education. This development countered earlier ideas of "an educated Island minority constituting an aristocracy of learning and leadership." But despite the opportunity, attracting and keeping academically qualified students at the College proved difficult. Of the first five students who enrolled in September 1908, when the College began officially, only Yong Fook Tong and Leslie Clark continued to graduation in 1912.⁷

To jump-start the college, acting dean Willis Pope persuaded five young men to attend preparatory classes in February 1908 to prepare them for college entrance examinations. The five—one of whom was classified as Chinese, another as Hawaiian, another as Part-Hawaiian, and two others as "Americans"—had expected to become grammar school teachers. They had attended the Territorial Normal and Training School, which offered a four-year program roughly equivalent to a high school education, and where Pope had been vice principal. Passing the entrance exams would have enabled the five to begin the first semester of regular college work the following September.⁸ When none of them passed the exams, they were allowed another year of preliminary studies, and two qualified as freshmen in September 1909.⁹

On September 14, 1908 the College opened in temporary quarters in the former Maertens family home, located near Victoria Street between Beretania and Young Streets. Funding had allowed the College to open the preceding February, but inadequate facilities and a lack of students prevented it.¹⁰

While high school graduates from financially well-off families preferred more prestigious mainland schools, few young adults from working-class families could afford schooling beyond the twelfth grade, and few were adequately prepared academically for college work. In fact, in June 1908, there were only two small public high schools in the territory—Honolulu High School, which opened in 1896, and Hilo High School, which opened in 1905.¹¹

If the meager coverage in the two daily papers was any indication, the opening of the College held little interest for residents of the territory. The press paid much more attention to the dedication of the new campus of nearby Honolulu High School on King Street.¹² At the small gathering that included the College's twelve faculty and five students, President John W. Gilmore told his audience, "Although our numbers and equipment in buildings and apparatus for teaching may seem small, yet many large and important institutions in our midst have grown from small beginnings. Commencing as we are in a new and heretofore unoccupied field, we have an advantage in that we have no precedents and our outlook is to the future."¹³

Among the first faculty were John S. Donaghho, a graduate of Marietta College and a former mathematics teacher at Honolulu High School; Minnie Reed, a graduate of Kansas State and a former science teacher at Kamehameha Schools; Frederick G. Krauss, a graduate of Stanford and a former agriculturist at Kamehameha Schools and the Hawaiian Experiment Station; William MacNeil, a graduate of Cornell and a former instructor at Punahou School; and Willis Pope, a graduate of Kansas State and a former agriculture and science teacher at the Normal School.¹⁴ With the new faculty was the first president of the College, John W. Gilmore, a graduate of Cornell and former professor of agriculture at the State Agricultural College of Pennsylvania.¹⁵

To be admitted, prospective students needed a high school diploma. Otherwise they had to pass a three-day examination that tested them in English, general history, civil government, German or French, U.S. history, English history, algebra, physics, botany, geometry, chemistry, zoology, trigonometry, geology, astronomy, and Latin or Greek. A passing score was 60 percent in each subject.¹⁶

Students had a choice of major—agriculture, science, household economics, mechanical engineering, civil engineering, or electrical engineering. All freshmen, regardless of major, took two semesters of mathematics, English, German or French, chemistry, and botany, and one semester of drawing.¹⁷

At the beginning the faculty offered free after-hours tutoring to help students grasp material they should have mastered previously. At the same time, the faculty had to increase their expertise in Hawai'i's agriculture and create relevant classroom material. The need to observe and experiment as

they taught meant that learning often became a joint affair. In this context, students sometimes developed valuable expertise that the College needed. For example, after graduation Leslie Clark, Alice Ball, George Barnhart, and Louise Clark stayed on as instructors because of their understanding of Hawai'i's agriculture and "tropical specialties."¹⁸

Enrollment of regular students remained low during the first eight years of the College. In the 1915–16 school year, the College was among only eleven of the sixty-eight land-grant colleges in the country having fewer than 300 students. The low enrollment reflected the low numbers of public high school graduates, who were the likeliest candidates for higher education at the College. In 1909 twenty-six students graduated from public high school, increasing to only forty-one by 1914 (see Table 1). Moreover, a number of students transferred to the mainland after a year or two at the College. President Gilmore reported that in the 1911–12 school year, nine students transferred, and while he wished that more would stay through graduation, he noted that the high acceptance rate to mainland colleges indicated high standards at the College.¹⁹

TABLE 1
Graduates of Hawai'i Public High Schools, 1909–1914

	1909	1910	1911	1912	1913	1914
Honolulu Graduates	19	27	36	29	26	36
Hilo Graduates	7	4	2	6	6	5
Totals	26	31	38	35	32	41

Among private schools in the 1913–14 school year, Punahou enrolled 44 seniors, 45 juniors, 44 sophomores, and 83 freshmen, and Mills School (now Mid-Pacific Institute) and St. Louis College (a secondary school) enrolled selected students for high school studies. Source: College of Hawai'i, *Report of the Board of Regents to the Legislature of 1915* 5.

The low enrollment mirrored the experience of O'ahu College, a short-lived institution of higher learning attempted fifty years earlier, and posed a dilemma for College of Hawai'i advocates.²⁰ While the legitimacy of the College depended on standards comparable to other colleges on the mainland, the small student body would fail to justify its existence for long. Moreover, Gilmore and most of his faculty had either graduated or taught in other land-grant colleges, and they believed in the land-grant idea of educational opportunity.²¹

In response to the low enrollment and the idea of widening educational opportunity, College leaders decided to offer courses to those who did not qualify as regular students. In addition to the five enrolled in the regular degree-granting program during the first year, sixty-one students attended

“Ten Weeks Courses” and thirty-one students enrolled in “Special Courses.” Table 2 shows the numbers enrolled in the varied offerings meant to increase enrollment and to promote service to the community, the latter being a goal that Gilmore considered as important as the goal of offering an industrial education and a liberal education. While extension offerings and lectures on special topics continued after the College became a university in 1920, nondegree offerings would be de-emphasized as enrollment of regular students increased.²²

TABLE 2
College of Hawai‘i Enrollment by Category of Students, 1908–1919

	1908– 09	1909– 10	1910– 11	1911– 12	1912– 13	1913– 14	1914– 15	1915– 16	1916– 17	1917– 18	1918– 19
Preparatory	5										
Regular program	5	13	19	27	24	24	21	33	42	58	83
Seniors								2	3	4	5
Juniors								4	10	15	6
Sophomores								8	13	13	16
Freshmen								19	16	26	56
Bachelor’s degree					4	5	3	2	2	3	9
Graduate students			1	1		4	3	6	2	2	5
Master’s degree						1	1				
Special studies	31	51	125	131	104	29	41	66	66	79	46
Ten weeks course	61										
Corresp. students					18	20					
Extension students					64	79					

Source: College of Hawai‘i, *Report of the Board of Regents to the Legislature, 1909–1919 passim*.

Of those taking special and extension courses, some—like Louise Gulick and Maruichi Kuwamoto—eventually enrolled as regular students, but most seemed uninterested in obtaining a degree. Mathematics professor John S. Donaghho later recalled that most of the special students were women who wanted to study French, English, or art. “None of the ladies wanted to study mathematics,” he recalled. “And so I had only three classes, of five students each. . . . It wasn’t enough to keep me busy; and most of the other professors were just as idle.” Among those enrolled as special students in the first year of the College were the wives and daughters of the islands’ more notable families—the Monsarrats, MacFarlanes, Iaukeas, McCandleesses, Wilders, Damons, and Campbells.²³

The academic seriousness of the special students varied. In a French class offered in 1912, the students were “insufficiently prepared,” a College report stated, and “under the stress of social or household duties they [did] not hesitate at times to neglect their college work entirely.” On the other hand, a

short story course offered in the fall of 1911 drew twenty-three students who “evinced such intelligent interest that, by request, the class continued until June, though it had been announced for only one term. All these students were specials, and of course unequally prepared, but the quality of the work turned out by some was gratifyingly excellent.”²⁴

Enrollment by regular students began increasing after World War I as more and more immigrant families could afford to send their American-born children to high school and then to college, instead of having them work to augment the family income. At the same time, both the Normal School and the public high schools began instituting studies that helped prepare students for the entrance requirements of the College.²⁵

The free tuition at the College helped tremendously, giving many students the opportunity they would not have had otherwise. Table 3 compares the expense in 1916 of the College of Hawai'i with mainland colleges commonly selected by the islands' high school graduates.

Besides enrollment, a major concern of College leaders was the inadequacy of the temporary site at the Maertens house. The living room, which functioned as the school's library, quickly ran out of space in the beginning of the second school year with five thousand volumes and seven thousand pamphlets of government documents overflowing from its shelves. Furthermore, lamented President Gilmore, “The College has advertised courses in engineering that require machinery equipment. Yet we have no

TABLE 3
Cost (in Dollars) of Attending Colleges, 1916

	Tuition	Fees	Travel	Total
Hawai'i	0	5	0	5
Stanford	50	9	180	239
U of California*	20	52	180	252
Mills (California)	150	10	180	340
U of Wisconsin*	100	32	250	382
Cornell	100	10	340	450
Yale	160	20	340	520
Wellesley	175	25	340	540
Princeton	175	44	340	559
Harvard	200	20	340	560
Bryn Mawr	200	25	340	565
MIT	250	0	340	590

*Land-grant university. Source: *Ka Palapala*, 1916 37.

place to put the equipment. Our chemical laboratory is too small and we have no physics laboratory at all."²⁶

Fortunately there was a permanent site on ninety acres in Mānoa Valley, just a few miles away. "About forty acres of this [land] will be included in the campus and the remainder will be devoted to pastures and agricultural purposes," Gilmore noted enthusiastically. "A mountain stream borders one side of the property. This furnishes water for irrigation, power and other purposes. Permanent plantings will be made of all Hawaiian plants as far [as] conditions will permit. With all the facilities that this site affords, the College of Hawaii should be able to develop the opportunities in education for the industries that lie before it."²⁷

The site had been selected by the Board of Regents in 1907, but not until 1911 were the Regents able to acquire all the acreage the College needed. The clearing of wild lantana, *kiawe* (algaroba), *pānini* (prickly pear), and over five thousand cubic yards of rock from the property began in 1909. Much of the rock had been used for walls that tenants and squatters had constructed to divide their garden plots. Once collected, the rocks covered nearly an acre five feet high and were eventually sold at ten cents a wagonload, lichen-covered rocks garnering twenty-five cents.²⁸

In 1911 the legislature finally succumbed to pleas for permanent and more suitable quarters by appropriating \$75,000 for a building. When the building was almost completed at the end of May 1912, students and faculty trekked to the site for tree planting followed by a picnic.²⁹

The following fall there was much rejoicing when the College moved into "the quiet, airy, commodious, and dignified college hall set amid the beauties of Honolulu's most charming valley." The English professor Arthur L. Andrews probably described the sentiments of many when he stated, "We are like the ragged who put on garments clean and whole, or the dweller in a squalid tenement, who, not having lost his self respect, finds himself moved to a respectable home of his own."³⁰

Recalling that first fall at the new campus in Mānoa valley, student Shirley Foster wrote, "It was in September of 1912 that we wiped the mud from our shoes on a patch of grass which refused to accommodate more than one foot at a time, ascended the gleaming white stairs and entered the pine-scented halls of the new College of Hawaii. . . . Those were the days when we plodded through acres of uninspiring mud down Maile Way, for Leslie Clark had not yet conceived his famous cinderpath; those were the days when we followed the trail through the *kolu* [a tropical shrub having fragrant flowers] and cactus to the Chemistry Lab., and when the 'farm' consisted of a few gentle-eyed kine who chewed their cuds contentedly . . . and those were the days when we 'lived' and crammed and held social gatherings in the Library to Mrs. Bryan's continuous and explosive 'Sssssh's.'"³¹

William Meinecke, who graduated in 1913, recalled, "The problem of removing mud that collected on one's shoes in excess quantities along Maile

Way was solved practically by having sticks available at intervals that coincided with the ultimate mud that could be collected by one pair of shoes. These sticks were used to scrape off the mud, then stuck upright in the ground for the use of the next pilgrim." Richard Man Sing Goo, who graduated in 1916, noted, "In Manoa, one is often either nearly drowned by rain or stuck in the mud, or both." To encourage funding, Arthur Keller, professor of civil engineering, proposed in 1914 an experimental road that would test various surfaces under natural conditions. His suggestion was adopted the following year with sections laid between Metcalf Street and Maile Way, one of concrete, another of warrenite, another of coral, and another of asphalt, the last of which proved the best of the lot when sealed with a coat of oil.³²

The college hall, which was formally named Hawaii Hall in 1922, was the center of campus activities. The library and the cafeteria served as meeting and study areas, and early on lack of space became a major concern. In 1913 the nearly eighty students and staff were more than the library could hold at a single sitting. The office of professor Donaghho housed the icebox that supplied the cold water for the water cooler, strategically placed in the hallway.³³ Although such close quarters could at times pose problems, they allowed for greater face-to-face contact and intimacy among students and faculty, something that would diminish considerably in the next twenty years.

In this small-school environment, campus-wide social events further strengthened congeniality and friendships. Each semester began with a reception tea, and the year concluded with a commencement banquet sponsored by the college president or one of the faculty, with the wives of the male faculty often serving as hostesses. Faculty chaperoned beach parties at Kāhala and Diamond Head, and sometimes hosted dances at their homes. Students and faculty held annual Halloween parties in the college hall, with "mysterious creatures," "weird lanterns," and "wicked little pumpkins" setting the atmosphere. Students organized surfing and canoeing events in Waikīkī, hikes to Mount Olympus at the top of Saint Louis Heights and to Mount Tantalus, and annual treks in a caravan of cars to Waialua and Pūpūkea.³⁴

Campus clubs sprouted here and there, and sporting events enlivened campus life. There were intramural games between classes and between students of different majors. At the annual track meet in 1913 held at Alexander Field the Farmers nosed out the Engineers by 47 to 46, but the Engineers exacted a measure of revenge later that year by winning at baseball. In 1914 the male freshmen overcame the male upperclassmen in a game of indoor baseball. In 1917 fifteen of the twenty-two male upperclassmen participated in a three-month-long tennis tournament with faculty Arthur Dean, Louis Henke and Arthur Andrews also swinging the catgut. The twelve participants of the women's tournament included seven

special students and faculty Maria Heuer, Florence Lee, and Mildred Cowdrey.³⁵

Efforts to field athletic teams began when the College opened in 1908, but "there were not enough athletically-inclined men to compose a basketball quintet, much less a baseball nine, and least a football eleven," wrote student newspaper reporter Harry Shiramizu two decades later. "But, in the autumn of 1909," he continued, "seventeen inexperienced but ambitious athletes, including three members of the faculty, banded together," joining the high school Interscholastic Football League, with Leslie Clark as team captain. The team practiced on the front lawn of the Maertens house. Professor Keller later recalled, "Our positions? We played everything. . . . Our coach? Why we had no coach."³⁶

The College played for three seasons, but lack of a practice field posed a problem, and the team disbanded after being excluded from the league.³⁷ Once an athletic field was constructed in 1915, however, the team returned to the league, winning a string of victories that season.³⁸

Yet the struggle to maintain a viable team continued. In 1917 *Ka Palapala* editor and resident curmudgeon A. Hebard Case admonished his fellow students, "Athletics at the college this past year were a partial failure, and they will continue to be a failure until some kind of college spirit is shown by a good many of YOU students. During the football campaign, candidates for our team were counted easily, on one's fingers. On an average about eight men turned out for practice, eight men out of a possible forty. . . . I think that someone ought to suggest giving a sewing-bee or perhaps a pink tea for the poor delicate souls who are so overburdened and weighted down by constant worry and work that they cannot possibly spare their precious time in good healthy exercise." Perhaps the haranguing by Case inspired the student body, or having a practice field allowed a higher level of play, or maybe it was the maturing of the College on the eve of becoming a university. Whatever the reason, the first decade of the College ended with glory for the young institution when it captured the 1919 territorial championship.³⁹

To support the nascent athletic program, students had formed the Associated Students of the College of Hawai'i (ASCH) in October 1910. But participation was low. In the 1917 yearbook, Case, who was graduating that year, chided his fellow students.

"Every first Monday in each month, during the past school year, was set aside as the date of the regular ASCH meetings," he wrote. "A good many times the meetings were not held because of so few members being present. . . . [W]here were you when the time came to get together? On days when a meeting was called, you could easily find fifteen to twenty boys downstairs talking and having a good time, instead of being upstairs at the meeting. . . . [D]on't you think . . . that it is time you woke up and took an interest in school affairs?"⁴⁰

Other student activities also began in fits and starts. The first yearbook, *The Hawaii Collegian*, appeared in 1910, but nothing followed it until *Ka Palapala* began annual publications in 1916. The student newspaper *Ka Leo O Hawaii* did not emerge until 1922. Meanwhile, the campus prankster Edward Tracy, who graduated in 1913, occasionally posted on a bulletin board the *Engineering Idler*, a typewritten sheet of notices, gossip, and humor. Banned by President Gilmore for "obscene" humor, the "newspaper" was later remembered fondly by Professor Donaghho, who noted that the *Idler* was "usually well written, and the mishaps, and occasionally the foibles, of faculty and fellow students were held up for good-natured laughter."⁴¹

Because of the ethnic mix in the islands during the first two decades of the twentieth century, it is not surprising that the College was more ethnically diverse than mainland colleges and universities. Nevertheless, European Americans were highly overrepresented as regular students in degree-granting programs and as alumni. While only 7.7 percent of Hawai'i's population was *haole* in 1920, they made up 40.9 percent of the regular students in the 1916–17 school year, and 46.5 percent of all graduates. Chinese Americans, and to a lesser degree Korean Americans, were also overrepresented at the College. In contrast, Filipino Americans, Native Hawaiians, Japanese Americans, and Portuguese Americans were underrepresented (see Table 4).

Despite the overrepresentation of Caucasians, non-Caucasians constituted over half of the student body. One result of their enrollment was the presence on campus of a substantial proportion of non-native speakers of Standard English. The working-class children of immigrant plantation workers spoke their parents' native language, and also Hawai'i Creole English (HCE), a language that derived from the Hawai'i Pidgin English that was spoken by immigrant plantation workers. HCE was the first language of many of the children of these plantation workers. "Although a mastery of idiomatic English presents great difficulties to such students," noted College leaders, "it is one of the most important functions of the college to assist them to it."⁴² In later years, as an increasing number of children of plantation workers enrolled, the University would attack the challenge more vigorously.

While Asian Americans and Native Hawaiians enrolled as regular students, they tended to eschew campus organizations and activities. A perusal of photographs and photo collages in the yearbook *Ka Palapala* shows a dominance of *haole* students. Perhaps the inability to speak Standard English fluently influenced their nonparticipation. Moreover, Hawai'i's political and social climate during this period precluded extensive social interaction among ethnic groups, and in particular, between *haole* and non-*haole*.⁴³ This was not unusual in the national context, where segregation was the norm.

As in the larger community, where Caucasians constituted the economic, social, and political elite, Caucasian students dominated in campus-wide

TABLE 4

Regular Students at the College of Hawai'i, in Numbers and Percentages, by Ethnic Group and Sex

Ethnic Group	Territory, 1920		Regular students, 1916-17		Graduates, 1912-20	
	#	%	#	%	#	%
Caucasians	19,708	7.7	18	40.9	21	48.8
males	12,309		14		16	
females	7,399		4		5	
Chinese	23,507	9.2	13	29.5	12	27.9
males	16,197		12		11	
females	7,310		1		1	
Filipinos	21,031	8.2	0	0.0	0	0.0
males	16,851		0		0	
females	4,180		0		0	
Hawaiians	41,750	16.3	3	6.8	3	7.0
males	21,042		3		3	
females	20,708		0		0	
Japanese	109,274	42.7	6	13.6	5	11.6
males	62,644		6		5	
females	46,630		0		0	
Koreans	4,950	1.9	3	6.8	1	2.3
males	3,498		3		1	
females	1,452		0		0	
Portuguese	27,002	10.6	0	0.0	0	0.0
males	13,737		0		0	
females	13,265		0		0	
Others	8,690	3.4	1	2.3	1	2.3
males	4,868		1		0	
females	3,822		0		1	
Total Non-Caucasians	236,204	92.3	26	59.1	22	51.2
Total Males	151,146	59.1	39	88.6	36	83.7
Total Females	104,766	40.9	5	11.4	7	16.3
Total of All Groups	255,912	100.0	44	100.0	43	100.0

Note. The Portuguese, like the Asians, were recruited to work on the sugar plantations. "Hawaiians" includes Part-Hawaiians. "Others" includes Blacks, Puerto Ricans, Spaniards, and Others. Sources: Territorial population figures are from *Fourteenth Census, Population 1920* 1190; figures for regular students are from College of Hawai'i, *Biennial Catalogue 1916-1918* 75-76; figures for graduating classes are from *Ka Palapala*, 1917 60-62, and 1918-25 passim.

leadership positions. The lack of social mixing and resulting unfamiliarity with Asian Americans were reflected in student and administrative publications. Because all twenty editors of the 1916 to 1920 issues of *Ka Palapala* were European American, errors in student names occurred frequently. For example, Maruichi Kuwamoto was listed as "Maruichi" in the caption for the 1917 *Ka Palapala* photo of the football team when all other players were listed with their family names. College documents listed Seiji Yogi as Seigei and Seigi.⁴⁴ Such misspellings occurred also in the daily *Star Bulletin*, in which Maruichi's name was spelled Mariuchi in the three news stories that appeared after his death following a football game.

Greater ethnic diversity existed on athletic teams. The star of nearly every team of the College was of Hawaiian descent: William "Bill" Rice on the 1911 football and track teams, and Lionel "Dusky" Brash when the College resumed football in 1915.⁴⁵ Players of Japanese or Chinese descent also participated in athletics.

Among females, few were non-*haole*. In fact, women as a group were underrepresented as students in regular degree-granting programs. While they made up 40.9 percent of the territory's population, they were 11.4 percent of the regular students in 1916–17 and 16.3 percent of the alumni (see Table 4). In the life of the College, women never constituted more than a fourth of the student body, and that occurred only in 1911–12 (21 men, 7 women) and in 1917–18 (45 men, 15 women). In fact there were years when men greatly outnumbered women as regular students, such as in 1915–16 (35–4), 1916–17 (39–5), and 1919–20 (91–15). Nevertheless, the women who did enroll organized into clubs and joined in athletic endeavors, in particular, tennis, although there were no interscholastic sports for women. Among the faculty, women at the professorial rank taught art, domestic science, and foreign languages.⁴⁶

In 1917 the dark clouds of global war interrupted College life. Anxious about questions of loyalty, the Board of Regents directed Arthur L. Dean, who had assumed the presidency in 1914, to ask the faculty, "Do you support in thought, in word and in so far as lies in your power, in deed, the purposes of the United States as stated by President Wilson in his message to Congress of December 4, 1917?" Of the 21 replies to his inquiry, 19 responded in the affirmative, and 2 dissented. Elizabeth Matthews, an American citizen and assistant professor of Household Service, opposed America's entrance into the war although she professed loyalty to the United States. When Matthews refused to resign, the Regents decided not to renew her contract in spring 1918. The other dissenter, Maria Heuer, a German citizen and assistant professor of German and French, could not support the war effort nor swear allegiance to the United States. Heuer's response prompted the Regents to regard her as a potential enemy of the country and detrimental to the welfare of the students. President Dean disagreed, arguing that Heuer should not be persecuted for her ideas. He convinced regents Charles R. Hemenway and

Jennie R. Ashford, but Chairman Wallace R. Farrington continued to lobby for her dismissal. When a unanimous vote became impossible, Frederick L. Waldron resigned from the Board. The matter was resolved when Heuer tendered her resignation, which the Board accepted, paying her \$900 in salary for the remainder of the year. It would be 1927 before the College would again offer a German language course.⁴⁷

As war jobs engaged many residents of the territory, enrollment of special students dipped precipitously. Regular students joined the Students Army Training Corps (SATC), which normally required a hundred men to form a unit. However, because the College enrolled fewer than a hundred students in the fall of 1918, the U.S. War Department permitted the College to form a fifty-man unit. The unit would be provided with uniforms, equipment, and instruction, while the College would be responsible for housing, for which it would receive a dollar per day per student.⁴⁸

There being no dormitory for the College, Acting President John Young requested \$6000 from the contingency fund of Governor Charles McCarthy, who responded positively. Meanwhile the SATC was housed in tents pitched on the campus lawn. When a severe storm hit the islands, winds razed the tents and sent the men into the hallways of the main building. Unfortunately for the quest of a dormitory, the war ended and the SATC units were demobilized. At that point McCarthy pulled the money back and the dormitory went unbuilt.⁴⁹

Near the end of the decade, the College had established itself with prospective college students in Hawai'i and a few students from the mainland and Asia. Table 5 shows the breakdown of students for the 1918–19 school year.

TABLE 5
College of Hawai'i Students and Their Geographical Distribution, 1918–19

Degree candidates		Nondegree candidates	
Graduate	1	Student Army Training Corps	18
Seniors	5	Graduates in Undergraduate Courses	4
Juniors	6	Specials	46
Sophomores	16	Short Course in Sugar Laboratory	12
Freshmen	40	Repeated names	3
Total	68	Total	77
Geographical distribution			
O'ahu	118	Japan	2
Hawai'i	12	China	1
Kaua'i	4	California	1
Maui	6	Michigan	1

Source: College of Hawai'i, *Catalogue 1919–1920* 78–79.

By this time the College had gained greater support from business and political leaders, largely due to the decision by President Dean and the Board of Regents to emphasize sugar technology as a program of study. Previously the College had felt obligated as a land-grant institution to favor diversified agriculture. But the Morrill Act's vague wording convinced the Regents in 1914 to shift the emphasis to sugar technology.⁵⁰

The new direction encouraged the 1915 territorial legislature to double the College budget for salaries and improvements and allocate \$75,000 for a new science building. The 1917 legislature appropriated an additional fifty percent to the College, in addition to money for another building.⁵¹

Thus, as the decade drew to a close, the perpetual struggle for enrollment and funding finally eased. Enrollment grew significantly (see Figure 1) as high school graduation numbers increased and the legislature began appropriating increasing funds. In contrast to an appropriation of \$279,000 during its first ten years of existence, the College received \$281,500 from the Legislature for the 1919–21 biennium alone.⁵²

This was an auspicious sign as the College in July 1920 took its final steps in its transition to a university, ending the first chapter of campus life at Mānoa. For many of the graduates of the College, however, it was just the beginning of productive lives that lay ahead of them. By 1930, 67 percent of the 42 alumni continued to live in Hawai'i, with 43 percent of the graduates

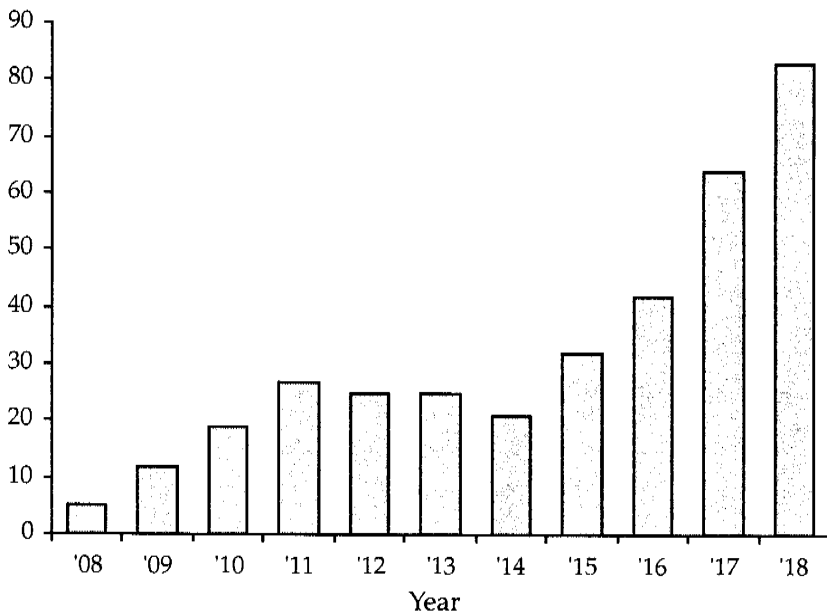


FIGURE 1. Enrollment numbers of regular students at the College of Hawai'i, 1908–1918.

Awaya and Tamura

in jobs as chemists, agriculturalists, or engineers in the territory's sugar and pineapple industries, and 48 percent in non-agricultural occupations.⁵³ As alumni Leslie Clark noted with hope, "Our trained men are holding numerous positions in the Territory and today the students may be counted in tens where they were previously counted by ones. May our College keep on growing, reaching outward and upward for the attainment of the high aims that the fathers set for her. May her graduates continue to fill more and more the responsible positions of the community."⁵⁴

TABLE 6
Key Dates

1907	March 25	Governor George Carter signs bill establishing the College of Hawai'i
1908	September 14	College of Hawai'i opens in temporary quarters
1912	September	College moves to permanent site in Mānoa
1920	July	College of Hawai'i becomes University of Hawai'i

The Play

When the fall semester began in 1912 at the new Mānoa campus, students began lobbying for a tennis court. When they realized that more pressing needs like roads, walkways, plants, and equipment would take precedence, however, they decided to stage a play as a fundraising effort. They cast Bernice Smith, Shirley Foster, Lillian Boyd, Scott Pratt, Leslie Clark, Ted Tracy, Clayton Cousens, and Dorothy Nobb in "The Revolving Wedge," with the English professor Arthur Andrews and his wife serving as "coaches."⁵⁵ Andrews lauded the effort in "training in the art of oral interpretation," in "intensifying college spirit and in arousing public interest," but lamented the lack of an auditorium. With only one building on campus, the cast was forced to rehearse and perform in off-campus facilities.⁵⁶

The play opened at Punahou School's Bishop Hall on the night before Thanksgiving, followed by another performance the next evening. The admission fee was twenty-five cents. With shows well-received before packed houses, the cast gave another performance at the Opera House in late December.

Encouraged by audience enthusiasm, Irene Aiken, who was enrolled as a special student, urged the group to take the show to her home island of Maui. With Shirley Foster's brother Charles Foster substituting for Leslie Clark, the group boarded the *Claudine* on December 27, enduring a rough trip that caused many to become seasick.

When the group arrived at the Pā'ia, Maui theater owned by E. K. Fernandez, they learned that neither he nor anyone else knew that there would be a performance that evening. Once the panic had subsided, the cast persuaded a Pā'ia telephone operator to spread the word. Luckily most phones at the time were connected with party lines. Devoid of props and sets except for ferns the cast had collected, the nearly bare stage was lighted "by an apparatus run by a gasoline engine which went chug, chug throughout the performance."⁵⁷

A New Year's trip to the summit of Haleakalā mountain was sandwiched between performances in the towns of Kahului, Wailuku, and Lahaina. The Kahului theater was filled, but when the largely Japanese immigrant audience learned that they were not to see a movie but a play by college students, many decided to leave, and the clattering of *geta*—wooden clogs—drowned out the voices of the performers. In Lahaina, the cast played to an empty house when the normally dry area received a downpour that kept the townspeople home.

Receipts from the play and another one the following year—"The Mysterious Dr. Burdon" by Bernice Smith and Shirley Foster—not only paid for the construction of a tennis court, but it also helped to meet the debts of the Associated Students of the College of Hawai'i.⁵⁸ In this episode, student concerns led to effective student action.

Alice Augusta Ball⁵⁹

"Hawaiian Girl Heroine First Made Possible Chaulmoogra Leprosy Cure," announced an article in the 1925 *Honolulu Advertiser*. The article explained that Alice Ball had been honored posthumously at the Far Eastern Tropical Medical conference in Japan for her work in developing an effective treatment for leprosy.⁶⁰ Who was this "Hawaiian girl"?

Alice A. Ball, African American, was born in Seattle in 1892. Her parents were photographers, and her father was also a lawyer. Her grandfather was a well-known "freeman" photographer and active abolitionist.⁶¹ Ball grew up in Seattle, except for a few years when she and her family lived in Honolulu, where she attended Central Grammar School. She continued her schooling at Seattle High School, and then matriculated at the University of Washington, where she majored in pharmacy.⁶²

Upon graduation, Ball returned to Honolulu where she attended the College of Hawai'i. In June 1915, she received her Master's degree, becoming the first and only woman to do so during life of the College. In fact, she and Alfred Warren, who preceded her by a year, were the only two people to earn Master's degrees at the College. So impressed with her were her professors that in the fall of 1915, she became the first woman chemistry instructor. Unfortunately, within a year, ill-health forced her to return to her family in

Seattle. On December 31, 1916, at the age of twenty-four, she died of an asthma-like illness.⁶³

While attempting to extract the active ingredients of the *‘awa* root (*piper methysticum*), the focus of her Master’s thesis, Ball was asked by Dr. Harry H. Hollman, the U.S. public health officer in Hawai‘i, to attempt a similar process with chaulmoogra oil, which for centuries had been used in Asia to treat leprosy. Ball successfully extracted the active ingredients of the oil. Her breakthrough—Ball’s Method—enabled doctors to administer the oil hypodermically, with less painful effects. After her death Arthur L. Dean and others further developed the extract to improve its effectiveness, and in the 1940s the sulfones were discovered as a more effective remedy.⁶⁴ Although her professional life was brief, Alice A. Ball remains one of the early successes of the College of Hawai‘i.

Maruichi Kuwamoto

In 1910 Maruichi Kuwamoto enrolled as a special student at the College of Hawai‘i. He played halfback on the College football team, the first Japanese football player for the College, while earning enough credits to gain standing as a sophomore in sugar technology the following year, when he again occupied the halfback position on the gridiron.⁶⁵

Born in Japan, Kuwamoto was eight years old when he and his mother arrived in Hawai‘i to join his father, who had just ended his contract as a plantation worker. The family settled in Kona, where Kuwamoto’s father opened a blacksmith shop. After attending grammar school in Kona, Kuwamoto, one of twelve children, went to Honolulu to attend McKinley High School. He boarded at the Okumura Home, run by the Reverend Takie Okumura of the Makiki Christian Church. After two years at the College, Kuwamoto’s money ran low, so he left school to work as a chemist at the Kōloa Plantation on Kaua‘i. After two years his father called him to Honolulu, where the family then resided next to their blacksmith shop on South Beretania Street.⁶⁶

Re-enrolling at the College, Kuwamoto rejoined the football team as a left halfback. It was during the last game of the 1917 season—when Kuwamoto was twenty-eight years old—that he was fatally injured. With only two minutes in the game already won by the College, then leading 12 to 0, the Kamehameha quarterback threw a pass that Kuwamoto and Lionel Brash both attempted to intercept. The collision between the two ended with Kuwamoto lying on the field unconscious.⁶⁷

Although he remained unconscious, Kuwamoto’s breathing and pulse returned to normal, and the physician on the field declared him to be all right. The assistant coach and professor David Crawford had him carried to the Crawford home for a hot bath and bed rest, whereupon the Kuwamoto family was summoned. When Kuwamoto’s pulse and temperature rose

rapidly, Dr. A. C. Jackson suspected a concussion and had him rushed to Queen's Hospital. But it was too late, and Kuwamoto died. It was later reported that Kuwamoto had been carried off the field unconscious twice before during the season, the second time only the week before.⁶⁸

Kuwamoto's death shocked and saddened College of Hawai'i students and faculty. All agreed that he was intelligent, personable, and hardworking. The night after the funeral, attended by many in the community, the family held a private service that was reported by the *Pacific Commercial Advertiser* to be in keeping with "the exotic religion of the Far East."⁶⁹ Because Kuwamoto would have graduated at the end of the school year had his fatal accident not occurred, the faculty decided to include his name in the list recommended to the Board of Regents for a B.S. degree in sugar technology.⁷⁰

William Hildebert Meinecke

As a member of the class of 1913, the second group to graduate from the College of Hawai'i, William Meinecke posed for a yearbook photo with fellow graduates Valentine Marcallino, Lillian Boyd, Seiji Yogi, and Edward Tracy. This photo and his graduation, however, did not end his ties to the institution. On the contrary, Meinecke became one of the College's biggest boosters and most loyal alumni.⁷¹

Meinecke began his College career in 1909, when there were fewer than twenty regular students enrolled. He participated in various college activities and gained a reputation as an all-around athlete. He played on the College football team, and on the basketball and track teams.⁷²

With a B.S. in Agriculture, Meinecke became farm manager and agriculture teacher at Mills School, now called Mid-Pacific Institute. After a year there, he taught at the Wai'alaie Boys' Industrial School, and then at the Normal School. He later headed the science department at Hilo High School, and then became the supervising principal of East Maui and Moloka'i schools. When World War I broke out, he served in the National Guard, where he was promoted to First Lieutenant. After the war, he taught at the Normal School, where he remained until 1931, when the Normal School became part of the University of Hawai'i, at which point he became assistant to the University President David L. Crawford.⁷³

Meinecke's interest in sports continued after he graduated from college. At the various schools in which he taught, he coached track, baseball, volleyball, football, and girl's basketball. In 1930 he held the record for the run from Wilder Avenue to Tantalus Peak and back.⁷⁴

Twenty-five years after the founding of the College, he continued to be actively involved in the Alumni Association and was its "first paid-up life member." He was then assistant treasurer at the University.⁷⁵

Notes

¹ *Ka Palapala* (Honolulu: College of Hawai'i, 1917), 60–61. *Kiawe* is the Hawaiian name for the mesquite or algaroba tree. Yong Fook Tong was also listed as Fook Tong Yong in various College publications. The College of Agriculture and Mechanic Arts of the Territory of Hawai'i officially became The College of Hawai'i in 1911. See Victor Kobayashi, ed., *Building a Rainbow* (Honolulu: Hui O Students University of Hawai'i, 1983) 7.

² *Ka Palapala* (Honolulu: College of Hawaii, 1917) 60.

³ John W. Gilmore, "The College of Hawaii: Its Work and Outlook," *The Hawaiian Forester and Agriculturalist*, 5:1 (January 1909) 6; John W. Gilmore, "The College of Hawaii," *The Hawaiian Almanac and Annual*, 1910 148–149; Kittelson, "The History of the College of Hawaii," M.A. thesis, University of Hawai'i, 1966 14–20; *Honolulu Star-Bulletin* 31 March 1947.

⁴ *Hawaii Alumnus* (also called *University of Hawaii Alumni Magazine* and *Alumni News*) 6 (1932) 5; *Honolulu Star-Bulletin* 31 March 1947.

⁵ "Morrill Act of 1862," Chapter 130, 12 Stat. 503; U.S. Department of the Interior, *Report of the Commissioner of Education for the Year Ended June 30, 1917*, vol. 2 (Washington: GPO, 1917) 371; Paul Westmeyer, *An Analytical History of American Higher Education*, 2nd ed. (Springfield, IL: Charles C. Tomas, 1997) 61–65.

⁶ U.S. Department of the Interior, *Report of the Commissioner of Education for the Year Ended June 30, 1909*, vol. 2 (Washington: GPO, 1910) 995, 1020.

⁷ Quote is from Kittelson, "The History of the College of Hawaii" 36–37; U.S. Department of the Interior, *Report of the Commissioner of Education for the Year Ended June 30, 1909*, vol. 2 (Washington: GPO, 1910) 1006–1008; College of Hawai'i, *Annual Catalogue, 1908–1909* (Honolulu: College of Hawai'i) 62; College of Hawai'i, *Annual Catalogue, 1909–1910* 62. There was at least one land-grant college in each of the states and territories of the United States.

⁸ Willis T. Pope, *Report: College of Agriculture and Mechanic Arts, February 27, 1908* (Honolulu: College of Hawai'i, 1908) 1. Until 1922 the Normal School, a division of the public school system, accepted eighth-grade graduates for a four-year program. From 1922 the School accepted only high school graduates for a two-year program. In 1931 it merged with the University of Hawai'i to become Teachers College, which offered a four-year program for prospective elementary and secondary teachers. See Eileen H. Tamura, *Americanization, Acculturation, and Ethnic Identity: The Nisei Generation in Hawaii* (Urbana: University of Illinois Press, 1994) 263 n. 22.

⁹ *Honolulu Star-Bulletin* 31 May 1932; College of Hawai'i, *Annual Catalogue, 1909–1910* 62; Kittelson, "The History of the College of Hawaii" 32.

¹⁰ The Maertens house had been used by the Chinese Consulate before it was turned over to the College. Adjacent to the Maertens house, a new building was constructed with fifteen rooms for classrooms, laboratories, offices and storage. This building was later taken to Mānoa when the College

moved to its permanent site; there it served as a chemistry lab until Gartley Hall opened in 1922. After the College moved to Mānoa the Maertens house became part of McKinley High before the school moved into its present site on King Street. See Kobayashi, *Building a Rainbow* 4; Kittelson, "The History of the College of Hawaii" 27–31. After the house was demolished, Lincoln School was built on the site before the school moved to its present location near Roosevelt High School. See Beatrice Krauss, "Some O The Founders Reminisce," *Hawaii Alumnus* (Honolulu: University of Hawai'i Alumni Association, 1937) 13.

¹¹ Maui High opened in 1913, Kaua'i High in 1914, and Lahainaluna, founded in 1831, became part of the public school system in 1923.

¹² We were able to find just two articles on the opening of the College of Hawai'i. See *Pacific Commercial Advertiser* (PCA) 13 September 1908; PCA 16 September 1908.

¹³ PCA 16 September 1908; College of Hawai'i, *Annual Catalogue, 1908–1909* 41.

¹⁴ Willis T. Pope, *Report: College of Agriculture and Mechanic Arts, April 9, 1908* (Honolulu: College of Hawai'i, 1908) 5–7.

¹⁵ Kittelson, "The History of the College of Hawaii" 33.

¹⁶ College of Hawai'i, *Annual Catalogue, 1908–1909* 12–13.

¹⁷ College of Hawai'i, *Annual Catalogue, 1908–1909* 23–61.

¹⁸ Kittelson, "The History of the College of Hawaii" 38–41.

¹⁹ *Report of the Commissioner of Education for the Year Ended June 30, 1917*, vol. 2 (Washington: GPO, 1917) 382–84; College of Hawai'i, *Report of the Board of Regents to the Legislature of 1913* (Honolulu: College of Hawai'i, 1913) 7.

²⁰ Punahou School, originally established in 1841 to educate missionary children, was rechartered as Oahu College in 1853 and admitted four students in 1856. In 1865 college classes were discontinued because of the low number of qualified students, and the school returned to its former name and status. See Mary Charlotte Alexander and Charlotte Peabody Dodge, *Punahou, 1841–1941* (Berkeley: University of California Press, 1941) 186–401; Kittelson, "The History of the College of Hawaii" 2–3.

²¹ Kittelson, "The History of the College of Hawaii" 35.

²² Kittelson, "The History of the College of Hawaii" 35, 45, 140; College of Hawai'i, *Annual Catalogue, 1908–1909* 62–63; John W. Gilmore, "The College of Hawaii: Its Work and Outlook" 4–13. The faculty also traveled to the other islands to give lectures and demonstrations. Gilmore estimated that extension services by the faculty reached 600 people beyond the confines of the campus.

²³ HSB 28 December 1935; College of Hawai'i, *Annual Catalogue, 1908–1909* 62–63; College of Hawai'i, *Annual Catalogue, 1910–1911* 85.

²⁴ College of Hawai'i, *Report of the Board of Regents to the Legislature of 1913* (Honolulu: College of Hawai'i, 1913) 15–16.

²⁵ Kittelson, "The History of the College of Hawaii" 36.

²⁶ Gilmore, "The College of Hawaii: Its Work and Outlook" 6; Kittelson, "The History of the College of Hawaii" 41–42; College of Hawai'i, *Annual Catalogue, 1909–1910* 9.

²⁷ Gilmore, "The College of Hawaii" 155. The botanist Joseph Rock began the effort to create the campus as a botanical garden by planting 500 species of plants. See Kittelson, "The History of the College of Hawaii" 111. Today the University pays tribute to that effort with a brochure and a walking tour.

²⁸ Kittelson, "The History of the College of Hawaii" 26–29; Kobayashi, *Building a Rainbow* 7.

²⁹ *Ka Palapala*, 1916 32.

³⁰ College of Hawai'i, *Report of the Board of Regents to the Legislature of 1913* (Honolulu: College of Hawai'i) 12–13. The college hall was the sole permanent building until 1928 when a building was constructed in the Engineer Quadrangle. See Kobayashi, *Building a Rainbow* 21.

³¹ Shirley Foster, "Reminiscences of Former Days," *Ka Palapala*, 1916 32–33.

³² *Alumni News* 5 December 1950; *Ka Palapala* 1916 36; College of Hawai'i, *Report of the Board of Regents to the Legislature of 1915* (Honolulu: College of Hawai'i, 1915) 12; College of Hawai'i, *Report of the Board of Regents to the Legislature of 1919* (Honolulu: College of Hawai'i, 1919) 6.

³³ Kobayashi, *Building a Rainbow* 10; *Hawaii Alumnus* 1937 21; Krauss, "Some O The Founders Reminisce" 20.

³⁴ Foster, "Reminiscences of Former Days" 34–35; Jannatt V. Sharp, "Our Playtime," *Ka Palapala*, 1916 63–70; *Ka Palapala*, 1916 13.

³⁵ Foster, "Reminiscences of Former Days" 33–35; *Ka Palapala*, 1917 79–80; The Woman's Club, organized in 1908, was the first College club. A glee club formed in 1912 and participants of the yearly dramatic production organized a drama club in 1919. The students of each of the majors grouped themselves into informal organizations as did the staff of the *Ka Palapala*, which began publication in May 1916. See *Ka Palapala* 23.

³⁶ *Ka Leo O Hawaii* 10 November 1926; *HSB* 28 December 1935; Kobayashi, *Building a Rainbow* 6.

³⁷ Kittelson, "The History of the College of Hawaii" 90–91. The College won its very first game on October 23, 1909 by a score of 6–5 (touchdowns counted five points at the time) when the McKinley kicker missed an extra point that would have tied the game. This game was followed by losses to Punahou (0–23 and 0–11) and a second victory over McKinley, 10–0. The team played without a name throughout the College years. First mention of the name Fighting Deans came during the 1922 season during which the University of Hawai'i defeated a college team for the first time, beating the Pomona Sagehens, champions of the Southern California conference, by a score of 25 to 6. Previously the team had been alternately referred to as the Pilipili Lads ("pilipili" in Hawaiian has connotations of sticking together), the Rah Rah Boys, the Collegians, the SATC Eleven (referring to the Students

Army Training Corps of World War II), and the Deans. See *Ka Leo O Hawaii* 10 November 1926.

³⁸ J. P. Cooke, president of Alexander and Baldwin, donated \$1500 prior to the 1915 football season for the construction of an athletic field. Jennie Ashford, first female Regent, former College special student, and wife of a Circuit Court judge, had persuaded Cooke that a field for football, baseball and track was important to the vitality of the College. See Kittelson, "The History of the College of Hawaii" 92; College of Hawai'i, *Biennial Catalogue 1916–1918* (Honolulu: College of Hawai'i, 1916) 11; *Ka Leo O Hawaii* 10 November 1926. The 1915 team lost only once to Kamehameha in the first game of the season 0–7, then beat McKinley 17–0, McKinley again 24–6, Punahou 15–13, Mills 50–0, Kamehameha 20–0, and McKinley a final time 19–0. It is not clear why the team was excluded from the league.

³⁹ *Ka Palapala*, 1917 11. The territorial championship meant that the College had beaten all the teams (with one tie) in the senior football league that included teams from the military and different areas of town and included many players with much more experience.

⁴⁰ HSB 25 March 1939; Kittelson, "The History of the College of Hawaii" 91; *Ka Palapala*, 1917 10.

⁴¹ Kittelson, "The History of the College of Hawaii" 55; *Ka Palapala*, 1920 105. In 1908, when the new statue of President William McKinley was being unveiled at the neighboring high school campus on Young Street, Tracy held an unveiling of his own before other students. When Tracy pulled the drawstring, the "statue" turned out to be the skeleton used in anatomy classes for much of the early years of the College. See Krauss, "Some O The Founders Reminisce" 20.

⁴² College of Hawai'i, *Report of the Board of Regents to the Legislature of 1915* 24.

⁴³ *Ka Palapala*, 1916–1920 passim; Tamura, *Americanization, Acculturation, and Ethnic Identity* 188–197.

⁴⁴ Only a few isolated instances of *haole* names misspelled can be found: Louise Gulick listed as *Louis* under a collage of the first five graduating classes and A. Hebard Case listed as *Helbard* in the September 1930 issue of the UH Alumni Magazine (p. 12) but correctly in all other publications as well as the March 1930 issue of the alumni magazine (p. 13).

⁴⁵ Herbert Keppeler, "Quarter Century of Varsity Sport," *Hawaii Alumnus* 6 (1932) 6, 15. Rice was called the fastest human in Hawai'i at the time when in 1911 he nearly single-handedly beat O'ahu College and Kamehameha in the final track meet of the season, when he scored 30 of the College's 42 points (38 for O'ahu College and 24 for Kamehameha) by breaking the 220-yard dash record, tying the 100-yard record, and coming within two fifths of a second of the records in the hurdles and half-mile run (Keppeler, 1932 p. 6).

⁴⁶ *Ka Palapala*, 1920 24. When special students are included, the proportion of women increases, since most of those enrolled in special courses were women. See College of Hawai'i, *Annual Catalogue*, 1908–1920 passim.

⁴⁷ Kittleson, "The History of the College of Hawaii" 117–120; Edward R. Beauchamp, "The Case of Hawai'i's First Test of Academic Freedom," *Honolulu Magazine* (February 1988) 98–99, 108–109.

⁴⁸ College of Hawai'i, *Report of the Board of Regents to the Legislature of 1919* 7; Kittleson, "The History of the College of Hawaii" 122. On 1 October 1918, 54 men were inducted into the SATC and were driven to Fort Shafter the next day for physical exams. Three were denied induction for flat feet and one for being underweight.

⁴⁹ Kittleson, "The History of the College of Hawaii" 124–125.

⁵⁰ College of Hawai'i, *Report of the Board of Regents to the Legislature of 1915* 6; Kittleson, "The History of the College of Hawaii" 96–101.

⁵¹ Kittleson, "The History of the College of Hawaii" 110.

⁵² Kittleson, "The History of the College of Hawaii" 110.

⁵³ *Ka Palapala*, 1917–26, passim; *Alumni News*, 1928–30 passim. Kuwamoto is not included in this total because he died in his senior year.

⁵⁴ *Ka Palapala*, 1917 61.

⁵⁵ Unless otherwise noted, information on the play comes from Krauss, "Some O The Founders Reminisce" 14; and Foster, "Reminiscences of Former Days" 33.

⁵⁶ College of Hawai'i, *Report of the Board of Regents to the Legislature of 1913* 17.

⁵⁷ Krauss, "Some O The Founders Reminisce" 14.

⁵⁸ College of Hawai'i, *Report of the Board of Regents to the Legislature of 1915* 25.

⁵⁹ We gratefully acknowledge the research done by Stan Ali and Paul Wermager.

⁶⁰ *Honolulu Advertiser* 20 November 1925.

⁶¹ Esther H. Mumford, *Seattle's Black Victorians* (Seattle: Ananse Press, 1980) 81, 98; Deborah Willis, ed., *J. P. Ball, Daguerrean and Studio Photographer* (New York: Garland Pub., 1993) xiv–xix.

⁶² *Husted's Directory of Honolulu and the Territory of Hawaii*, 1903–1907 passim; Alice A. Ball, Seattle High School Permanent Record, Seattle Public Schools, Archives and Records Management Center, Seattle; John S. B. Pratt, *The Hawaii I Remember* (Kāneohe, HI: Pratt, 1965) 18; Tyee, v. 13 (Seattle, WA: University of Washington, 1914) 90.

⁶³ College of Hawai'i, *Report of the Board of Regents to the Legislature of 1917* 10; Washington State, Board of Health, Bureau of Vital Statistics, Death Certificate of Alice A. Ball. Her death certificate is unclear about her exact cause of death.

⁶⁴ *Honolulu Advertiser* 20 November 1925; Harry T. Hollman, "The Fatty Acids of Chaulmoogra Oil in the Treatment of Leprosy and Other Diseases,"

Archives of Dermatology and Syphilology 2 (1922) 94–101; John Trautman, "The History of Leprosy," in Robert C. Hastings, ed., *Leprosy* (New York: Churchill Livingstone, 1994) 17; Robert R. Jacobson, "Treatment of Leprosy," in Hastings, ed., *Leprosy* 317–18; College of Hawai'i *Report of the Board of Regents to the Legislature of 1919* 13; *Ka Leo O Hawaii* 8 January 1927. See also Arthur L. Dean and Richard Wrenshall, *Fractionation of Chaulmoogra Oil* (Washington, DC: GPO, 1921); Jonathan T. McDonald and Arthur L. Dean, *The Treatment of Leprosy* (Washington, DC: GPO, 1920).

⁶⁵ College of Hawai'i, *Annual Catalogue February 1911* 85; College of Hawai'i, *Annual Catalogue 1911–1912* 82; *Ka Palapala*, 1920 22; Shiramizu, "Story of Fighting Deans" 3.

⁶⁶ Harriet Kuwamoto, interviewed by Joe Rossi, 25 March 1992, in Center for Oral History, *An Era of Change: Oral Histories of Civilians in World War II Hawai'i*, v. 1 (Honolulu: COH, University of Hawai'i, 1994) 280–281; Florence Maehara, personal letter to Allen Awaya, 14 October 1998; *Star-Bulletin* 10 December 1917.

⁶⁷ *Star-Bulletin* 5 November 1917; *Pacific Commercial Advertiser* 6 November 1917.

⁶⁸ *Star-Bulletin* 5 November 1917; *Pacific Commercial Advertiser* 6 November 1917.

⁶⁹ *Pacific Commercial Advertiser* 6 November 1917. Kuwamoto was the first football player to die from game injuries in Hawai'i. But only a month later a quarterback with the Fort Kamehameha team, Calvin Irwin, was tackled and suffered broken ribs that caused heart damage and death. These fatalities were said to be the first two over the thirty years of organized football in the Islands. See *Star-Bulletin* 10 December 1917.

⁷⁰ "Special Faculty Meeting, 29 May 1918," folder 2, Faculty Minutes 14 March 1918–1 March 1919, Box 2, A1900:010, Early Faculty Governance, 1908–1936, University Archives, University of Hawai'i Mānoa.

⁷¹ *Ka Palapala*, 1917 62.

⁷² Shiramizu, "Story of Fighting Deans" 2; Foster, "Reminiscences of Former Days" 33.

⁷³ College of Hawai'i, *Register of Officers and Students 1913–1914* 8; Helene T. Morita, "Class News," *The University of Hawaii Alumni Magazine* 3:2 (September 1930) 12.

⁷⁴ Morita, "Class News" 12.

⁷⁵ *Hawaii Alumnus* 6 (1932) 8; Edwin H. Bryan, "From the President," *The University of Hawaii Alumni Magazine*, August 1931 6.

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Voices of Future Scientists: Factors Affecting Science Interests of Diverse Students

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A survey was administered to high school chemistry students to investigate scientific literacy practices at home and activities or people at home and in school that influenced them to become interested in science. Findings indicate that a wide range of activities initially triggered their interest in science, and most became interested before high school. Additionally, most students began receiving science books in elementary school or earlier, with girls receiving them at a younger age. Plans to take college science classes and to read science books after college were both related to selecting science books on their own and having a person who encourages their science interests. Students made a number of suggestions for ways that teachers and parents could support their science interests. These findings have implications for including science literacy as part of the K–12 science curriculum, especially for minority students, who often feel alienated from the scientific enterprise.

National needs are often cited as the reason for concern over who will become America's future scientists (Colwell, 2000). But there are compelling reasons other than global technological and economic superiority for concern. The historical dominance of white males in science contributes the issues of ethnic and gender equity in the workplace. Science philosophers and historians who examine which science questions are selected and prioritized for research find that gender, ethnicity, social class, and other cultural variables play important roles in the shaping of scientific knowledge (Jacob, 1988; Harding, 1993). Sociologists who study the social world of scientists find that the culture of science itself, that is, the scientific community's social expectations and communication practices, presents barriers to women and minorities (Eskowitz, Kemelgor, Neuschatz, & Uzzi, 1994; Chinn, 1995a). Underrepresentation of minorities in science leads to few role models in industry and higher education at a time when nonwhite students are becoming an increasing proportion of the school population. Women account for only 16% of scientists in the U.S., with Asian Americans comprising 5% and Native Americans 1% (Kahle & Meece, 1994).

Atwater (1994) emphasizes the importance of ethnic and gender barriers when she writes

The more an individual resembles the "typical scientist" the lower are his costs. The tremendous personal cost that results from the combined effect of being a scientist, a woman and a member of a racial or ethnic group was frequently alluded to. . . . The feeling of differentness, which for most of the conferees began to develop as early as their interest in science, was reinforced continually by the recurrent experience of being the only woman in so many situations. (*The Double Bind: The Price of Being a Minority*, cited in Atwater, 1994, p. 564 and Malcolm, 1989, p. 15)

In addition to gender and ethnicity, family characteristics are associated with entry into science. It has been repeatedly noted that scientists tend to come from families headed by science, professional, or managerial parents and that children who become scientists and engineers start becoming mathematically and scientifically literate at an early age (Zuckerman, 1971; Webb, 1990; Koshland, 1997). Unfortunately, at one third of the 14 million children who live in poverty, minority children are overrepresented among the impoverished and underrepresented in the middle class. This has an impact on educational equity: students from poor neighborhoods suffer chronic shortages of qualified science teachers who are likely to provide the high quality and hands-on science learning these students find interesting and meaningful (Atwater, 1994; Costa, 1995; Chinn & Iding, 1997).

In this context, Costa's (1995) finding that high school "students strongly alienated from schooling and science were often minorities [while] a large percentage of the students whose worlds of family and friends were congruent with the worlds of science and science were white males" (p. 316)

shows that science educators still have much work to do. Costa notes (after Tobias, 1990) that a 1960 study of NASA scientists found that 80% of them had made their decision to embark on a science career prior to high school graduation. Her point that "outside activities had as much or more to do with their decision" (p. 319) suggests that a fertile area of research lies in exploring the informal science learning of younger students, especially those from minority and economically deprived circumstances.

Chinn's (1995b) interviews with ethnic minority women engineers in Hawai'i suggest that racial stereotyping and academic tracking practices that begin in the elementary grades are especially detrimental to minority students. The few Polynesians and Filipinos who enter the college preparatory mathematics and science classes dominated by middle class students find that peers of their ethnicity and socioeconomic background are concentrated in classes with lower academic and career expectations. A Filipino/Hawaiian mechanical engineering senior reported that her friends who attended the same high school are already so differentiated by their academic and career experiences that in social interactions "my working friend feels excluded, like an outcast, like she's the odd one."

Thus, it is important to examine how diverse students develop and maintain their interests in science in order for K-12 teachers to be more effective in developing and maintaining the science interests of underrepresented minorities. With our student population of predominantly Asian American and Hawaiian students, we felt that fostering these students' interest in science was especially important. Not every student like the woman engineer above has parents who actively develop their childrens' academic and science interests and abilities. Her resilience enabled her to interact, even team up on engineering projects with peers who hold racist attitudes. Highly motivated individuals like this woman led us to try to identify factors that were associated with science interests and career choices. What factors shaped students' views of themselves as potential scientists?

In an earlier Hawai'i-based study by the authors, the scientific self-concepts and science literacy practices of predominantly Asian American and Pacific Islander tenth grade students enrolled in an urban public school's college-preparatory chemistry classes were investigated (Chinn & Iding, 1997). In that study, Chinn, a high school chemistry teacher at that time, and Iding, an educational psychology professor, explored students' views of themselves as possible future scientists and investigated the relationship of girls' science literacy practices (at school and at home) with descriptions of current and projected interest in science. Results from their survey indicated that students viewed doing experiments, writing up labs, researching, writing and presenting special reports, and knowing material really well for a test as most like scientists' activities.

Family literacy practices, such as having family science books, having other family members interested in reading about science, and having

science books of one's own at home were associated in various ways with plans to engage in future science-related activities, such as taking science classes in college, majoring in science, or having a science career. Girls tended to view themselves as more effective writers about science than test takers, and boys viewed themselves as better test takers in science than writers about science. This finding supports previous research (e.g., Chinn, 1995b; Kahle & Meece, 1994) in which women tend to do better on written assignments in science and engineering classes. The authors called for a need to emphasize the centrality of writing to the enterprise of science education (Chinn & Iding, 1997).

In this study we developed and administered a follow-up survey a few months later to the same chemistry students from the Chinn and Iding (1997) study. We intended to address a number of questions related to home and school science experiences. Because having science books of their own at home (not textbooks) was most highly correlated with planning to be a scientist in the earlier Chinn and Iding (1997) study, we wondered if it was not simply the extracurricular reading materials, but the social context surrounding the books that could have been associated with students' science interests.

Several specific questions served as the basis of our inquiry:

- Are science books at home self-selected or selected by others? When did students begin receiving science materials?
- What sparked their interest in science? What about science interests them most?
- Who is most important in encouraging interest in science?
- What sorts of school activities influence students to consider a science-related career?
- Do classroom experiences support their interest in science?
- What do students suggest as ways schools and families can support their interests in science?

We thought that the results of our study could provide K–12 science teachers and science educators with students' comments concerning the ways they say they learn best. This information is in line with the National Academy of Sciences' (NAS) recognition that social interactions and culturally shaped beliefs about student learning and teaching practices are foundational to science education. The NAS teaching standards are grounded in the following assumptions (National Academy of Sciences, 1996):

- What students learn is greatly influenced by how they are taught.
- Students' understanding is actively constructed through individual and social processes.
- The actions of teachers are deeply influenced by their perceptions of science as an enterprise and as a subject to be taught and learned.

- The actions of teachers are deeply influenced by their understanding of and relationships with students.

Our findings have implications for science educators. For example, if these ethnically and linguistically diverse students report that their interests in science were inspired largely through interpersonal school-based activities, these findings would suggest that precious professional-development time be allocated to ensuring that preservice science teachers master the social skills and processes involved in developing and maintaining communities of diverse learners (Science Teaching Standard E). If, on the other hand, students report that their interests in science were inspired as much or more often in informal home and community settings, that would suggest that the school science program extend beyond the walls of the school to include family members engaged in science and literacy-related activities such as visits to the library and aquarium, cooking, sports, fishing, and gardening (Science Teaching Standard D).

Method

Student population and science experiences

Students in the three college-preparatory chemistry classes from which the sample was drawn were 69% East Asian (Chinese, Japanese, or Korean). Compared to this public school's overall East Asian population of 50%, this shows that students in these ethnic groups are overrepresented in college-preparatory science. Also overrepresented at 11% are the Southeast Asian (Thai, Vietnamese, or Filipino) students who make up only 5% of the school population. White enrollment at 10% is quite close to their 7% representation in the student body. Clearly underrepresented at 8% are Polynesian students (Hawaiian and Samoan) who make up 20% of students schoolwide. Approximately 22% of the students (primarily of Asian ethnicities) spoke English as a second language. From the same three classes of nearly 90 students that responded to the original questionnaire (Chinn & Iding, 1997), 62 students returned the second questionnaire. Students were administered the second survey near the end of the academic year. Most of the 62 survey respondents, 29 males and 33 females, were sophomores who had taken honors biology in their freshman year and science throughout their middle school years.

Since the faculty of the science learning center had agreed that students experience weekly hands-on learning activities and undertake at least one inquiry or independent project during the year, most students were familiar with active, student-centered learning activities. Learning center teachers, as a group, also agreed to make career information and writing integral to students' classroom learning. Many teachers at this school were familiar with and utilized a variety of cooperative learning instructional strategies.

Students in these chemistry classes had opportunities to attend biweekly science seminars, worked in cooperative lab and presentation groups, and had the option of carrying out solo or small group independent study activities.

Materials

An 11-item questionnaire was developed by the authors to assess the following general areas: students' sources of science books at home (i.e., self-selection or selected by others), activities or people that influenced them to become interested in science, activities in school that might have influenced them to consider a science-related career, assessment of the contribution of their science classes as valuable to their learning, and suggestions for ways for schools and families to support their interest in science.

Procedure

The second author administered the questionnaire to her three chemistry classes. Students received 5 points, equivalent to a short homework assignment, for its completion. Sixty-two students returned surveys.

Results

Preliminary data analyses consisted of calculating frequencies and percentages for responses to all items requiring dichotomous (yes/no) responses. Analyses of open-ended responses consisted of categorization of student comments into categories that most closely represented gists of student comments. The categorization was completed by the authors. The questionnaire, with summaries of all responses can be found in the appendix. Major findings are highlighted and briefly discussed in the following sections.

Selection of science books

Items 1 and 2 of the survey dealt with selection of science books and age at which students began to receive science books or materials at home. Forty-seven responses indicated that books were bought for them with no input from them, and 19 responses indicated that they selected their own books. (Several students checked both response options, indicating that sometimes books were selected by them, and sometimes books were chosen by others for them without the students' input). Respondents selected books based upon their interests; 5 did not specify a particular interest, but 10 had interests ranging from astronomy to animals to technology and health.

The overwhelming majority of students (48 respondents) who reported receiving science books or materials indicated they began receiving those materials in the elementary years or earlier, by the age of 12 or younger. The

largest category in a single age group (23 students) began receiving these materials from ages 6 through 9.

Interestingly, there were gender differences between the ages at which students reported having first received science learning materials, with girls receiving them at a younger age than boys (see Appendix). Perhaps girls exhibited more interest in reading about science earlier, and parents reciprocated by giving them science materials and books to read, or perhaps parents purchase more books and reading materials for girls in general and more active science-related toys for boys at younger ages. It is also possible that boys develop interests in receiving science materials later.

Family members in science careers and encouragement by family and others

Items 3 and 6 of the survey dealt with whether students had family members in science and whether there is someone (a family member, friend, or teacher) who encourages them in their interest in science. Eighteen students reported that there was a family member in science (one student had 3). Mentioned most frequently were health-related careers (9) and engineering (6).

When asked if they had a person who encourages them in their science interests (Item 6), 43 said yes, mostly in the form of verbal encouragement (20 responses). One student said parents “talk to me about their own experiences and tell me I can do it.” Another said, “All my teachers have encouraged me, carefully explaining, praising, etc. My parents, especially my dad, REALLY feel science is important. He always says ‘Science and math are the two important fields.’”

Some parents (8 responses) teach or discuss science with their children or provide assistance (5 responses). As students explained, “They encourage me by helping me in certain areas which I have trouble or difficulty in; also they introduce me to interesting subjects and things which I could work in.” Seven students indicated career advice is a source of encouragement, and four said encouragement is provided by providing books or materials.

Activities that are associated with initial interest in science

When asked to report activities that first generated their interest in science (Item 4 of the survey), and the age at which they occurred, students reported a wide range of triggering activities, such as going to the beach, watching TV shows, reading picture books, and playing with science kits. Most became interested in science before they entered secondary school. Fourteen mentioned school or a teacher as generating their initial interest, 12 mentioned specific experiments or science activities, which are probably school related. A student recalled that in second grade, “I started to do hands-on activity—grow green sprouts.” Another mentioned “making ice

cream.” One elaborated on a biology topic: “Learning about the human body in ninth grade. Thing [*sic*] such as chromosomes and the formation of a baby was interesting.”

Several interesting observations can be made about these categories. First, television, with 6 responses, can be seen as a viable medium for sparking student interest in science. Since most of these students were tenth graders at the time of the survey, it is reasonable to assume that future students will experience even more in the way of technologies that can present science (e.g., the Internet and other information technologies). Such technologies, which could conceivably also expand upon video capabilities, might play an even greater role in generating student interest in science.

A second point is the fact that about half of students became interested in science at school. (This is likely to go hand in hand with effective teaching practices that students mention in response to Item 10, “Overall, are your science classes friendly and valuable to your learning?”) Experiments and science activities were cited by 12 students as generating their interest in science. This appears to be a theme that runs throughout the responses to this survey—experiments or hands-on experiences of science are consistently reported by students as effective ways to learn scientific principles, experience the scientific process, and interest them in science (to the extent that some students, in response to Item 11 discussed below, ask for more experiments).

Third, science topics from the everyday (e.g., how a battery works) to the more esoteric, generate interest. This argues that everyday objects can provide “teachable moments” and raise questions that stimulate genuine interest in science. This suggests that exposure to a broad range of topics are useful to generating the specific interests students reported.

Fourth, and very importantly, 33 students reported that they became interested in science at age 12 or earlier, and 10 became interested in the 13 to 15 age range. This indicates that it is important to capture students’ interest early, especially in the elementary years. Unfortunately, as most preservice elementary teachers lack the course and laboratory work required for secondary science teachers, they often feel uncomfortable and unprepared to teach the hands-on, inquiry-oriented lessons students report they enjoy.

Most interesting aspects of science

In response to Question 5, experiments were mentioned 25 times as one of the most interesting aspects of science. This was followed by 18 mentions of particular areas of science that were interesting, including topics related to biology, health/medicine, animals, and so forth. Some of these were general (e.g., space), and some were quite specific. It would appear that providing opportunities to learn about a whole range of topics in science would foster this diversity of interests—providing reading materials, encouraging Internet

use, and explorations of a variety of topics and fields might pique students' scientific interests, perhaps in fields that they would not otherwise be aware of.

Scientific explanations often for everyday events were of particular interest and were mentioned 15 times. Students commented on the power of science as a way of understanding the world. The Polynesian female who wants to be a forensic scientist wrote that it's "how you want to find something out and you do experiments." An Asian American female who wants to be a doctor wrote that it's "what happens everyday that you can't see or notice, but you only see it in a lab or if someone like a teacher points it out to us."

Peer teaching experience

Students in these classes could elect to participate in peer teaching of younger students to fulfill their course requirement of an independent activity. The effect of this activity on their interest in a science career was the focus of Item 7 of the survey. Though only 24 of the students chose this option, 23 students selected "peer teaching" as one of the options under Item 8, that asked them to select school experiences that influenced them to consider a science major or career. This indicates that peer teaching is one technique that can generate a high level of interest in potential science careers among students.

In describing how peer teaching influenced them, 8 mentioned that it increased the interesting or fun aspects of science, 8 mentioned that it increased their understanding of science, 4 mentioned that it increased their understanding of the teaching/learning process, and 4 were made aware of the difficulties of science and/or teaching and their own knowledge deficits. Student comments indicate that peer teaching is an effective way of meeting students' affective needs for social interaction while meeting their content-based academic needs.

Factors influencing choice of science as a career

In response to Questions 8 and 9, which asked about activities in school that influenced students to consider science careers or majors, and factors impacting decision on a science career, it is significant that the top 3 responses, doing experiments (33 responses), reading interesting science material (29 responses), and working in problem-solving teams (30 responses) have to do with the activities that characterize communities of practicing scientists (Locke, 1992). However, the importance of successful school experiences in motivating students to consider careers in science can be seen in the selection of "getting good grades" by nearly half of students (28 responses). Clearly, instructors have a crucial role in planning, implementing, and assessing science learning activities that are both

engaging and able to be successfully carried out by a diverse population of students.

Other school science activities that mirror the professional activities of scientists were mentioned, but at lower frequencies: research project/programs (24), peer teaching (23), writing science papers (14), and attending science seminars (10). These selections could be taken to suggest that teachers should plan for assignments that actively involve students in inquiry, writing, and the presentation of written results; activities that are central to the development and dissemination of new knowledge in science at all levels.

Deciding on a career focus related to science

We had previously found that around one third of the students already had a science-related career focus, and close to half were considering majoring in a science-related area in college (Chinn & Iding, 1997). In response to the present survey, 14 had already identified specific fields ranging from astronomy to health sciences. Of the 62 respondents, only 7 reported they had no interest in a science career, and 4 were undecided. These findings could be taken to indicate that teachers should make a point of linking the science content and skills they teach to future occupational uses. In this way, career exposure becomes infused continuously through their science coursework encouraging students to plan academic and career goals as they link their classroom learning to the adult working world.

School, family, or a combination of both activities could trigger interest in particular fields: A Polynesian female wrote, "I decided when I saw a video on my interesting career [forensic science] and then my mom knows a guy that is in that career and he talked to me. I also decided when I went to the police station." Another reported, "I took the health occupations class with Mrs. Fong this past year. We went volunteering, participated in field trips. I learned a lot about careers in the health field. It was all very interesting." Another wrote, "My uncle works in the pharmacy and I found it interesting that there were so many types of medications. It also made me curious and made me wonder how medications work and affect the body." The variety of events that trigger students' interests in potential careers indicates that teachers not only utilize a wide range of instructional and learning activities but also provide opportunities for students to bring their interests into classroom discourse.

Other factors associated with future science plans

In order to further examine the question of whether the selection of home science books, presence of family members in science careers, encouragement, or gender predicted plans for future science activities and careers, we carried out seven full multiple regression analyses (see Tables 1 and 2). For each analysis, the predictors included gender, books selected

without students' input, books selected by students themselves, age when students started receiving science books, whether students had scientists in the family, and whether there was someone who encouraged students' interest in science. The criterion variables for the seven analyses were derived from these students' responses to questions on the initial questionnaire (described in Chinn & Iding, 1997). These were plans to be a scientist, to major in science, to take science classes in college even if they're not required, to read magazines and articles about science topics after finishing college, to have a science career, and to read books about science after finishing college.

Of these analyses, two yielded statistically significant results. The first (see Table 1) was on plans to take science classes in college as the criterion variable. The predictors that achieved statistical significance were science books selected by the students themselves ($p < .05$) and reporting that there is a person who encourages their interest in science ($p < .05$). The second was

TABLE 1

Multiple Regression Analysis for Predicting Plans to Take Science Classes in College Even if Not Required ($R^2 = .26$)

Predictor	<i>t</i> -value	<i>P</i> -value
Gender	-1.64	.11
Books selected by others	1.36	.18
Books selected by self	2.41	.02*
Age first received science books	-.18	.86
Family member in science career	-.37	.71
Person encourages science interest	2.32	.03*

* $p < .05$.

TABLE 2

Multiple Regression Analysis for Predicting Plans to Read Science Books After College ($R^2 = .24$)

Predictor	<i>t</i> -value	<i>P</i> -value
Gender	.97	.34
Books selected by others	1.60	.12
Books selected by self	2.05	.05*
Age first received science books	.50	.62
Family member in science career	-.33	.74
Person encourages science interest	2.15	.04*

* $p < .05$.

on plans to read books about science after finishing college. The same predictors, selecting own science books ($p < .05$), and having a person who encourages science interest ($p < .05$) achieved significance.

Apparently, perceiving that there is a person who encourages one's interest in science could be even more important than other factors, such as having a relative in a science-related career. This might be especially important for minority and lower socioeconomic-status (SES) students, who might not have such family members.

Being able to select their own science books implies that the students' own choices and interests are being encouraged as well, and appears to be more important than having books bought for them on science-related topics, without their input. Parents from lower SES backgrounds who cannot afford science books might achieve the same or a similar positive impact by encouraging the selection of science books as recreational reading from the library.

In examining factors associated with future science plans, a set of correlational analyses (*phi* coefficients) was carried out between the factors described above and future science plans as well as lack of future science plans (indicated by agreement with statements like "I don't think I could ever be a scientist" from the first questionnaire described in Chinn & Iding, 1997). Some of the correlations that emerged were redundant with results from the multiple regressions that we have just discussed. For example, there were statistically significant relationships between plans to take science classes in college even if they're not required and encouragement $r(52) = .31$, ($p < .05$); and plans to read science books after college and encouragement $r(52) = .35$, ($p < .05$). However, there was also a statistically significant correlation between reporting that reading interesting material in science had influenced them to consider careers in science and encouragement $r(62) = .34$, ($p < .05$). All of these results appear to underscore the connection between science literacy practices, enduring science interests, and encouragement by others.

Finally, a thought-provoking negative correlation emerged between reporting that working in problem-solving teams influenced them to consider a science major or career and agreement with the statement, "I know that I will never have a career in science" $r(52) = -.39$, ($p < .05$). This could be taken to imply that collaboration in the science classroom, which mirrors the kind of collaboration that takes place between scientists, can have a positive effect on students' views of science as a career choice. This is underscored by a correlation that emerged between having been a peer teacher in science and agreement with the statement, "I could be a science teacher" $r(52) = .32$, ($p < .05$). These positive views of the collaborative nature of real-world science indicate that teachers may help to dislodge conventional, stereotypical notions of scientists as lone or sole practitioners in isolated laboratories by developing communities of learners.

Experiences in science classes

In response to Question 10, "Overall, are your science classes friendly and valuable to your learning? Please explain," 78% of the students said "yes," 17% gave moderately positive responses like "Yeah, somewhat," and only 3 students were negative. Some students commented about what they found interesting. For example, one student wrote, "Yes, they help you learn about the world around us, what things are made of, how they got there, why they're there." Others commented about the kinds of activities that were effective: "I found working on labs or in groups very pleasant. Group work helped a lot because my friends were able to help me."

These responses show that students rate the value of their classes in multiple ways. The challenge to the science teacher is to develop and maintain a community of learners in which high quality science learning takes place.

How schools and families can support interest in science

In response to Question 11, "What could families or schools do to support your interest in science", a very broad range of suggestions were given. The most frequent were make science interesting (11), provide hands-on activities or experiments (7), provide equipment (6), provide general funding (6), and provide assistance (5). Student comments indicate they believe that science is important, applies to everyday life, and should be taught when children are young. Their comments suggest that teachers and parents can motivate science students by

- developing science interests: "Provide more magazines and reading materials pertaining to science stuff" and "get you started at a younger age."
- emphasizing inquiry and hands-on activities: "Schools or families should do hands-on things that show interesting things in science," and "should encourage independent projects in any science topic."
- making connections between science and everyday life: "Schools could find ways to catch people's attention to the many interesting ways one can apply science knowledge to his/her everyday life."
- and de-emphasizing the more stressful components of school learning: "Families should support effort and help you out more! Schools should decrease the stress put upon the students."
- providing funds for equipment and books.

The theme of increased resources emerged a number of times. As we think of increasing students' interest in these areas we also need to consider the resources provided to science programs. Although science concepts can be taught through everyday objects, students also recognize that technology is an integral part of science. By the time they are in high school they want to learn science using some of the equipment and computers scientists employ for similar purposes.

Many of their teaching suggestions reiterate themes in the science education literature regarding the value of hands-on activities, group activities, and adequate science supplies and equipment. It is clear that these are some of the most effective ways of teaching science, and students' suggestions provide validation for these ideas.

Discussion

The finding that working in problem-solving teams, doing experiments, and reading interesting science material are the school activities that most influenced students to consider science-related majors/careers supports findings by Semb and Ellis (1994) that students display the highest levels of retention under two conditions: when they are actively engaged in high level, process-oriented learning and when the learning is connected to job-like situations. It is significant that these students identified "doing experiments and writing up labs" as the activities that made them feel most like scientists in the earlier survey. It seems reasonable that students will tend to value and remember activities that they believe have a potential impact on their future. This implies that teachers should actively help students connect their science learning to career options and point out role models who are especially relevant to students from groups that are underrepresented in science.

It appears that family science activities and activities engaged in outside of class play a strong role in students' views of themselves as future scientists, as students' anecdotal reports of early experiences that triggered their interest in science convey. This supports the findings of Chinn and Iding (1997) indicating that family literacy practices related to science are correlated with high school students' plans to engage in future science activities, such as taking science classes in college, or planning careers in science. This suggests that it is important for K-12 teachers to establish and maintain multiple, informal and formal channels of communication between families and school. Elementary teachers can play a major role in supporting science literacy and student interests through familiarizing children with science reading materials in school and encouraging parents/guardians to accompany children to libraries and community science activities.

For example, school science activities for families can take the form of open houses where families visit science fairs and/or students lead science activities, content and/or career presentations by family members, suggestions for television programs to watch and discuss, and suggestions for science-oriented community events students and families could attend. Portfolios of student work can be taken home for parents to review, discuss, and comment on; even if content may be unfamiliar, an opportunity is created for conversations about science learning, interests, and goals.

Events in which students can accompany family members on visits to classrooms may be especially important for students from nonmainstream ethnic, linguistic, and working-class families. In the second author's experience, science learning center open houses in which students lead science activities are effective, nonthreatening ways for parents of limited English ability to become familiar with their children's teachers and science learning. Encouraging the whole family to attend also gives students the opportunity to orient their younger family members to high school settings and activities. Stanton-Salazar (1997) holds that the "development of social ties to institutional agents [teachers] is crucial to the social development and empowerment of ethnic minority children and youth precisely because these ties represent consistent and reliable sources from which they can . . . obtain other key forms of institutional support" (p. 15). In terms of social network theory, teachers who develop positive relations with their students help to link students' worlds of family and community to the world of schools and their control over mainstream society's educational resources.

Grades, especially good grades, indicate to students how well they are likely to do in their future science studies. Brophy (1998) suggests that student motivation is a function of the learner's expectation of future success at a task and the value of the task's processes and rewards. This implies that science teachers need to orchestrate social processes that support learning so that both processes and learning outcomes are not only valued by students but assessed in ways that enable a diverse population of students to experience success. For women, who tend to view themselves as better writers than test takers this suggests that written assignments be given more emphasis and tests be less emphasized. For minority students who find that mainstream school science is a body of unfamiliar vocabulary and abstract concepts unrelated to their own cultural worlds, it means teachers need to connect topics to their students' lives, value and encourage the sharing of cultural knowledge and experience, and link science concepts to applications and real world examples. Aikenhead (1996) suggests that all students "border cross" in varying degrees when they enter the unfamiliar subculture of school science. This sociocultural perspective suggests that teachers play especially critical roles in facilitating the successful entry of students whose cultural worlds are the most different from the predominantly white, male, middle class world of secondary science teachers and scientists (National Science Foundation, 2000).

Social factors related to the development of a supportive community of science learners are critical to students' choice of science careers. This point supports the NAS's assumptions that science teaching and learning are fundamentally social processes. Peer teaching can be an effective way to help students learn science, become aware of their own knowledge levels and weaknesses (increases metacognitive awareness), have pleasurable experiences of working with peers, and even foster interest in science

teaching as a career choice. Teachers also need to be skilled in structuring the social processes that accompany hands-on activities/experiments. Teaching strategies that involve students in the doing of science, communicating results, and communicating what is interesting in science mirror the activities of communities engaged in the construction of science knowledge and are rated positively by students.

Conclusion

Future directions in our research include a more detailed examination of family and extracurricular scientific literacy activities and their contribution to students' interest in scientific careers. We would like to explore cultural and socioeconomic patterns of early science literacy and explore home and school practices that are most effective in developing students', especially if from minority groups, interest in science. As one example, although we asked students about books they owned, we neglected to ask about their library practices. Students are more likely to borrow than buy books, and families with lower incomes are more likely to support their children's literacy development by taking them to the library than by buying them books. Answers to these and other questions may be especially useful for the development of programs that encourage members of underrepresented groups to consider science-related majors and careers.

Further directions for research in this area can also involve addressing some of the limitations of this particular study. For example, surveying and/or interviewing more students and parents at a wider range of schools in Hawai'i would provide a more complete depiction of the range of science interests, activities, and literacy practices among students at school and at home. Additionally, it would provide a vehicle for students of a wider range of ability levels to express their science interests and suggestions for ways to support these interests.

Despite these limitations, we believe our findings provide some support for the National Academy of Sciences' sociocultural perspectives that ground its science teacher standards. Furthermore, we believe that our findings support the suggestion that K–12 science educators pay as close attention to the social context as the science content of their curriculum and instruction. The emergence of interests in science during the elementary years, often through family activities, was a finding that is consistent with earlier studies. Clearly, teachers need to be responsive to students' needs and interests in developing a learning community (including their family and informal science resources) in which students actively participate in meaningful science learning that empowers them to make critical and constructive personal, social, and political decisions.

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Appendix

Science Survey With Results

Name _____ Period _____

1. If you have science books of your own at home, how are they typically selected? (Check all of the following that apply):

They are given to me/bought for me with no input from me	47
They are bought/selected by me. I like books that	19

Qualities of preferred books

are interesting	5
deal with specific topic of interest	18 *
uncodeable/other	3

* Some students described more than one topic. Each topic is counted separately.

2. If you have science books of your own at home (not your textbooks), how old were you when you first began to get books or science reading materials?

	<i>Overall</i>	<i>Girls</i>	<i>Boys</i>
1-5 years old	9	6	3
6-9 years old	23	16	7
9-12 years old	16	6	10
13-15 years old	7	4	3
older than 15	5	0	5

3. Is anyone in your family in science, engineering, or health careers? Who, and in what field?

Yes	18
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*Careers of relatives***

Health care	9
Engineer	6
Scientist	3
Biology	1
Airplane technology	1

** Some had more than 1 relative in a science career.

4. What first got you interested in science? How old were you?

Kinds of activities

Television	6
Reading	3
School	13
Experiment or science activity	12
A teacher	1
Specific science topic	11
Outdoor experience/nature	2
Specific career interest/role model	2
Not interested	5
No response	7
Uncodeable/other	1

Age initially interested in science

12 or younger	33
13–15	10

5. What are some of the things you find most interesting about science?

Most interesting aspects of science

Experiments	25
Scientific explanations	15
Challenge/discovery	6
Fun	2
Specific interest	18*
Biology	6
Health/medicine	4
Animals	4
Space	2
Ocean	2
Technology	3
Physics	3
Nature	1
Plants	1
Organic chemistry	1
Genetics	1
Uncodeable	1

* Some students listed more than one interest area.

Factors Affecting Science Interests

6. Are there people (friends, teachers, or family) who encourage your interests in science?

	<i>Overall</i>	<i>Girls</i>	<i>Boys</i>
Yes	43	25	18
No	19	8	11

If your answer was "Yes," explain how that person encourages you.

Forms of encouragement

Verbal encouragement	21
Discuss/teach science	8
Career advice	7
Assistance	4
Provide books/materials	4
Other	5
Uncodeable	1

7. Have you been a peer teacher in science?

Yes	24
No	38

If your answer was "Yes," has this affected your feelings about science as a career? How?

Outcomes of peer tutoring

Increases interest in science/fun	8
Increases understanding of science	8
Became aware of difficulty of material/teaching/science deficit	4
Increased understanding of teaching/learning process	4
No effect	3

8. If there is anything you did in school that influenced you to consider a science major or career, what was it? Check all that apply:

Peer teaching	23
Research project/programs	24
Writing science papers	14
Reading interesting science material	29
Doing experiments	33
Attending science seminars	10
Getting good grades	28
Working in problem-solving teams	30
Other	7

9. If you already have a career focus related to science, how did you decide upon your goal:

School or classes	5
Experience with a person in the career	2
Affect or general appeal	6
Career information	1
Specific interest	14*
Teaching	2
Computer science	3
Health/medicine	4
Biology	3
Architecture	1
Engineering	1
Stars	1
Pharmacy	2
Human anatomy/physiology	1
No interest in science career	7
Undecided	4

* Several students selected more than one interest

10. Overall, are your science classes friendly and valuable to your learning? Please explain.

Yes	45
Moderately so	10
No	3

11. What could schools or families do to support your interest in science?

Suggestions for ways schools and families can support science interest

Provide equipment	6
Encourage interest	6
Hands-on activities/experiments/labs	7
Make science more interesting	5
Provide help/assistance	5
Simplify material/make understandable	4
Provide books	3
Provide general funding	6
Increase fun	2
Provide more courses in specific interest	1
Decrease stress	1
Provide good teachers	1
Provide field trips	1
Guest speakers and introduction to careers	1
Use more visual aids	1
Use group activities	1
Start learning sooner	1
Provide more science opportunities	1
Not interested in science	2
Don't know/no comment	5
Illegible	1

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***Ke A'o Hawai'i (Critical Elements for
Hawaiian Learning): Perceptions of
Successful Hawaiian Educators***

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Native Hawaiian education is in transition. Recognition of the impact of the cultural context and Hawaiian ways of knowing and learning are being acknowledged. This paper describes a study to identify critical elements for Hawaiian learning from the perspective of successful Hawaiian educators. The results identify two critical factors to incorporate in designing educational initiatives—authentic environments and experience-based learning. The findings and methods used in the study have been developed from a foundation of Hawaiian protocol and culture.

E lawe i ke a'o a mālama, a e 'oi mau ka na'auao.

He who takes his teachings and applies them increases his knowledge.
(Puku'i, 1983, #328, p. 40)

In recent years, many programs grounded in the language and culture of Hawai'i have been developed for Hawaiian students. In 1999, Hawai'i legislators passed a bill allowing the establishment of charter schools. Hawaiian communities are becoming empowered with increased opportunities to obtain grants and funding for community-based initiatives (Kawakami, 1999). There has been an increase in programs in both English and Hawaiian language environments targeting Native Hawaiian students. Six charter schools are serving 1,500 students as part of the grants awarded to fund planning for Hawai'i's New Century Public Charter Schools. Other efforts are underway for the submission of numerous proposals requesting charters (Hawai'i Department of Education, 2000). A majority of these hope to provide alternative educational programs and settings in order to focus on learning that is built on a foundation of Hawaiian language and culture. In addition to charter school efforts, programs in English language settings include the Wai'anae High School Hawaiian Studies Center and the University of Hawai'i at Hilo Nā Pua No'eau, Center for Gifted and Talented Native Hawaiian Children. The 'Aha Pūnana Leo Hawaiian medium education program has expanded across the state with pre-kindergarten through undergraduate and graduate level courses of study. The first cohort of students in Hawaiian medium education completed the pre-K to 12th grade program in 1999. Ka Lama o Ke Kaiāulu's Education Academy and Education Cohort ground curriculum and campus locations for teacher training in the culture of Hawaiian communities on the Leeward coast of the island of O'ahu (Au & Maaka, 1999).

The Native Hawaiian Education Act and the Office of Hawaiian Affairs provided funding for Nā Pua No'eau, the University of Hawai'i at Hilo's Center for Gifted and Talented Native Hawaiian Children, to research and define curriculum models that incorporate Hawaiian values and culture (Nā Pua No'eau, 1999). We conducted this study in three phases to identify characteristics of the Nā Pua No'eau curriculum, grounded in Hawaiian beliefs about learning. In Year 1, we focused on identification of key elements of educational programming for Hawaiian students. In Year 2, we focused on obtaining information about implementation of these elements at two different sites. In Year 3, we will focus on the degree to which the elements can be applied into a middle school curriculum in the public school system. This paper will focus on the work conducted in the first year.

While the Hawai'i Department of Education is restructuring schools and curriculum to implement the Hawai'i Content and Performance Standards (Office of Accountability & School Instructional Support, 1999), the standards are aligned with professional organizations' standards, which maintain a

perspective of Western definitions of core knowledge. Content and performance related to Hawaiian language and cultural content have not been defined, although efforts are underway to craft standards that will reflect the indigenous culture (M. M. Bruno, personal communication, May 5, 2000). Alaska Standards for Culturally Responsive Schools from the Alaska Native Knowledge Network (1998) provide one model for the development of such standards. As the design of learning environments and opportunities for all students to reach those standards proceeds (Office of the Superintendent, Hawai'i DOE, 2000), the cultural context of Hawai'i as foundation for these educational initiatives must be considered. Principles of culturally grounded education are needed to inform the development of these programs.

Successful incorporation of Hawaiian ways of knowing and learning are necessary to capitalize on the culture and traditions unique to these islands and the Hawaiian people. This paper describes a study designed to identify critical features of successful education for Hawaiian learners. We used survey methods to obtain data from educators who were nominated by their peers as highly successful teachers of Hawaiian students. The results of these interviews suggest two components to consider in the development of Hawaiian education programs: (1) activities grounded in authentic environments and (2) activities that incorporate experience-based, hands-on learning. These critical features may be incorporated in the design and implementation phases of new programs and used in formative evaluation and monitoring of developing programs. This study is the first in a three-part scope of work designed to identify and disseminate information on critical features of culturally grounded education for Native Hawaiians.

The Study

Purpose

Hawaiian culture and tradition are unique to these islands. For Hawaiians, the abundance of relationships to the *āina* (the land), the *ʻohana* (family and friends, past and living), and the community provide the context for learning and living. This context arises from the past, the present, and the future and the spiritual and physical environment of each place (Meyer, 1998; Puku'i, 1983). Despite the ancient and rich heritage of the Hawaiian people, many of today's young Hawaiians do not prosper in the present-day systems of education. Native Hawaiian students comprise about one fourth of the school-age population in Grades K–12. Only slightly over half of the Native Hawaiian population graduate from high school, and fewer than 10% of those graduates go on to college (*Native Hawaiian educational assessment*, 1993; Office of Hawaiian Affairs, 1993). Other indicators such as high rates of absenteeism and retention in grade further document their failure to prosper in Hawai'i's public schools (*Native Hawaiian educational assessment*, 1993).

Aspects of the Hawaiian culture, which could provide a foundation for successful school experiences are absent for the majority of Hawaiians. Efforts to supplement formal education have been undertaken by a number of local programs designed to embed Hawaiian culture within the curriculum or to embed the curriculum within a Hawaiian cultural context. In educational environments, infusion of Hawaiian culture and language appears to be multifaceted. In order to utilize resources effectively in program development and implementation, standards or criteria need to be identified to provide guidance for designing effective learning opportunities for Hawaiian students. The purpose of this study is to identify elements critical to educational programs for Hawaiian students.

One perspective for explaining the lack of success for Hawaiian students is the mismatch of the cultures of school and home that was the foundation of the Kamehameha Early Education Program (KEEP) described by Jordan and Tharp (1979). The work of Erickson and Mohatt (1982) and Phillips (1992) supports this mismatch-of-culture thesis with other indigenous groups as well. The deliberate and systematic suppression of Hawaiian culture and language in the development of the present-day statewide public-education system is described by Dotts and Sikkema (1994).

In the 1970s and 1980s, KEEP developed a successful language arts program for dissemination to communities with high percentages of Native Hawaiian students (Darvill, 1981). KEEP focused on a "least change" model of integrating change into public school classrooms that focused on instructional strategies and organizing classrooms to enable students to utilize competencies and prior knowledge developed in their lives out of school. While that program was discontinued in the mid-1990s, other initiatives aimed at developing success for Native Hawaiians continued to incorporate language and culture as both content of curriculum and instructional strategies. Among these efforts is the work of Nā Pua No'eau, the Center for Gifted and Talented Native Hawaiian Children at the University of Hawai'i at Hilo. This program has offered a number of programs incorporating Hawaiian culture and values. Its purpose is to identify gifted and talented students and to increase their aspirations and self-esteem through education. These programs had been developed and implemented over the past ten years. This study was designed to identify the assumptions underlying Nā Pua No'eau's program implementation.

Cultural knowledge and practice are an integral part of the Nā Pua No'eau program. The program is based on the views represented by the "situated perspective" described by Greeno, Collins, and Resnick (1996). This perspective suggests that "the physical and social contexts in which an activity takes place are an integral part of the activity, and that the activity is an integral part of the learning that takes place within it." (Putnam & Borko, 2000). Research has described Hawaiian ways of being and learning in

ancient times (Puku'i, Haertig, & Lee, 1972) as a background for Hawaiian ways of knowing in the present day (Meyer, 1998).

Methodology

As a project within Nā Pua No'eau, the Center for Gifted and Talented Native Hawaiian Children (NPN) at the University of Hawai'i at Hilo, this project was designed to reflect the values of the Center. The focus on Hawaiian values of *lōkahi* (unity) *na'auao* (knowledge synthesizing aspects of mind, heart, and spirit), and *aloha* (genuine, positive regard for others) led to research focused on the strengths of Hawaiian educators (Nā Pua No'eau, 1999). The rationale for this approach is consistent with cultural practice in that educators who have established a reputation for successfully teaching and working with Hawaiian students exhibit and cultivate *na'auao*. This allows them to perceive and work with Hawaiian students in ways that develop *lōkahi* and *aloha* with and for their students. The purpose of this study was to examine their perspectives on Hawaiian education.

Informants

A total of 16 educators were identified for the study. NPN staff were asked to nominate individuals whom they considered excellent teachers of Hawaiian students. All informants had worked with NPN as teachers or program coordinators in the past. The informants had experience teaching pre-kindergarten to graduate-level courses in college. Six have education-related experiences with students from kindergarten through college. Eight individuals have experience primarily with secondary students and two with elementary students. The informants had teaching experiences ranging from 5 to 35 years. All were currently engaged in education at the time of the study.

Questionnaire

The questions in the interview were designed to elicit insights about learning and instructional situations for Hawaiian students. The questions were originally drafted as a questionnaire to be distributed to informants and returned by mail, but in the initial round of contact, it became apparent that a written questionnaire would not be adequate to allow for culturally grounded interactions. The questions were then modified to provide an outline of talking points to be used in conversations. The talking points focused on the following aspects of learning for Hawaiian students:

1. Hawaiian ways of learning,
2. Significance of relevant ways of learning,
3. Program design process,
4. Curriculum focus,
5. Instructional strategies, and
6. Appropriate assessments.

Questions addressed general characteristics as well as specific dimensions of curriculum focus, instructional strategies, and assessments.

The adaptive methodology is described in the work of Lincoln and Guba (1985), Lofland and Lofland (1995), and Miles and Huberman (1984). Lincoln and Guba (1985) state implications for doing research that guide and substantiate the processes and structure of the methodology conducted in a naturalistic setting, utilizing human interaction as data collection and qualitative methods to represent the multiple realities of Hawaiian ways of knowing. Miles and Huberman (1984) describe a procedure for formulating questions for fieldwork that was applicable and culturally appropriate for this research. Lofland and Lofland (1995) recommend flexibility in analyzing data in order to maintain the emergent nature of inquiry.

Interview Protocol

The interview protocol is provided in the appendix. It focused on the talking points listed above. The interview questions provided the focus for dialogue rather than strict adherence to the stated wording of the protocol.

Data-Collection Process

The interviews were conducted in a number of ways. This reflected the concept of *na'auao*, (knowledge synthesizing aspects of mind, heart, and spirit). Different informants expressed their preferences for sharing their knowledge in different ways. Eleven respondents participated in face-to-face interviews, two participated in telephone interviews, and three submitted written responses. A majority of face-to-face interviews took place in the environments where teaching and learning occurred; a Hawaiian agri/aquaculture teaching/learning environment, a coastal teaching/learning environment, a residence, and a *hālau* (authentic Hawaiian learning center) within a Department of Education high school. Although telephone interviews were not the preferred mode of communication, geographic factors and time constraints made this a necessity. Written responses were followed with either face-to-face interactions or telephone interviews for clarification of information. The remaining interviews were conducted at the Nā Pua No'eau office. All interview data were then transcribed in preparation for analysis.

Analysis

After each interview was conducted, the responses to each interview question were transcribed. When all interviews were completed, the answers given for each of the talking points were analyzed. Categories of responses were defined by common themes arising from discussion on each talking point. That is, categories of responses were defined by frequently mentioned concepts. The following categories and definitions were extracted from the data.

Ke A'o Hawai'i (Critical Elements for Hawaiian Learning)

- **Hawaiians Ways of Learning**

Experience-based learning—Learning activities incorporate hands-on, multi-sensory, multiple intelligence content and contexts.

Authentic learning environments—Learning environments utilize real-life purpose, context, and function in activities that exemplify relevance to students, thematic coherence, and integrated curriculum concepts.

Individual knowledge base—Learning depends on and acknowledges the learner's unique knowledge base, identity, and stage of receptivity.

- **Significance of Relevant Ways of Learning**

Preservation of Hawaiian learning perspective—Traditional ways of knowing and learning are preserved where students are encouraged to replicate knowledge acquired firstly, then are encouraged to solidify understanding by teaching others in authentic learning environments.

Life skills—Learning focuses on skills important to survival and success in social, personal, and cultural well-being of the learner within the context of community.

Personal relevance—Learning relates to a multitude of aspects of daily life ranging from health to personal and community issues critical to the quality of life resulting from decisions and choices made by the learner.

- **Program Design Process**

Community based—Program design begins with the belief that learning is grounded in the learner's community and physical environment. Learning utilizes real-life purpose, context, and function.

Culturally based—Learning activities are taught by practitioners of the culture. Program design emphasizes cultural identity and immerses learners in traditional practices.

Conventional program development—Learning activities are based on the typical processes of program development including needs assessment, goals, vision and mission statements, curriculum, instruction, assessment, and evaluation.

- **Curriculum Focus**

Hawaiian culture—Content focus is grounded in traditional cultural knowledge and teaching strategies including reciprocal teaching and learning, proper protocol, Hawaiian values, identity, spirituality, aspirations, and language.

Authentic relevant content—Curriculum is embedded in real-life purpose, context and function that serves to assist in development of activities characterized by relevance to students, thematic coherence, and integrated curriculum concepts.

- **Instructional Strategies**

Authentic learning environment—Learning environments utilize real-life purpose, context, and function in activities that exemplify relevance to students, thematic coherence and integrated curriculum concepts.

Ke A'o Hawai'i—Learning and teaching in a traditional context utilize the appropriate practices of direct replication of content learned.

- **Appropriate Assessment**

Performance based—Within an authentic environment, learners exhibit what has been learned through observation of performances that demonstrate development and change.

Ongoing assessment—A continual process follows a coherent developmental sequence.

Student self-assessment—A self-assessment process incorporates debriefing, focused reflection, portfolios, and journals.

Criteria—An assessment process utilizes checklists, assignments, rubrics, goals, and mastery standards.

Responses for each of the questions were then coded according to the categories and counted. These results are shown in Table 1.

Results

The first and most general question asked how Hawaiians learn. In general, comments were linked to the Hawaiian context and perspective. The need for experience-based learning activities was mentioned by 75% of the respondents. The need for learning to occur in authentic environments was noted by 68% of the respondents. Slightly more than half of the respondents mentioned the need to build on students' prior knowledge. These results are shown in Questionnaire Talking Point 1 of Table 1.

Talking Point 2 shows the distribution of responses when the informants were asked about why it was important to consider these significant factors. Respondents focused on the need to preserve and acknowledge Hawaiian ways of knowing. They described uniquely Hawaiian ways of structuring knowledge as well as the importance of relating learning to students' real life experiences. The need for learning to connect to real, long-term outcomes was stressed.

Informants varied in their approach to program design. This may have been a function of their experiences with previous programs and their responsibilities in those programs. Approaches included the importance of community-based program development and partnerships and Hawaiian culture as a foundation. Another approach was to use conventional aspects of program development beginning with mission and vision statements and identification of objectives, goals, and activities. Responses seemed to relate to personal style and connections to communities.

There was a great deal of agreement on the focus of curriculum with 75% mentioning that the ideal focus would be grounded in a Hawaiian cultural environment. Talking Point 5 shows responses relating to instructional strategies for Hawaiian students. Actual implementation of curriculum

TABLE 1

Results of Analysis of Responses From Hawaiian Educator Interviews

Questionnaire talking point	Category	n=16	%
1. Hawaiian ways of learning	Experience based	12	75
	Authentic learning environment	11	68
	Individual knowledge base	9	56
	Other categories	< 7	
2. Significance of relevant ways of learning	Preservation of Hawaiian learning perspective	7	44
	Life skills	6	38
	Personal relevance	3	19
	Other categories	< 3	
3. Program design process	Community based	6	38
	Culturally based	5	31
	Conventional program development	5	31
	Other categories	< 5	
4. Curriculum focus	Hawaiian culture	15	93
	Authentic content	9	56
	Other categories	< 3	
5. Instructional strategies	Authentic environment	11	69
	<i>Ke A'o Hawai'i</i>	7	44
	Other categories	< 3	
6. Appropriate assessment	Performance based	11	69
	Ongoing assessment	4	25
	Student self-assessment	4	25
	Criteria	4	25
	Other categories	< 3	

would include authentic learning experiences and approach learning in traditional ways. The strategy *Ke A'o Hawai'i* includes observing and listening coupled with performance and opportunities to practice. Talking Point 6 refers to respondents' views on assessment of learning. Assessment of learning within this type of curriculum would rely heavily on performance-based assessment.

Conclusions

The purpose of the study was accomplished with the identification of two critical factors for native Hawaiian education. The themes of authentic environments and experience-based learning are clearly evident throughout the responses from Hawaiian educators. A clear consensus was obtained about curriculum focus, instructional features, and assessment for supporting Native Hawaiian learners. Programs must exist within the Hawaiian context and must capitalize on cultural ways of learning, knowing,

and making sense of the world. Activities must be grounded in authentic Hawaiian environments and must be experience based. It leads to the conclusion that learning experiences grounded in authentic environments will focus on cultural knowledge specifically tied to individual communities and locations. Each learning community then must define the specific application of these principles within the context of their authentic setting. This approach is consistent with the concepts of Hawaiian epistemology (Meyer, 1998), ways of knowing and the *Kumu Hōnua Maoli Ola* (Akana, Kauhipaula, Kamanā, Kanahele, Kawai'ae'a, Ka'awa, Kimura, Silva, & Wilson, 1998), a philosophical foundation of the Hawaiian Language Immersion program which acknowledges the physical and spiritual reality of Hawaiian life. The consistent thread in the responses was to the cultural traditions that prevail across diverse Hawaiian communities. Those traditions reside in the protocols, artifacts, and wisdom of the elders and are accessible through community resources. The findings are consistent with the need to address the mismatch between home and school environments (Jordan & Tharp, 1979; Erickson & Mohatt, 1982; Phillips, 1992) and the need to view learning as situated (Greeno, Collins, & Resnick, 1996).

The methods we used in this study allowed informants to provide responses that are grounded in their lives, values, and relationship to their culture, the community and environment. Hawaiian ways of knowing determined by the specific knowledge base of each community and place were clearly evident. The results lead to the conclusion that educational programs must be context dependent. Hawaiian educational programs especially need to be developed and implemented within the communities of the learners.

Limitations

While this study provides insight into characteristics of appropriate learning for Native Hawaiians from the perspective of a group of successful Hawaiian educators, some limitations are evident. The pool of informants was located on the Big Island of Hawai'i, rather than a statewide pool; thus, the interpretation of results for the general population of Hawaiian students may be questioned. Also, survey data reflect perspectives, ideas, thoughts, and a cluster of features to be studied further in actual learning activities. These findings need to be researched further to determine what and how these concepts unfold in interactions among teachers, students, and the environment of Hawai'i. The talking point related to program development and resources and program goals did not yield usable results. That question of goals and purposes and methods of developing programs needs to be explored further. Perhaps the misalignment of home and school values and the Hawaiian and Western purposes for education need to be the singular focus of a separate study.

Future Work

The next phase of this research will focus on the documentation of these principles in classrooms with Native Hawaiian students. This work will be conducted in part to substantiate the findings of the survey data, that authentic environments and experience-based learning are indeed supportive of Native Hawaiian students' learning. After the documentation of these features is completed, guidelines for curriculum-development and professional-development components will be designed. Logically, a third stage would be to study the application of the curriculum guidelines and professional-development training to determine applicability of the critical features in the real world of educational settings.

Ua ao Hawai'i ke 'ōlino nei mālamalama.

Hawai'i is enlightened, for the brightness of day is here. [Hawai'i is in an era of education.] (Puku'i, 1983, #2773 p. 305).

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Appendix

Nā Pua No'ēau Curriculum Development Project 1998 Educator Interview

Name _____

Current Position _____

Grade Levels Taught at NPN or elsewhere _____

Subject Areas/Topics Taught _____

Previous Experiences with Nā Pua No'ēau:

What do you believe are the critical factors to providing learning opportunities for Native Hawaiian students to succeed in the areas you teach?

Why do you believe those factors are necessary?

If you were to design a program of study for Native Hawaiian students in your area of study, how would you go about doing that?

What are some of the people, books, or resources you would use to identify goals for student learning?

What would be your primary goals for student learning?

What would be your curriculum focus?

What instructional strategies would you use?

What are ways you would assess how much they learned in your program?

Would you be interested in participating in a project to design curriculum for Native Hawaiian students?

If yes, when is the best time to contact you? Phone number? E-mail?

Authors

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Department of Defense Connected Students in Hawai'i Schools: Relative Risk of Violence

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We investigated the relative risk of violence among students attending Hawai'i public schools with higher proportions of children of Department of Defense (DoD) personnel. At the time of the study, 8 high schools, 8 intermediate or middle schools, and 32 elementary schools enrolled about 95% of the military dependents and nearly 80% of all federal dependents in Hawai'i public schools. Data were analyzed and means compared to statewide averages for school years 1996–97, 1997–98, and 1998–99 on variables related to risks for disorder and violence. The most salient risk factor for disorder and violence for DoD-connected students, and for most students in Hawai'i, is large school size. On most other measures, the schools with high percentages of DoD dependents compared favorably with statewide averages for comparable schools.¹

The large military presence in Hawai'i has considerable impact on the state's economy and its public schools, which the Department of Defense (DoD) trusts to provide a safe and appropriate education for its employees' children. Because of concern about the schools, particularly within the military community, there is a need for studies focusing on the safety and quality of education for DoD dependents in Hawai'i. This study was undertaken to determine the relative risk of violence among students attending Hawai'i public schools with higher proportions of children of Department of Defense personnel.

Background

According to figures from the Hawai'i State Department of Business Economic Development & Tourism (DBEDT), in 1998, federal defense spending in Hawai'i totaled \$4.1 billion, nearly half of the \$8.4 billion total federal expenditures in the state and a considerable amount relative to the \$34.9 billion gross state product. The U.S. Pacific Command (USPACOM) has its headquarters on the island of O'ahu, and all the military services are represented among more than a dozen bases located in the islands. In 1998, military personnel and dependents numbered over 100,000 of the state's one-million-plus population.

To help offset the costs to the state of educating the additional students, in Hawai'i because of their federal connections, the Hawai'i Department of Education (HIDOE) receives federal impact aid. The state documented over 26,000 federal dependents and over 4,000 other federally connected students enrolled in public schools during the 1997-98 school year. The federal dependents included military dependents as well as children of civilian employees of the DoD and other federal government agencies.

At other locations in the Pacific where considerable numbers of Department of Defense dependents live, the DoD runs its own schools through the Department of Defense Education Activity (DoDEA). There are 43 DoDEA schools located in four districts in the Pacific Area. In Japan, Korea, and Okinawa, 39 Department of Defense Dependents Schools (DoDDS) serve about 24,000 students; in the U.S. Territory of Guam, four Domestic Dependents Elementary and Secondary Schools (DDESS) serve about 2,500 students. In Hawai'i, the Department of Defense depends on the state to provide a safe and quality education for its employees' children.

Within the DoD community, however, there has long been concern about the safety and quality of public education in Hawai'i. This negative view is now so widespread in the military services that mid-career officers with school-age children are citing the schools as a reason for declining assignments to Hawai'i, even though the move would benefit their military careers, and the military needs their services in the Pacific theater. This has made the safety and quality of schooling for military dependents a readiness issue within the USPACOM (W. Newman, personal communication,

December 1, 2000). Evidence, in part, of this concern is the growing popularity of home schooling among military families in Hawai'i, supported by several chapters of the Military Home Educators Network (MHEN) and the availability on military bases in Hawai'i of special gymnastics and other sports classes specifically for home-schooled students. In her study of home schooling, Koehlmoos (2000) found the practice prevalent within the military community in Hawai'i and prompted, in part, by concern about school violence.²

Because of the apparently growing concern, there is a need for studies focusing on the safety and quality of education for DoD dependents in Hawai'i. This study was undertaken to determine the relative risk of violence among students attending Hawai'i public schools with higher proportions of children of Department of Defense personnel.

School Violence and the Hawai'i Department of Education

Overall, schools in Hawai'i are relatively safe places. Statewide indicators, such as the Youth Risk Behavior Surveys (YRBS) administered biennially in Hawai'i schools since 1991, show that Hawai'i students rank low compared to other states in the frequency of injury and violence behaviors, such as weapon carrying and physical fighting (Saka & Lai, 1998). However, these data also reveal that, in comparison to national results, higher percentages of Hawai'i students perceive their schools as unsafe. And there have been incidents of school violence in Hawai'i.

One of the most disturbing records of recent campus violence in Hawai'i belongs to a very large high school in a community west of Honolulu that serves a rapidly growing mixed population of local residents and military families. The school suspended 25 students after a 2 February 2000 brawl at the school that resulted in the hospitalization of two students (Gonser, 2000). Several parents kept their children out of school over safety concerns surrounding this incident and others. During the previous year, the school suffered the theft of \$50,000 worth of new computers as well as the injury of 13 students in January 1999 from the explosion of a homemade "sparkler bomb" in a stairwell; three students were arrested for the latter. The president of the school's Parent Teacher Student Association (PTSA) told the newspaper that parents consider school safety a higher priority even than curriculum. In response to concerns, the school hired more security guards and brought in off-duty police officers. In mid-February 2000, the school principal announced formation of a task force of teachers, "military families, parents and students" (p. A23) to look for ways to prevent campus violence in the future.

In 1999 many were shocked when an eighth-grader on Maui was hospitalized after a vicious beating by four classmates at an intermediate school (Gordon, 1999). According to his mother, her son had been the target of teasing and unprovoked attacks before the beating incident (Keesing,

1999). She and over 100 others who gathered at a PTSA meeting were very vocal about their belief that the school was a dangerous place; she felt the school officials had not taken the incident seriously enough (Gordon, 1999). Three weeks after the attack, *The Honolulu Advertiser* ran a story on bullying in the schools, wherein it was reported that Hawai'i educators said it is "time to stop sweeping the issue under the carpet as something that is 'just part of growing up'" (Keesing, 1999, p. A27). The article included statistics on harassment incidents that are reported by schools to the Hawai'i Department of Education and described a "troubling new trend" here—court-issued temporary restraining orders to prevent students from approaching or contacting other students. The HIDOE reported plans to provide training in February 2000 to a group of teachers who could then lead workshops for other teachers on "bully-proofing" schools. The HIDOE has also produced a video on bullying to be distributed to all middle and high schools as soon as funding allows, and its definition of harassment will now include the word "bully."

The HIDOE is taking steps to deal with violence in Hawai'i schools. Reported along with the sometimes sensationalized news of violent incidents is ample evidence that the HIDOE is trying to deal with, not ignore, the problem. The reaction by the HIDOE may be typically low key, in keeping with the local culture, but it is also limited by funding during a time when the state has been suffering from a long-term economic downturn. Still, the Department has been taking steps to deal with conflicts on the public school campuses. They were forced to look very seriously at diversity education by a series of headline-grabbing incidents in 1997, '98, and '99 involving African American students being mocked or harassed for their race (Anwar, 1999). The news article described formal diversity programs at intermediate and high schools on Maui and the Big Island (Island of Hawai'i). Kevin Shollenberger, Hawai'i regional director of the National Coalition Building Institute, who was overseeing those programs for the HIDOE, was described as saying that one of the challenges was "breaking through Hawai'i's veneer of interracial aloha" (p. A3). Because of this, many believe that racism is not a problem in Hawai'i. The Department of Education acknowledges otherwise and is actively looking for "a solid diversity curriculum" to institutionalize tolerance, not just "do a one-shot deal" (p. A3).

The HIDOE has taken other steps toward improving the safety of school campuses. About two years ago, the HIDOE joined with the Hawai'i Association of Independent Schools, the Hawai'i Catholic Schools, and members of the Honolulu Police Department and the State Legislature to form the Hawai'i Schools Safety Consortium. This effort to bring the three school systems—public, private, and parochial—into accord on school-safety issues has succeeded in opening lines of communication, sponsoring presentations and workshops on teasing and bullying, adopting the

Children's Peace Camp Hawai'i, and introducing a number of bills for consideration by the State Legislature.

The HIDOE also sought and won federal funds to help improve school safety. In September 1999, the Central school district was awarded an anti-violence grant of \$1.8 million per year for 3 years for social services and community police work (Blakeman, 1999). In March 2000, State Schools Superintendent Paul LeMahieu announced the expenditure of part of those funds for placing retired law enforcement officers in 12 public high schools as "school safety managers" (Masuoka, 2000, p. A1), saying, "The issue of safety on campus is a pressing concern." Officers for 11 middle schools were planned for the following year. These are serious efforts aimed at the prevention of school violence and the re-establishment of a sense of safety at school. Such efforts are needed and would be well informed by the identification of groups and schools most at risk for violence and most in need of preventive measures.

Focus of the Present Study

That returns us to the focus of the present study—the relative risk of violence among students attending Hawai'i schools with higher proportions of children of DoD personnel, both military and civilian.

The prominent presence of the military in Hawai'i results in a large, distinct group of students who may or may not be differentially at risk for school violence (perpetration, victimization, and anti-social behavior in general). There are education liaisons from each branch of the military services to help with communication and problem solving within the school community that serves both the widely diverse resident population of the State of Hawai'i and the more transient military community. More recently, the establishment of the Joint Venture Education Forum, consisting of 16 military officers and state educators and cochaired by the superintendent of schools and an Air Force officer from the U.S. Pacific Command, highlights the military's concerns about education in Hawai'i as well as the HIDOE's commitment to resolve those issues (Gordon, 2000).

To the Department's credit, the HIDOE does not as a rule single out this subgroup of military dependents; they are fully integrated into the public schools. Consider also that the DoD-connected students in Hawai'i consist of more than just dependents of military personnel. They also include dependents of the large contingent of civilian federal employees of the DoD, many of them members of the local community, born and raised in the Islands and life-long residents.

To determine the relative risk to DoD-connected students for this study, it was necessary first to characterize them and locate them within the public school system, then to examine those schools most populated by them in comparison to other public schools in the state.

Method

Data Sources and Analyses

Data used for this report included three successive years of school-level data from the HIDOE: 1996–97, 1997–98, and 1998–99. The most recent complete set of data was for school year 1997–98. Those data were used for characterizing the DoD-connected student population, locating them in the public school system, and exploring possible relationships between the proportions of federal dependents in a school and the rates of various offenses that led to suspensions in that school.

Offense data available by school included the number of each of 24 different offenses associated with suspensions reported by that school for a given school year. The 24 offenses were aggregated into six general categories as indicated in the following list.

- **Violent offenses**
assault, extortion, robbery, sexual offenses, terroristic threatening
- **Property offenses**
property damage, burglary, theft
- **Weapons offenses**
dangerous weapons, firearms
- **Drug offenses**
marijuana, alcohol, smoking, illicit substances, sale of illicit substances, drug paraphernalia
- **Department offenses**
disorderly conduct, harassment, insubordination
- **Other offenses**
gambling, trespassing, false alarm, contraband, other school rule offenses

Scatter plots were created and correlation coefficients calculated among the following variables: the percentage of enrollment federally connected (military, nonmilitary, and total, excluding low-rent housing recipients) by school, the offense rate per 100 students for each of the six categories of offenses reported by school, and school size.

To help locate DoD-connected students within the school system, all regular public schools in Hawai'i in 1997–98 were ranked twice, once by percentage of enrollment federally connected and again by percentage of enrollment connected to the military only. Those high schools (H), intermediate/middle schools (I/M), and elementary schools (E) that ranked high on both lists were further examined. For each of those schools identified, an individual school profile was created featuring school-level background information and suspension-related offense data along with district and state averages on those same variables for comparable schools for three successive school years.³

Limitations of the Databases

A few comments are in order here about the limitations of the original databases and cautions about their use.

Federally Connected Pupils Database

The federally connected pupils database is compiled annually by the HIDOE to determine the amount of impact aid owed to the Hawai'i school system by the federal government. Students whose parents live, work, or live and work on federal property or live in federally subsidized low-rent housing are categorized and counted. The complete database available for this report has two parts: federally connected pupils by school and employing agency excluding low-rent housing recipients and the low-rent housing pupils by school and employing agency. For the majority of this report, only the first part of the database was used. The low-rent housing pupils included only four military dependents, so they were excluded from the analyses as not being representative of DoD-connected students.

In the database, pupils are classified using six categories of parental employment: five military (Air Force, Army, Navy/Marine Corps, Coast Guard, and National Guard) and one nonmilitary. The five military categories are obviously DoD-connected students. The nonmilitary category includes the many students whose parents are DoD-connected civilian employees, but it also includes students whose parents are connected with other federal departments and agencies operating in Hawai'i (e.g., the FBI, USDA, FAA, Customs Service, Immigration). The nonmilitary federally connected pupils are, therefore, not all DoD-connected. A percentage of those who are DoD-connected can be estimated by using employment figures from the Hawai'i State Department of Business Economic Development & Tourism (DBEDT). By DBEDT figures, in 1998 there were 30,400 federal government jobs in Hawai'i and 16,050 civilian employees of the Air Force, Army, and Navy in Hawai'i that year. By these figures, 53% of the nonmilitary federal jobs in 1998 were held by DoD civilian personnel, so we estimate that slightly over half of the nonmilitary federal dependents were DoD connected. In this study, the analyses were generally done for three separate groups: military dependents only, nonmilitary dependents only, and all federal dependents (excludes low-rent housing pupils).⁴

Offenses Leading to Suspensions Database

The offense data show great variability from school to school that seems to indicate as much variability in the schools' recording and reporting of offenses as in the actual occurrences of offenses. This is especially true at the elementary school level and with the reporting of offenses in the categories of *deportment* and *other*, which do not usually involve breaking of laws and police reports. There are also data missing from this HIDOE database, especially from elementary schools, indicating that some schools did not

submit reports, perhaps because they had no suspensions that year or submitted them too late. Another caveat regarding the offense data is this: the offenses recorded are only those associated with suspensions in the schools. They are, then, only a gross measure of school disorder, reflecting behaviors that collectively resulted in only the extreme consequence of suspension. Most students who are suspended are charged with a number of offenses, so the raw data do not fairly reflect the number of students involved either. There are also repeat offenders, so that even the number of suspensions is not the same as the number of different students suspended. For the analyses here, we use offense rates, the number of offenses that lead to suspensions per 100 students enrolled. Caution is advised in using the data to make school-to-school comparisons: they are more useful and valid for comparing a single school to itself over time.

Despite the limitations of the original databases and cautions about their use, they can still be valuable to help identify possible relationships and warn of potential trouble areas where preventive measures might be applied with good effect.

Results

Distribution of Federally Connected Students in Hawai'i Public Schools

Data collected in 1997–98 show federally connected students (including low-rent housing pupils) enrolled in 229 of the 246 regular public schools open then (93%). Percent enrollment per school ranged from over 100% (an artifact of the different times the data were collected) to 0% for 17 neighbor island schools not listed in the HIDOE federally connected pupils database that year (see Figure 1).

When the low-rent housing pupils are removed from the analysis, 219 of 246 schools (89%) have federally connected students enrolled. The rest of the analyses in this report exclude the 4,284 nonmilitary and 4 military low-rent housing pupils counted as federally connected pupils in 1997–98. The term *federal dependents* is used to describe the group that excludes low-rent housing pupils; it includes military and nonmilitary dependents and is estimated to be over 80% DoD-connected.

In school year 1997–98, federal dependents made up over 14% of student enrollment, well over 26,000 of the approximately 189,000 public school students, nearly two thirds of those military dependents (over 16,000). Table 1 gives the breakdown by district for military and nonmilitary federal dependents in terms of actual numbers as well as percentage of enrollment. Table 2 locates them in the schools.

If we estimate, based on state employment figures, that 53% of non-military dependents are DoD-connected, then 21,990 ($16,716 + (.53)(9,952)$) or 82% of the 26,668 federal dependents in Table 1 are DoD connected, and

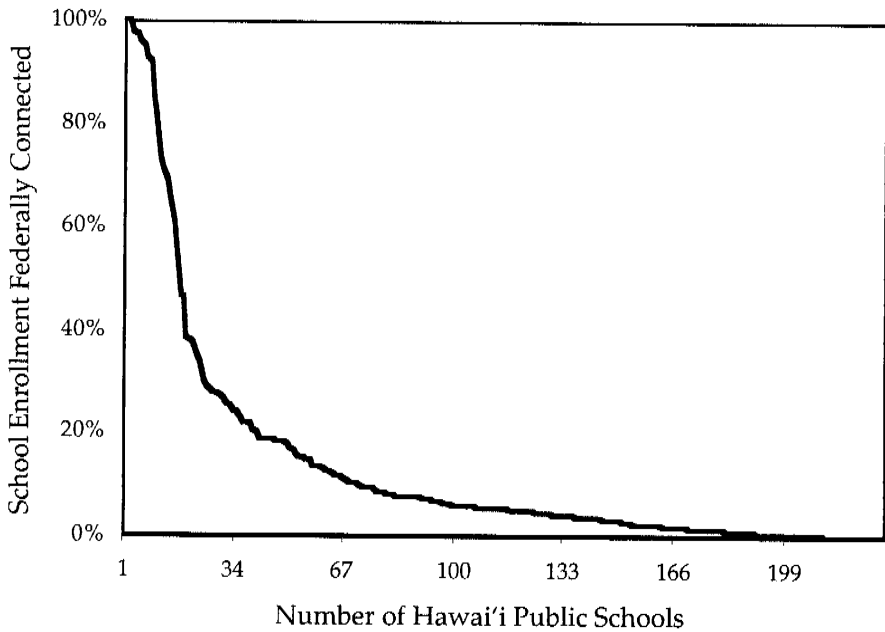


FIGURE 1. Distribution of federally connected pupils in Hawai'i public schools as a percentage of enrollment per school (includes low-rent housing pupils).

approximately 12% of the Hawai'i public school enrollment is DoD connected. The largest impact by federal dependents in 1997–98 was on the Central district.

Schools with Higher Proportions of Federally Connected Pupils

In Table 3 are listed in order the schools with the highest percentages of military dependents in school year 1997–98. The schools in Table 3 were further analyzed using data related to school climate and risk for violence and disorder.

Measures of Risk for Disorder and Violence

From the HIDOE data for the three successive school years, several variables were selected as possible indicators of risk for disorder and violence. Mean percentages and rates were calculated for each of the three school years for the schools in Table 3. These means were compared to state means for the same variables each year. Results are presented in Tables 4, 5, and 6.

TABLE 1

Numbers and Percentages of Federally Connected Pupils by Hawai'i Public School District for School Year 1997-98 (Excludes Low-Rent Housing)

District	Official September Enrollment	# Military % Military	# Federally connected nonmilitary % Federally connected nonmilitary	# Total federally connected % Total federally connected
Central	35,538	11,699 10.3%	32.9% 15,374	3,675 43.3%
Leeward	37,071	3,447 9.1%	9.3% 6,837	3,390 18.4%
Windward	19,980	1,275 5.2%	6.4% 2,309	1,034 11.6%
Honolulu	35,354	164 3.5%	0.5% 1,417	1,253 4.0%
Kaua'i	11,039	66 3.3%	0.6% 426	360 3.9%
Hawai'i	28,506	48 0.7%	0.2% 255	207 0.9%
Maui	21,712	17 0.2%	0.1% 50	33 0.2%
Statewide Totals	189,200	16,716 5.3%	8.8% 26,668	9,952 14.1%

TABLE 2

Number of Schools With Federal Dependents by Type and Location for School Year 1997-98

Type of School	Number of schools with federal dependents (Number of schools without federal dependents) by district							Total
	Central	Leeward	Windward	Honolulu	Kaua'i	Maui	Hawai'i	
Elementary (E)	29	29	23	38 (2)	10	10 (8)	14 (5)	153 (15)
Elementary and intermediate (E/I)			1				3 (3)	4 (3)
Intermediate (I)	5	4	2			3 (2)	2 (1)	16 (3)
Middle (M)				9	1		(1)	10 (1)
Intermediate and high (H/I)	1	1	1		2	(1)	3	8 (1)
Elementary and high (H/E)					(1)	1 (1)	2	3 (2)
High (H)	5	4	3	6	1	3 (1)	3 (1)	25 (2)

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TABLE 3

Hawai'i Public Schools With the Greatest Proportion of Department of Defense Connected Students Enrolled During School Year 1997–98 Listed in Order of Percentage of Military Dependents

High schools (H) with over 15% total federal dependents and from 63% to 4% ^a military dependents (district)	Intermediate/Middle (I/M) schools with over 15% total federal dependents and from 57% to 2% ^b military dependents (district)	Elementary schools (E) with over 25% federal dependents and from 100% to 6% ^c military dependents (district)
Radford (Central)	Āliamanu Inter (Central)	Solomon (Central)
Leilehua (Central)	Wahiawā Inter (Central)	Hale Kula (Central)
Kalāheo (Windward)	Moanalua Inter (Central)	Mokulele (Central)
Moanalua (Central)	ʻIlima Inter (Leeward)	Nimitz (Central)
Campbell (Leeward)	Wheeler Inter (Central)	Pearl Harbor Kai (Central)
Mililani (Central)	Kailua Inter (Windward)	Hickam (Central)
Pearl City (Leeward)	Highlands Inter (Leeward)	Shafter (Central)
ʻAiea (Central)	ʻAiea Inter (Central)	Iroquois Point (Leeward)
		Barbers Point (Leeward)
		Mōkapu (Windward)
		Wheeler (Central)
		Lehua (Leeward)
		Āliamanu (Central)
		Red Hill (Central)
		Makalapa (Central)
		Pearl Harbor (Central)
		Helemano (Central)
		Webbing (Central)
		Pearl City (Leeward)
		Moanalua (Central)
		Wahiawā (Central)
		Mililani-Uka (Central)
		Mauka Lani (Leeward)
		Mililani-Waena (Central)
		Scott (Central)
		Kekaha (Kauaʻi)
		ʻAikahi (Windward)
		Holomua (Leeward)
		Kipapa (Central)
		Kaleiʻōpuʻu (Leeward)
		Pearl Ridge (Central)
		Mililani-Mauka (Central)

^aThese 8 high schools enrolled 96% of all military dependents in Hawai'i public high schools in 97–98. ^bThese 8 intermediate/middle schools enrolled 96% of all military dependents in Hawai'i public intermediate and middle schools in 97–98. ^cThese 32 elementary schools enrolled 94% of military dependents in Hawai'i public elementary schools in 97–98.

High School Results

In Table 4 the results for high schools show that the average enrollment of the eight high schools with the highest proportions of DoD-connected students exceeded the state mean high school enrollment by over 100 students for each of the 3 years. On other risk factors, these schools compare favorably in each case with state averages. On the Effective Schools Survey items dealing with home-school relations and learning climate at the school, there are mixed results.

With one notable exception, offense rates at high-DoD-percentage schools were generally below and a few times at the state means. The exception was drug offenses. Five of the eight high-DoD-percentage schools exceeded the state average drug offense rate last year; four of those five exceeded the state average in 1996–97 and one of those in 1997–98 as well. The most frequent drug offense involved in suspensions at these schools was cigarette smoking.

Intermediate and Middle School Results

Results of the analysis of risk for disorder and violence for intermediate schools with high proportions of DoD dependents are in Table 5. Results mirror those for the high schools. They all compare favorably with the state averages, generally showing lower risk for and indications of disorder and violence than the average Hawai'i intermediate school (Grades 7–8). High-DoD-percentage intermediate schools had a larger average enrollment (by about 50 students) than the state average for intermediate schools. Unlike the mixed results for the high schools, the intermediate schools had results consistently below state averages on the Effective Schools Survey items.

In terms of the rate of offenses leading to suspensions in high-DoD-percentage intermediate schools, these schools generally showed rates below and a few times at the state average, however, with a wide range.

Elementary School Results

Table 6 lists results of the analysis for the 32 elementary schools with the highest proportion of DoD dependents. Like the high schools and intermediate schools, the elementary schools had a substantially larger average enrollment (by over 130 students each year) than the state average for elementary schools. They had lower percentages of students receiving free or reduced-price lunch and of limited English proficiency (SLEP), and they had higher average daily attendance than the statewide averages. Although lower than the state average of about 45%, the 35% average of percentage of enrollment receiving free or reduced-price lunch at the high-DoD-percentage elementary schools indicates some risk associated with low socio-economic status (SES) on these campuses. On the Effective Schools Survey, the high-DoD-percentage elementary school students' responses mirrored the statewide responses.

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TABLE 4

Mean Percentages and Rates on Measures of Risk for Disorder and Violence for Eight Public High Schools With the Highest Proportions of DoD-connected Students Compared to State Means for SY 96–97, 97–98, and 98–99

		DoD-connected schools		Comparable public schools (Grades 9–12)	
		Low to high	Mean	Low to high	Mean
Measures of risk for disorder					
Background					
Number of comparable schools	1996–97	8		26	
	1997–98	8		28	
	1998–99	8		28	
September enrollment	1996–97	1180–2285	1794	701–2379	1689
	1997–98	1220–2210	1806	402–2431	1644
	1998–99	1222–2314	1791	779–2500	1645
Percentage of enrollment receiving free/reduced lunch	1996–97	7.1–22.7%	14.2%	5.5–45.0%	21.7%
	1997–98	8.2–27.5%	15.9%	6.8–42.0%	24.0%
	1998–99	8.2–27.1%	16.3%	6.9–50.8%	26.0%
Percentage of enrollment with limited English proficiency (SLEP)	1996–97	1.6–8.1%	4.8%	1.0–20.4%	6.3%
	1997–98	1.9–7.2%	4.4%	1.5–21.5%	6.1%
	1998–99	1.6–9.1%	5.8%	1.6–25.4%	7.9%
Percentage federal dependents	1997–98	18.9–71.1%	32.2%	0–71.1%	13.3% a
Military dependents	1997–98	3.6–62.7%	19.2%	0–62.7%	5.7% a
Nonmilitary dependents	1997–98	6.0–23.3%	11.7%	0–23.3%	7.6% a
Average daily attendance	1996–97	86.5–95.0%	92.2%	80.1–97.3%	90.6%
	1997–98	86.4–96.0%	92.4%	71.7–98.0%	90.5%
	1998–99	87.4–95.7%	92.0%	86.5–98.1%	90.9%
Graduation/completion rate	1996–97	92.3–98.8%	96.5%	87.5–99.4%	94.9%
	1997–98	91.8–98.6%	96.5%	84.6–100%	95.8%
	1998–99	95.0–100%	97.1%	85.2–100%	95.2%
Effective Schools Survey: % of positive student responses to home-school relations items ^b	1996–97	31.0–35.0% (5)	32.0%	22.0–35.0%	30.0%
	1997–98	22.4–26.6% (2)	24.5%	20.4–40.0%	28.3%
Effective Schools Survey: % of positive student responses to learning-climate items ^b	1996–97	28.0–35.0% (5)	31.0%	25.0–45.0%	31.9%
	1997–98	17.8–24.7% (2)	21.3%	17.8–42.4%	29.0%

^aState means include low-rent housing pupils and are thus overestimates of the actual state mean percentages of federal dependents in schools. ^bThe Effective Schools Survey was conducted on a rotating schedule, approximately every three or four years at any given school. Numbers in parentheses indicate the number of schools in the calculation.

TABLE 4 (continued)
Mean Percentages and Rates on Measures of Risk for Disorder and Violence for Eight Public High Schools With the Highest Proportions of DoD-connected Students Compared to State Means for SY 96-97, 97-98, and 98-99

		DoD-connected schools		Comparable public schools (Grades 9–12)	
Measures of risk for disorder	Year	Low to high	Mean	Low to high	Mean
Offenses resulting in suspensions					
Rate of violent offenses ^c	1996–97	0.5–2.4	1.1	0.1–3.0	1.3
	1997–98	0.3–3.3	1.2	0.2–4.1	1.3
	1998–99	0.1–1.3	0.8	0.1–2.4	0.8
Rate of property offenses ^c	1996–97	0.1–0.6	0.3	0.0–1.6	0.5
	1997–98	0.2–0.4	0.3	0.1–1.5	0.6
	1998–99	0.0–0.7	0.3	0.0–1.2	0.4
Rate of weapons offenses ^c	1996–97	0.1–0.4	0.2	0.0–0.5	0.2
	1997–98	0–0.8	0.3	0.0–1.2	0.3
	1998–99	0.1–0.4	0.2	0.0–0.5	0.2
Rate of drug offenses ^c	1996–97	2.3–9.9	5.4	1.0–17.7	5.7
	1997–98	1.4–9.7	4.3	1.1–17.4	5.2
	1998–99	1.7–7.2	4.4	0.3–13.2	4.1
Rate of deportment offenses ^c	1996–97	5.9–14.9	10.9	2.7–43.9	14.4
	1997–98	4.9–14.1	9.5	2.4–42.0	12.9
	1998–99	2.7–17.0	9.5	0.7–30.4	9.8
Rate of other offenses ^c	1996–97	0.2–8.9	2.9	0.1–12.4	3.8
	1997–98	0.4–6.6	2.1	0.1–10.1	2.5
	1998–99	0.2–3.2	1.6	0.1–6.6	1.9

^cRate is the number of offenses per 100 students enrolled. A rate of 2.1 means the school has slightly more than 2 offenses per 100 students.

The average rates of offenses leading to suspensions in all categories were low for these schools, with 6 schools reporting no offenses leading to suspensions. One school, however, had 53 suspensions. In general, though, the offense data do not indicate a greater risk for disorder and violence among the DoD-connected students in these schools relative to the rest of Hawai'i's public elementary schools.

Correlation Analyses

Pearson product-moment correlation coefficients were calculated among the following variables using data for school year 1997-98: the percentage of enrollment that was federal dependents (military, nonmilitary, and total) by school, the offense rate per 100 students for each of the six categories of offenses reported by school, and school size.

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TABLE 5

Mean Percentages and Rates on Measures of Risk for Disorder and Violence for Eight Intermediate and Middle Schools With the Highest Proportions of DoD-connected Students Compared to State Means for SY 96–97, 97–98, and 98–99

		DoD-connected schools		Comparable public schools (Grades 7–8)	
	Year	Low to high	Mean	Low to high	Mean
Background					
Number of comparable schools	1996–97	8		13	
	1997–98	8		13	
	1998–99	8		13	
September enrollment	1996–97	759–1322	1008	225–1322	957
	1997–98	719–1412	1012	227–1412	958
	1998–99	653–1416	986	229–1416	931
Percentage of enrollment receiving free/reduced lunch	1996–97	14.5–44.8%	24.8%	14.5–68.2%	34.2%
	1997–98	15.7–50.3%	27.4%	15.7–65.3%	35.8%
	1998–99	18.8–47.6%	28.5%	18.8–74.1%	37.6%
Percentage of enrollment with limited English proficiency (SLEP)	1996–97	1.5–6.6%	4.1%	1.0–14.7%	4.8%
	1997–98	1.7–7.8%	4.7%	1.3–15.0%	5.2%
	1998–99	2.5–11.3%	6.3%	1.6–20.7%	6.6%
Percentage federal dependents	1997–98	15.4–61.0%	33.4%	0–71.1%	26.0% a
Military dependents	1997–98	3.1–57.1%	22.6%	0–62.7%	15.4% a
Nonmilitary dependents	1997–98	3.8–20.5%	10.7%	0–23.3%	10.6% a
Average daily attendance	1996–97	92.3–95.9%	94.2%	87.5–95.9%	93.5%
	1997–98	92.2–96.2%	94.5%	89.9–96.2%	93.8%
	1998–99	92.4–96.1%	94.2%	91.7–96.1%	93.8%
Effective Schools Survey: % of positive student responses to home-school relations items ^b	1996–97	24.0–37.0% (5)	29.8%	24.0–39.0%	31.7%
	1997–98	26.5–34.9% (2)	30.7%	26.5–40.3%	35.3%
Effective Schools Survey: % of positive student responses to learning-climate items ^b	1996–97	21.0–30.0% (5)	22.2%	15.0–48.0%	27.3%
	1997–98	23.5–24.3%	23.9%	23.5–34.4%	28.1%

^aUnlike the other percentages in this category, the state means include low-rent housing pupils and are thus overestimates of the actual state mean percentages of federal dependents in schools. ^bThe Effective Schools Survey is conducted on a rotating schedule, approximately every three or four years at any given school. Numbers in parentheses indicate the number of schools in the calculation.

TABLE 5 (continued)
Mean Percentages and Rates on Measures of Risk for Disorder and Violence for Eight Intermediate and Middle Schools With the Highest Proportions of DoD-connected Students Compared to State Means for SY 96–97, 97–98, and 98–99

		DoD-connected schools		Comparable public schools (Grades 7–8)	
		Low to high	Mean	Low to high	Mean
Measures of risk for disorder					
Offenses resulting in suspensions					
Rate of violent offenses ^c	1996–97	0.3–3.6	1.8	0.3–3.8	1.8
	1997–98	0.4–4.6	1.7	0.4–4.6	1.5
	1998–99	0.1–2.7	1.6	0.0–4.1	1.7
Rate of property offenses ^c	1996–97	0.5–3.4	2.3	0.5–3.6	2.3
	1997–98	0.6–1.5	1.2	0.6–4.4	1.4
	1998–99	0.0–3.5	1.4	0.0–3.5	1.5
Rate of weapons offenses ^c	1996–97	0.0–1.2	0.7	0.0–1.2	0.5
	1997–98	0.0–1.3	0.5	0.0–2.0	0.6
	1998–99	0.1–0.9	0.5	0.0–1.0	0.5
Rate of drug offenses ^c	1996–97	0.4–3.6	2.2	0.0–4.2	2.4
	1997–98	1.5–3.4	2.0	1.5–6.7	3.0
	1998–99	0.4–2.9	1.7	0.4–4.3	2.3
Rate of deportment offenses ^c	1996–97	2.8–22.6	12.1	2.8–53.5	17.4
	1997–98	5.9–19.2	10.5	5.9–31.4	15.1
	1998–99	4.6–21.4	10.9	4.6–27.0	14.6
Rate of other offenses ^c	1996–97	0.5–9.5	4.3	0.0–29.4	6.3
	1997–98	0.3–17.4	4.8	0.3–17.4	5.6
	1998–99	0.7–11.7	3.9	0.7–11.7	3.6

^cRate is the number of offenses per 100 students enrolled. A rate of 2.1 means the school has slightly more than 2 offenses per 100 students.

None of the correlations between percentage of federal dependents enrolled in a school and each of the six offense rates by school reached statistical significance at conventional levels ($p < .05$). (see Table 7).

The correlation coefficients between school size and proportion of federal dependents are in Table 8. Hawai'i's schools are large. At the high school level (Grades 9–12) in 1997–98, the 27 schools included in this analysis ranged in size from 402 to 2,431 students, with a mean size of 1,659 and a median size of 1,793. By most measures nearly all of Hawai'i's high schools are big schools: only 3 of 27 high schools had fewer than 1,000 students. The range for the 28 intermediate and middle schools in this study was 482 to 1,412 students, with a mean size of 897 and a median of 946. Again, these are

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TABLE 6

Mean Percentages and Rates on Measures of Risk for Disorder and Violence for 32 Elementary Schools With the Highest Proportions of DoD-connected Students Compared to State Means for SY 96–97, 97–98, and 98–99

Measures of risk for disorder	Year	DoD-connected schools		Comparable public schools (Grades K-6)	
		Low to high	Mean	Low to high	Mean
Background					
Number of comparable schools	1996-97	32		127	
	1997-98	32		126	
	1998-99	32		126	
September enrollment	1996-97	346-1268	749	90-1621	607
	1997-98	340-1257	757	90-1628	603
	1998-99	311-1074	724	83-1489	591
Percentage of enrollment receiving free/reduced lunch	1996-97	4.7-64.2%	35.0%	3.0-87.3%	44.2%
	1997-98	3.7-77.0%	34.9%	3.7-94.3%	45.3%
	1998-99	3.9-70.2%	35.8%	3.9-89.5%	46.3%
Percentage of enrollment with limited English proficiency (SLEP)	1996-97	0.7-17.3%	4.6%	0-27.5%	5.9%
	1997-98	0.5-20.6%	4.9%	0-23.9%	5.7%
	1998-99	0.8-22.3%	7.3%	0-33.7%	8.2%
Percentage federal dependents	1997-98	17.2-104.8% ^b	54.4%	0.3-104.8% ^b	20.8% ^a
Military dependents	1997-98	5.7-103.9% ^b	46.7%	0.0-103.9% ^b	13.2% ^a
Nonmilitary dependents	1997-98	0.2-20.1%	7.8%	0.2-40.6%	7.6% ^a
Average daily attendance	1996-97	94.3-96.9%	95.5%	89.4-97.1%	94.4%
	1997-98	92.0-96.6%	95.5%	87.5-97.0%	94.5%
	1998-99	92.6-96.6%	95.6%	90.9-97.0%	94.8%
Effective Schools Survey: % of positive student responses to home-school relations items ^c	1996-97	48.0-81.0% (22)	64.0%	48.0-85.0%	64.5%
	1997-98	56.0-72.0% (8)	64.0%	53.1-81.5%	65.9%
Effective Schools Survey: % of positive student responses to learning-climate items ^c	1996-97	35.0-81.0% (22)	53.0%	35.0-81.0%	56.6%
	1997-98	44.4-72.4% (8)	59.8%	44.4-90.8%	64.1%

^aUnlike the other percentages in this category, the state means include low-rent housing pupils and are thus overestimates of the actual state mean percentages of federal dependents in schools. ^bThe percentages exceeding 100% are an artifact of counting enrollment and federally connected students at different times of the year. ^cThe Effective Schools Survey is conducted on a rotating schedule, approximately every three or four years at any given school. Numbers in parentheses indicate the number of schools in the calculation.

TABLE 6 (continued)

Mean Percentages and Rates on Measures of Risk for Disorder and Violence for 32 Elementary Schools With the Highest Proportions of DoD-connected Students Compared to State Means for SY 96–97, 97–98, and 98–99

Measures of risk for disorder	Year	DoD-connected schools		Comparable public schools (Grades K–6)	
		Low to high	Mean	Low to high	Mean
Offenses resulting in suspensions					
Rate of violent offenses ^d	1996–97	0.0–1.6	0.3 ^e	0.0–6.4	0.4
	1997–98	0.0–1.0	0.2 ^f	0.0–10.2	0.3
	1998–99	0.0–1.1	0.2 ^g	0.0–11.4	0.3
Rate of property offenses ^d	1996–97	0.0–0.7	0.2 ^e	0.0–3.4	0.2
	1997–98	0.0–0.7	0.1 ^f	0.0–4.2	0.2
	1998–99	0.0–1.8	0.2 ^g	0.0–3.2	0.2
Rate of weapons offenses ^d	1996–97	0.0–0.4	0.1 ^e	0.0–0.5	0.1
	1997–98	0.0–0.5	0.0 ^f	0.0–2.1	0.1
	1998–99	0.0–0.3	0.0 ^g	0.0–0.4	0.0
Rate of drug offenses ^d	1996–97	0.0–0.3	0.0 ^e	0.0–7.9	0.2
	1997–98	0.0–0.6	0.0 ^f	0.0–0.8	0.0
	1998–99	0.0–0.3	0.0 ^g	0.0–1.0	0.0
Rate of deportment offenses ^d	1996–97	0.0–7.0	1.6 ^e	0.0–51.4	2.7
	1997–98	0.0–6.6	0.0 ^f	0.0–46.9	2.1
	1998–99	0.0–7.2	1.3 ^g	0.0–42.7	2.1
Rate of other offenses ^d	1996–97	0.0–1.5	0.0 ^e	0.0–5.8	0.4
	1997–98	0.0–1.3	0.2 ^f	0.0–3.4	0.2
	1998–99	0.0–0.7	0.1 ^g	0.0–1.9	0.2

^dRate is the number of offenses per 100 students enrolled. A rate of 2.1 means the school has slightly more than 2 offenses per 100 students. ^eMissing offense data for some of the 32 elementary schools: *n* = 27. ^f*n* = 31. ^g*n* = 25.

big schools. Of the 159 elementary schools analyzed, 10 had enrollments over 1,000 in 1997–98 (the highest 1,628); of these 10, 5 of them were among the 32 elementary schools with the highest percentages of military dependents. The correlations shown in Table 8 are attenuated by the fact that nearly all Hawai'i's students attend large schools. The "Quality Counts 2000" report by *Education Week* (available online at <http://edweek.org/>) shows that in 1998 in Hawai'i only 5% of high school students attended high schools with 900 or fewer students. Only 9% of middle school students attended middle schools of 600 or fewer, and just 6% of elementary students went to elementary schools of 350 or fewer students in Hawai'i.

Department of Defense Connected Students in Hawai'i Schools

TABLE 7

Pearson Product-Moment Correlation Coefficients Between Percentages of Federal Dependents Enrolled and School Offense Rates^a for Each of Six Categories of Offenses

Federal dependents	Violent offenses rate <i>r</i>	Property offenses rate <i>r</i>	Weapons offenses rate <i>r</i>	Drug offenses rate <i>r</i>	Department offenses rate <i>r</i>	Other offenses rate <i>r</i>
Elementary (E) <i>N</i> = 113 ^b						
% Military only	-.018	-.160	-.035	-.054	-.092	-.146
% Nonmilitary only	-.010	-.022	-.075	-.061	-.096	-.063
% All federal dependents	-.020	-.164	-.048	-.065	-.109	-.158
Intermediate/Middle (I/M) <i>N</i> = 27 ^c						
% Military only	-.108	+.046	+.075	-.082	+.114	+.027
% Nonmilitary only	+.236	+.203	-.133	+.014	+.143	+.077
% All federal dependents	-.016	+.104	+.022	-.065	+.142	+.047
High Schools (H) <i>N</i> = 26 ^d						
% Military only	-.142	-.095	+.253	-.274	+.167	-.063
% Nonmilitary only	+.246	-.154	-.064	+.003	+.322	+.241
% All federal dependents	-.026	-.137	+.186	-.227	+.260	+.038

Note. None of the correlations reached statistical significance at the conventional .05 level.

^aOffense rates are number of offenses per 100 students enrolled at a school. ^bElementary schools missing offense data = 46 (missing data could indicate no suspensions at the school or late submission of data). ^cIntermediate/middle schools missing offense data = 1. ^dHigh schools missing offense data = 1.

TABLE 8

Pearson Product-Moment Correlation Coefficients Between Percentages of Federal Dependents Enrolled in a School and School Size

School Level	% Military only <i>r</i>	% Nonmilitary only <i>r</i>	% All federal dependents <i>r</i>
Elementary (E) <i>N</i> = 159	+.236**	-.159*	+.265***
Intermediate (I) & Middle (M) <i>N</i> = 28	+.245	+.326	+.312
High (H) <i>N</i> = 27	-.007	+.320	+.115
All Schools (E, I, H, H/I, H/E, E/I) <i>N</i> = 229	+.044	+.172**	+.080

p* < .05. *p* < .01. ****p* < .001.

Discussion

School Size

The most salient risk factor for disorder and violence for DoD-connected students in Hawai'i schools is associated with school size. Defining "large" schools as those enrolling 750 or more students, Hawai'i has nearly the highest proportion of large schools in the country. A 1992 HIDEOE study (Educational Assessment and Accountability System [EAAS]) showed that only Florida had a higher percentage of large schools than Hawai'i's 39%. Comparison to three states with similar total enrollments at that time—Rhode Island, Nevada, and New Hampshire—showed Hawai'i with substantially more large schools than their 15%, 22%, and 8%, respectively. Well-designed research on school size spanning 20 years has shown that at the elementary level smaller schools have a positive effect on student achievement, attendance, satisfaction, and extracurricular participation (Fowler, 1992). Research at the secondary school level is more recent and investigated effects on various student outcomes including achievement, educational attainment, attendance, dropout rates, student satisfaction, sense of belonging, adolescent loneliness, substance use and abuse, and extracurricular participation. Typical outcomes have shown that after the factors of district SES and percentage of students from low-income families, school size was the next most consistent factor related to outcomes—and the relationship was negative (EAAS, 1992). Although results of studies on the effects of school size on achievement have been mixed in the secondary level research, the studies appear to be in full agreement that smaller schools have positive effects on student attitudes, satisfaction, attendance, and extracurricular participation (Fowler, 1992). The HIDEOE study on Hawai'i public schools found the following.

Larger schools do not produce better student outcomes. To the contrary, we found that *smaller* public secondary schools in Hawai'i had relatively smaller proportions of students failing HSTEC, smaller proportions of students retained in grade, higher attendance rates (grade 10 but not grade 8 schools), and more positive perceptions of the school's climate for learning among both students and parents. . . . We also found that larger schools, both elementary and secondary, had relatively more incidents and higher costs of school property crimes (burglaries, thefts, and vandalism) than did smaller schools. (EAAS, 1992, p. 26)

In *Education Week* magazine's annual rating of state school systems (available online at <http://edweek.org/>) called "Quality Counts 2000," school sizes used as "cut-offs" for their data presentation for school climate were 900 students for high schools, 600 students for middle schools, and 350

students for elementary schools. Hawai'i had fewer than 10% of students in schools with enrollments below these thresholds. The average size of Hawai'i high schools is over 1,600 students (nearly twice the "Quality Counts 2000" size); for intermediate schools (Grades 7–8), it is over 900 and for elementary schools, over 700. The average size of schools with the highest percentages of DoD-connected dependents exceeded these state averages at every level: by 100 students at high school, by about 50 students at intermediate, and by over 130 students at the elementary level. There is a significant positive correlation between the percentage of military dependents in elementary schools in Hawai'i and school size. DoD-connected students in Hawai'i generally attend very large, urban schools and are thus subject to the risks that accompany large school size.

Other Measures of Risk

In general, the Hawai'i schools with the highest proportions of DoD-connected students had lower percentages of students receiving free or reduced-price lunches, lower percentages of students with limited English proficiency, higher graduation/completion rates, and better attendance than the state averages for comparable schools. Of note, however, is that although the percentage of students receiving free or reduced-price lunch was lower than the state average at all levels, at the elementary level the high-DoD-percentage schools ranged from 4–70% and averaged 35%, and at the intermediate level they ranged from 15–50% and averaged over 25% of enrollment on free or reduced-price lunch. This indicates some risk associated with low socio-economic status at these campuses.

Effective Schools Survey

The results of student responses to the Effective Schools Survey items on home-school relations and learning climate were consistent with what might be predicted based on the research about school size. Students at the high schools and the intermediate schools with the highest percentages of DoD-connected students had a lower opinion of their schools' home-school relations and learning climates than did students statewide. Elementary students at high-DoD-percentage schools responded positively at the same rate as the state average on home-school relations but responded less positively about their schools' learning climates than students did statewide.

Offenses Leading to Suspensions

Comparisons of offense rates for the high-DoD-percentage schools with comparable schools showed that, with one exception, at all levels and for all categories of offenses the average offense rates at the schools were below or at the state averages for comparable schools. The exception was for drug offenses, and most of those involved smoking cigarettes. The higher suspension rate for smoking at these particular high schools may indicate a

bigger problem with smoking there than at the average public high school in Hawai'i, or it may mean there was more vigorous enforcement of the no-smoking rules at these schools. In general, the offense data do not indicate a greater risk for disorder and violence among the DoD-connected public school students relative to the rest of Hawai'i's public school students.

Although the average offense rates for these schools compared favorably with the state averages, the ranges of offense rates were generally larger at the intermediate level. This may indicate more variation in the levels of disorder and violence in the high-DoD-percentage intermediate schools than in the high schools or elementary schools with high percentages of DoD-connected students.

Conclusion

Department of Defense connected students in Hawai'i attend some of the largest public schools in the state, with the average enrollment at elementary, intermediate, and high schools well exceeding the already high state averages for those levels. They are thus at risk for the kinds of disruptions and negative effects that generally accompany large school size. In spite of that, however, the risk of violence among Department of Defense connected students in Hawai'i schools appears to be no greater than, and in some ways is less than, that for other students in the public schools in Hawai'i.

Notes

¹ This article is based on a larger study completed in March 2000 and conducted by the authors as part of the Hawai'i Informed Prevention System, a project funded by the U.S. Department of Education Safe and Drug-Free Schools Program, and with support from The George Washington University Hamilton Fish National Institute on School and Community Violence. The original study was produced by the University of Hawai'i Curriculum Research & Development Group, and an excerpt from this article received the Hawai'i Educational Research Association's 2001 Distinguished Paper Award.

² Estimates of how many students are home schooled in Hawai'i range from the Hawai'i Department of Education's low figure of 2,523, based on the number who have registered with their local public school as required by law, to high figures of from 6,000 to 9,000, the estimate of the National Home Education Research Institute (NHERI) based on local membership in home schooling organizations, circulation of related publications, census data, and other figures NHERI uses. A recent study based on interviews with home schooling mothers indicates that the practice is prevalent within the military community in Hawai'i and is prompted in part by concerns about school violence (Koehlmoos, 2000).

³ These individual school profiles with comparable district and state means, minima, and maxima were developed by the Hawai'i Informed Prevention System (HIPS) at the University of Hawai'i Curriculum Research & Development Group as part of a federal project funded by the U.S. Department of Education Safe and Drug-Free Schools Program.

⁴ There is some evidence that this database undercounts military dependents in Hawai'i public schools. A recent newspaper article stated that "there are 28,000 military children in Hawai'i's public schools" (Gordon, 2000, p. A5). A recent communication with a HIDEOE statistician produced a figure less than that but more than the figure of 16,716 indicated in the HIDEOE database used for this report. The authors are working to resolve these apparent inconsistencies.

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**Assessing Youth Risk Behaviors and School-Based
Prevention Programs in Health Education:
Results from the Hawai'i Youth
Risk Behavior Survey and the Hawai'i
School Health Education Profile Survey**

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This paper compares results from the 1999 Hawai'i High School, Hawai'i Middle School, and United States Youth Risk Behavior Surveys (YRBS) and the 2000 Hawai'i School Health Education Profile Survey (SHEP). Hawai'i youth demonstrate lower levels of health-risk behaviors when compared with U.S. youth overall. However, Hawai'i YRBS data specify important areas of concern, such as perceptions of unsafe schools, suicide-related behaviors, alcohol and marijuana use on school property, availability of illegal drugs on school property, marijuana use before age 13, and unprotected sexual intercourse. SHEP results indicate that Hawai'i middle, junior high, and senior high schools are attempting to address health-risk behaviors in school health education classes. However, assignment of unprepared teachers to teach required health education courses and limited opportunity for professional development in health education impair the ability of Hawai'i schools to meet statewide expectations for the recently released Hawai'i Health Content and Performance Standards.

Today's adolescents struggle with difficult decisions about health-risk behaviors related to injury and violence, alcohol and other drugs, sexual health, tobacco, dietary behaviors, and physical inactivity, which are linked to the leading causes of death among young people and adults. The greatest mortality among youth ages 10–24 results from motor-vehicle crashes, other unintentional injuries, homicide, and suicide, all resulting from behaviors related to injury and violence. Considerable morbidity and social problems also result from alcohol and other drug use, unintended pregnancy, and sexually transmitted disease, including HIV infection. The leading causes of death among U.S. adults are cardiovascular disease and cancer, linked to tobacco use, poor dietary habits, and sedentary lifestyles (Kann, Kinchen, Williams, Ross, Lowry, Grunbaum, Kolbe, & State and Local YRBSS Coordinators, 2000).

The health-risk behaviors that contribute to premature morbidity, mortality, and social problems often are established during youth, extend into adulthood, and, most importantly, are preventable (Kann et al., 2000). To assess the status of health-risk behaviors among youth and related school-based prevention programs in health education, the Centers for Disease Control and Prevention (CDC) assists state and local education agencies (SEAs/LEAs) in implementing the Youth Risk Behavior Survey (YRBS) and the School Health Education Profile Survey (SHEP). The Curriculum Research & Development Group (CRDG), University of Hawai'i at Mānoa, has conducted the YRBS for the Hawai'i Department of Education (DOE) in odd-numbered years since 1991 to monitor priority health-risk behaviors among secondary school students. The SHEP has been conducted in even-numbered years since 1994 to monitor characteristics of health education programs in middle or junior high schools and senior high schools.

The purpose of this article is to compare results from the most recent surveys for which data are available, the 1999 Hawai'i and United States YRBS and the 2000 Hawai'i SHEP. We examine the extent to which Hawai'i middle and high school students place themselves at risk for serious health problems, compare Hawai'i youth risk behaviors with behaviors of youth across the U.S., and assess school-based prevention programs in health education in Hawai'i secondary schools.

Method

Youth Risk Behavior Survey

The YRBS comprises questions in six categories of priority health-risk behaviors among adolescents: behaviors that contribute to unintentional and intentional injuries; alcohol and other drug use; sexual behaviors that contribute to unintended pregnancy and sexually transmitted disease (STD), including HIV infection, tobacco use, unhealthy dietary behaviors, and physical inactivity (Kann et al., 2000). CDC conducts the YRBS in odd-

numbered years among nationally representative samples of high school students. CDC also provides fiscal and technical assistance to SEAs and LEAs to conduct local surveys. The Hawai'i Department of Education has contracted with CRDG to conduct the YRBS among representative samples of high school students in Grades 9–12 in odd-numbered years since 1991. CRDG also conducted a middle school YRBS among representative samples of students in Grades 6–8 in 1997 and 1999.

The multiple-choice Hawai'i YRBS questionnaire was administered to 1,248 public school students in Grades 9–12 and 1,394 public school students in Grades 6–8 during spring 1999. Survey administration, conducted in selected classrooms by trained data collectors, was designed to protect the privacy and confidentiality of all participants. Student participation was voluntary, with written parental permission required. Sampling and survey administration procedures have been reported previously (Saka & Lai, 2000).

School Health Education Profile Survey

The SHEP is used to monitor characteristics of health education programs in middle or junior high and senior high schools (Grunbaum, Kann, Williams, Kinchen, Collins, Baumler, Kolbe, & State and Local Health Education Profiles Coordinators, 2000). Two SHEP questionnaires were developed by CDC in collaboration with representatives of state, local, and territorial education agencies. CDC provides fiscal and technical assistance to SEAs/LEAs to conduct the survey in even-numbered years.

The SHEP includes two questionnaires, one for school principals and one for teachers who are designated as the school's "lead health education teacher" by the principal. Questionnaires were mailed to all regular secondary Hawai'i public schools, containing any of Grades 6 through 12. Sampling and administration procedures have been described previously (Grunbaum et al., 2000).

Results

Youth Risk Behavior Survey

Results from the Hawai'i Middle School and High School YRBS were statistically weighted and can be used to identify risk behaviors generalizable to all Hawai'i public school students in Grades 6–8 and 9–12. Weighting procedures have been reported previously (Saka & Lai, 2000). Table 1 includes selected response percentages for representative samples of students in Hawai'i middle schools, Hawai'i high schools, and U.S. high schools. Table 1 also provides the relative rank of Hawai'i high school frequencies compared to those of other states with weighted data.

TABLE 1

1999 Youth Risk Behavior Survey: Hawai'i Middle School^a, Hawai'i High School^b, and U.S. High School^c

Injury and Violence Behaviors	Hawai'i middle school (MS) %	Hawai'i high school (HS) %	Hawai'i high school ranking ^d	U.S. high school %
1. Rarely or never wore a seat belt when riding in a car driven by someone else	12.2 (+2.3)	10.6 (+2.5) ^e	1/22	16.4 (+2.8)
2. Motorcycle riders who rarely/never wore helmet, past 12 months	NA ^f	64.5 (+7.4)	20/20	38.0 (+5.4)
3. Bicycle riders who rarely/never wore helmet, past 12 months	65.0 (+4.0)	89.5 (+5.0)	10/22	85.3 (+3.7)
4. Rarely or never wore a helmet when rollerblading or skateboarding	54.2 (+3.5)	NA	NA	NA
5. Injured while playing sports or being physically active, required medical treatment, past 12 months	NA	38.6 (+2.5)	11/17	37.3 (+2.3)
6. Rode with a driver who had been drinking alcohol, past 30 days	27.2 (+3.0)	38.3 (+5.0)	17/22	33.1 (+2.4)
7. Drove after drinking alcohol, past 30 days	NA	14.5 (+3.4)	11/22	13.1 (+1.2)
8. Carried a weapon, such as a gun, knife, or club, past 30 days	20.1 (+1.9)	13.7 (+2.8)	1/20	17.3 (+2.0)
9. Carried a gun, past 30 days	8.9 (+2.3)	4.2 (+1.5)	2/20	4.9 (+1.2)
10. 30-day incidence of weapon carrying (per 100 students)	NA	48.6	1/20	70.8 (+13.4)
11. In physical fight, past 12 months	39.0 (+3.8)	30.6 (+4.6)	5/22	35.7 (+2.4)
12. Injured in a physical fight and required medical attention, past 12 months	4.4 (+1.3)	3.0 (+1.3)	4/22	4.0 (+0.7)
13. Been hit, slapped, or physically hurt by boyfriend or girlfriend on purpose, past 12 months	7.1 (+2.0)	7.9 (+1.5)	2/19	8.8 (+1.5)
14. Would probably walk away or talk their way out of a fight	34.0 (+2.8)	NA	NA	NA
15. 12-month incidence of physical fighting (per 100 students)	NA	90.1	2/22	105.9 (+14.2)
16. Ever forced to have sexual intercourse	6.0 (+1.5)	8.3 (+1.6)	3/18	8.8 (+0.9)
17. Felt unsafe at school or on way to or from school, past 30 days	41.8 (+3.2)	NA	NA	NA
18. Felt too unsafe to go to school, past 30 days	4.3 (+0.9)	11.4 (+8.0)	22/22	5.2 (+1.3)
19. Carried a weapon on school property, past 30 days	6.0 (+1.6)	6.0 (+1.7)	3/22	6.9 (+1.2)

Past 30 days

^aHawai'i middle school, grades 6–8, *n* = 1,394. ^bHawai'i high school, grades 9–12, *n* = 1,248. ^cU.S. high school, grades 9–12, *n* = 15,349. ^dHawai'i high school ranking compared to states with weighted data. Lower rankings are better except for two items: *trying to lose weight* and *ate less food to lose weight or control weight gain*, where it is not clear which direction is better. ^eNinety-five percent confidence interval.

^fNA = Not available.

Assessing Youth Risk Behaviors and School-Based Prevention Programs

TABLE 1 (continued)

1999 Youth Risk Behavior Survey: Hawai'i Middle School, Hawai'i High School, and U.S. High School

Injury and Violence Behaviors (continued)	Hawai'i middle school (MS) %	Hawai'i high school (HS) %	Hawai'i high school ranking	U.S. high school %
20. Threatened or injured with a weapon on school property, past 12 months	NA	6.7 (±2.1)	2/22	7.7 (±0.8)
21. In physical fight on school property, past 12 months	20.3 (±3.4)	11.5 (±2.2)	5/22	14.2 (±1.3)
22. Had property stolen or deliberately damaged on school property, past 12 months	58.2 (±3.4)	NA		NA
23. Felt sad or hopeless almost every day for >2 weeks in a row, past 12 months	NA	31.8 (±3.4)	21/21	28.3 (±1.2)
24. Seriously considered attempting suicide, past 12 months	30.0 (±4.0)	23.3 (±2.2)	21/21	19.3 (±1.2)
25. Made a suicide plan, past 12 months	In lifetime 14.8 (±2.3)	18.5 (±2.4)	21/21	14.5 (±1.4)
26. Attempted suicide, past 12 months	In lifetime 11.1 (±1.6)	10.1 (±1.6)	22/22	8.3 (±0.9)
27. Made suicide attempt requiring medical attention, past 12 months	In lifetime 4.6 (±1.4)	3.7 (±1.2)	21/22	2.6 (±0.5)
Tobacco Use Behaviors				
28. Ever tried cigarette smoking	41.5 (±5.0)	67.2 (±2.2)	2/20	70.4 (±3.0)
29. Smoked ≥1 cigarettes for 30 consecutive days	NA	19.8 (±1.9)	2/20	25.3 (±2.6)
30. Smoked cigarettes, past 30 days	12.3 (±2.4)	27.9 (±2.3)	2/22	34.8 (±2.5)
31. Smoked ≥2 cigarettes on days smoked, past 30 days	5.1 (±0.8)	18.6 (±2.0)	NA	NA
32. Smoked cigarettes on ≥20 days, past 30 days	NA	13.1 (±2.1)	2/21	16.8 (±2.5)
33. Smoked ≥10 cigarettes per day on days smoked, past 30 days	NA	2.6	2/22	5.2 (±1.2)
34. Ever tried to quit smoking cigarettes	20.9 (±3.0)	37.8 (±3.3)	NA	NA
35. Used chewing tobacco or snuff, past 30 days	2.5 (±0.9)	2.2 (±0.6)	1/22	7.8 (±2.2)
36. Smoked cigars, cigarillos, or little cigars, past 30 days	5.3 (±1.9)	7.8 (±1.6)	2/21	17.7 (±1.7)
37. Smoked cigarettes or cigars or used chewing tobacco or snuff, past 30 days	NA	29.9	2/21	40.2 (±2.8)
38. Got cigarettes by buying in a store or gas station, past 30 days	NA	6.2 (±1.3)	NA	NA
39. Current smokers, <18 years of age who bought cigarettes at a store or gas station, past 30 days	NA	14.1 (±4.1)	7/21	23.5 (±4.5)

TABLE 1 (continued)

1999 Youth Risk Behavior Survey: Hawai'i Middle School, Hawai'i High School, and U.S. High School

Tobacco Use Behaviors (continued)	Hawai'i middle school (MS) %	Hawai'i high school (HS) %	Hawai'i high school ranking	U.S. high school %
40. When buying cigarettes in a store, not asked for proof of age, past 30 days	NA	NA	NA	69.6 (±5.7)
41. Asked to show proof of age when buying cigarettes in a store, past 30 days	1.0 (±0.7)	NA	NA	NA
42. First smoked a whole cigarette before age 13	4.3 (±1.6)	27.1 (±4.7)	13/22	24.7 (±1.9)
43. Smoked cigarettes on school property, past 30 days	4.9 (±1.3)	12.0 (±1.8)	5/22	14.0 (±1.9)
44. Used chewing tobacco or snuff on school property, past 30 days	NA	1.6 (±0.6)	2.5/20	4.2 (±1.8)
Alcohol and Other Drug Use Behaviors				
45. Ever drank alcohol	NA	76.4 (±2.8)	3.5/19	81.0 (±2.0)
46. Drank alcohol, past 30 days	19.7 (±2.8)	44.6 (±4.5)	3/22	50.0 (±2.5)
47. Had ≥5 drinks of alcohol on ≥1 occasion, past 30 days	8.0 (±2.4)	26.8 (±3.6)	4/22	31.5 (±1.9)
48. First tried alcohol before age 13	16.1 (±1.7)	33.6 (±3.5)	17.5/22	32.2 (±2.4)
49. Drank alcohol on school property, past 30 days	NA	7.7 (±1.9)	22/22	4.9 (±0.7)
50. Ever used marijuana	NA	44.6 (±3.7)	8.5/20	47.2 (±2.6)
51. Used marijuana, past 30 days	9.1 (±2.4)	24.7 (±3.1)	11/22	26.7 (±2.5)
52. First tried marijuana before age 13	2.0 (±0.8)	14.8 (±3.1)	20/22	11.3 (±1.8)
53. Used marijuana on school property, past 30 days	3.4 (±1.2)	9.3 (±2.3)	21/22	7.2 (±1.4)
54. Ever used cocaine (e.g., powder, crack, or freebase)	2.3 (±0.9)	7.8 (±1.4)	7.5/21	9.5 (±1.3)
55. Used cocaine, past 30 days	NA	3.3 (±1.2)	7.5/21	4.0 (±0.7)
56. First tried cocaine before age 9	0.4 (±0.4)	NA	NA	NA
57. Ever sniffed glue or inhaled intoxicating substances	18.4 (±3.0)	12.9 (±1.6)	5/21	14.6 (±1.7)
58. Sniffed glue or inhaled intoxicating substances, past 30 days	NA	3.9 (±1.1)	6/21	4.2 (±0.8)
59. Ever used heroin (e.g., smack, junk, or China White)	NA	2.3 (±1.2)	4/21	2.4 (±0.6)

Assessing Youth Risk Behaviors and School-Based Prevention Programs

TABLE 1 (continued)

1999 Youth Risk Behavior Survey: Hawai'i Middle School, Hawai'i High School, and U.S. High School

Alcohol and Other Drug Use Behaviors (continued)	Hawai'i middle school (MS) %	Hawai'i high school (HS) %	Hawai'i high school ranking	U.S. high school %
60. Ever used methamphetamines (e.g., speed, crystal, crank, or ice)	3.2 (±1.2)	7.7 (±2.1)	5/22	9.1 (±1.1)
61. Ever used illegal steroids	2.6 (±1.2)	2.5 (±1.2)	1.5/22	3.7 (±0.7)
62. Ever injected illegal drugs (drugs not prescribed by physician)	1.8 (±0.6)	1.6 (±1.0)	1/21	1.8 (±0.4)
63. Ever used LSD, PCP, ecstasy, or mushrooms	4.1 (±1.6)	NA	NA	NA
64. Ever used sedatives or downers without a doctor's prescription	4.3 (±1.5)	NA	NA	NA
65. Were offered, sold, or given an illegal drug on school property, past 12 months	24.9 (±3.4)	36.3 (±4.3)	22/22	30.2 (±2.4)
66. Would probably walk away or talk their way out of it if offered an illegal drug on school property	72.4 (±2.3)	NA	NA	NA
Sexual Behaviors				
67. Ever had sexual intercourse	14.1 (±2.5)	41.0 (±1.9)	1/18	49.9 (±4.0)
68. Had first sexual intercourse before age 13	8.3 (±1.7)	6.8 (±1.9)	9.5/20	8.3 (±1.3)
69. Had four or more sex partners during lifetime	NA	12.2 (±2.5)	5.5/20	16.2 (±2.8)
70. Had sexual intercourse, past 3 months	NA	28.5 (±1.8)	2/19	36.3 (±3.7)
71. Currently abstinent—sexually active students who had no sexual intercourse, past 3 months	NA	30.4 (±3.3)	4/18	27.3 (±2.4)
72. Condom use during last sexual intercourse—currently sexually active students (intercourse during past 3 months)	NA	47.1 (±3.8)	19/19	58.0 (±4.2)
73. Birth control pill use before last sexual intercourse—currently sexually active students (intercourse during past 3 months)	NA	18.1 (±3.4)	12/19	16.2 (±2.6)
74. Alcohol or drug use at last sexual intercourse—currently sexually active students (intercourse during past 3 months)	2.6 (±1.0)	26.8 (±5.6)	9.5/19	24.8 (±3.0)
75. No method used to prevent pregnancy, last intercourse	4.3 (±1.6)	NA	NA	NA
76. Have been pregnant or gotten someone pregnant	NA	5.7 (±1.4)	13/20	6.3 (±1.5)
77. Were taught about HIV / AIDS in school	85.7 (±3.1)	90.6 (±2.6)	9/22	90.6 (±1.5)

TABLE 1 (continued)

1999 Youth Risk Behavior Survey: Hawai'i Middle School, Hawai'i High School, and U.S. High School

Dietary Behaviors	Hawai'i middle school (MS) %	Hawai'i high school (HS) %	Hawai'i high school ranking	U.S. high school %
78. Ate ≥ 5 servings of fruits and vegetables per day, past 7 days	NA	21.1 (± 3.3)	7/18	23.9 (± 1.7)
79. Drank > 3 glasses of milk per day, past 7 days	NA	15.4 (± 1.4)	18/21	18.0 (± 1.7)
80. Ate fruit, yesterday	71.6 (± 1.7)	NA	NA	NA
81. Drank 100% fruit juice, yesterday	57.2 (± 2.7)	NA	NA	NA
82. Drank diet soda, yesterday	21.6 (± 2.1)	NA	NA	NA
83. Drank regular soda, yesterday	67.5 (± 5.4)	NA	NA	NA
84. Ate green salad, yesterday	38.9 (± 2.2)	NA	NA	NA
85. Ate cooked vegetables, yesterday	54.5 (± 2.7)	NA	NA	NA
86. Ate hamburger, hot dogs, or sausage, yesterday	51.8 (± 2.4)	NA	NA	NA
87. Ate french fries or potato chips yesterday	49.9 (± 2.7)	NA	NA	NA
88. Ate cookies, doughnuts, pie, cake, yesterday	51.2 (± 3.3)	NA	NA	NA
89. At risk for becoming overweight—students who were $\geq 85^{\text{th}}$ percentile but $\leq 95^{\text{th}}$ percentile for body mass index by age and sex	NA	16.3	17/21	16.0
90. Overweight—students who were $\geq 95^{\text{th}}$ percentile for body mass index	NA	9.0 (± 1.8)	12/21	9.9 (± 1.2)
91. Described selves as slightly or very overweight	32.9 (± 3.8)	33.5 (± 2.8)	20/22	30.0 (± 0.9)
92. Trying to lose weight	46.7 (± 3.8)	47.1 (± 3.3)	22/22	42.7 (± 1.5)
93. Exercised to lose weight or control weight gain, past 30 days	64.5 (± 3.4)	62.7 (± 2.3)	1/21	58.4 (± 1.8)
94. Ate less food, fewer calories, or foods low in fat to lose weight or control weight gain, past 30 days	38.6 (± 2.7)	40.3 (± 2.4)	6/21	40.4 (± 1.8)
95. Went ≥ 24 hours without eating (fasting) to lose weight or control weight gain, past 30 days	NA	11.8 (± 2.4)	4.5/20	12.6 (± 1.4)
96. Took diet pills, powders, or liquids to lose weight or control weight gain, past 30 days	5.8 (± 1.7)	7.2 (± 1.9)	8/21	7.6 (± 0.7)
97. Took laxatives or vomited to lose weight or control weight gain, past 30 days	5.0 (± 1.2)	4.7 (± 1.9)	6.5/21	4.8 (± 0.6)

Assessing Youth Risk Behaviors and School-Based Prevention Programs

TABLE 1 (continued)

1999 Youth Risk Behavior Survey: Hawai'i Middle School, Hawai'i High School, and U.S. High School

Physical Activity	Hawai'i middle school (MS) %	Hawai'i high school (HS) %	Hawai'i high school ranking	U.S. high school %
98. Exercised vigorously ≥ 20 minutes on ≥ 3 of past 7 days	66.0 (± 2.8)	64.0 (± 4.5)	10/22	64.7 (± 2.2)
99. Exercised moderately ≥ 30 minutes on ≥ 5 of past 7 days	NA	20.3 (± 2.8)	22/22	26.7 (± 1.6)
100. Did strengthening exercises on > 3 of past 7 days	NA	51.1 (± 4.3)	13/20	53.6 (± 2.2)
101. Watched television < 2 hours, average school day	NA	55.3 (± 3.0)	17/20	57.2 (± 3.0)
102. Were enrolled in physical education (PE) class	65.4 (± 6.7)	41.9 (± 7.8)	13/22	56.1 (± 7.2)
103. Attended (were enrolled in) daily PE classes	NA	8.9 (± 3.1)	21/22	29.1 (± 9.4)
104. Enrolled students active in PE class for ≥ 20 minutes	63.5 (± 6.1)	83.8 (± 5.6)	6/20	76.3 (± 3.7)
105. Played on a sports team, past 12 months	≥ 10 minutes 51.1 (± 3.4)	54.6 (± 3.2)	16/22	55.1 (± 2.5)
106. Participated in other physical activities besides sports teams, such as dance, gymnastics, or swimming	40.1 (± 2.3)	NA	NA	NA

Injury and Violence

Hawai'i middle and high school students were more likely to wear seat belts, with Hawai'i ranking best in seat-belt use among states with weighted data. However, Hawai'i was worse in motorcycle-helmet use and similar in bicycle-helmet use, compared to U.S. students overall. More than half of Hawai'i middle school students rarely or never wore a helmet when rollerblading or skateboarding. Hawai'i students were similar to U.S. students in riding with drinking drivers or driving after drinking alcohol.

Hawai'i ranked low (desirable) in weapon carrying and physical fighting on and off school property, compared with states having weighted data, but frequencies were similar to the national mean on some of these behaviors. Hawai'i ranked worst among states with weighted data in percent of students feeling too unsafe to go to school during the past month. In addition, Hawai'i ranked worst in suicide-related behaviors compared to states with weighted data.

Tobacco

Overall, the frequency of tobacco-use behaviors was lower than or similar to that of U.S. students. Hawai'i student use of cigars and smokeless tobacco was significantly less than that among U.S. students.

Alcohol and Other Drugs

The frequency of alcohol and other drug use among Hawai'i students was lower than or similar to overall U.S. alcohol and other drug use in most categories. However, Hawai'i ranked worst in alcohol use on school property among states with weighted data. In addition, Hawai'i students were more likely to try marijuana before age 13. More than one third of Hawai'i high school students and one fourth of middle school students reported being offered, sold, or given an illegal drug on school property during the past year.

Sexual Behavior

Hawai'i middle and high school students generally reported less frequent sexual health-risk behaviors than students across the U.S. Hawai'i students were statistically significantly less likely to have ever had sexual intercourse or to have had intercourse in the past three months. However, sexually active students in Hawai'i reported risk behaviors (e.g., having multiple sexual partners, drinking or using drugs before last intercourse) consistent with those of students across the U.S. Sexually active students in Hawai'i were significantly less likely to use condoms during last intercourse than U.S. students overall.

Dietary Behaviors

Hawai'i students were similar to U.S. students nationally in consumption of fruits and vegetables but were lower in frequency of consumption of milk. Hawai'i and U.S. students were similar in their risk of being, becoming, or perceiving themselves as overweight. However, more Hawai'i students were likely to be attempting weight loss, even if they did not perceive themselves as overweight. Hawai'i students were more likely to exercise to lose or maintain weight than U.S. students overall but were similar in other weight-loss behaviors (e.g., eating less, fasting, taking diet pill or laxatives, vomiting).

Physical Activity

Hawai'i students were similar or less likely than U.S. students overall to have engaged in vigorous or moderate physical activity or strengthening exercises. Hawai'i students were less likely to be enrolled in physical education classes or to attend daily physical education classes. Hawai'i students were similar to U.S. students nationally in their sports team participation.

School Health Education Profile Survey

Usable questionnaires were received from 65 principals and 62 lead health education teachers from the 84 regular secondary public schools in Hawai'i containing any of Grades 6–12. The weighted results can be used to

make inferences about the characteristics of health education in Hawai'i public secondary schools (Centers for Disease Control and Prevention, 2000).

Principal Survey

Results from the principal survey (see Table 2) indicated that all regular public secondary schools in Hawai'i required health education for students at some point in Grades 6–12. Most schools required one health education course. Health education was most often required in Grades 7 and 10. Health education was combined with physical education in 40% of schools and taught mainly in another subject (e.g., science, social studies) in 10% of schools. Schools received mainly positive or no feedback about health education, and very few parents made requests for exemptions.

All schools adopted policies prohibiting tobacco use. Most schools encouraged, but did not require, participation in assistance, education, or cessation programs for students caught using tobacco at school. Students' use of tobacco at school more often resulted in detention, in-school suspension, or suspension from school.

All schools adopted security policies and had closed campuses during the school day. Almost all schools had adult hall monitors, and more than half of schools had police or guards during the school day. Two thirds of schools had peer mediation programs and/or programs to prevent gang violence. Almost all schools had a written plan for responding to violence at school. In comparison, only 60% of schools adopted policies to protect the rights of students and/or staff with HIV infection/AIDS.

Lead Teacher Survey

All lead health education teachers stated that a health education course was required for students in their school (see Table 3). More than half of teachers reported they were required to use the National Health Education Standards, and almost all reported they were required to use state curricula, frameworks, or guidelines.

Most teachers reported trying to increase students' knowledge in the health topics listed in the survey questionnaire. All teachers reported trying to increase students' knowledge in alcohol or other drug use, HIV, STD, and tobacco-use prevention, and 90% or more taught about injury prevention, emotional and mental health, growth and development, human sexuality, physical activity and fitness, pregnancy prevention, and violence prevention.

More than 80% of teachers also reported trying to increase students' skills in alignment with the National and Hawai'i Health Education Standards (Joint Committee on National Health Education Standards, 1995; Hawai'i Department of Education, 1999). In addition, most teachers used interactive teaching methods, such as group discussion, cooperative group activities, role play, and simulations. Approximately two thirds of teachers used the Internet for teaching health education.

TABLE 2
2000 Hawai'i School Health Education Profile Report—School Principal Survey

Item	Overall % <i>n</i> = 65	Middle school % <i>n</i> = 31	Mid/High school % <i>n</i> = 13	High school % <i>n</i> = 21
Schools that required health education for students in any of grades 6–12 in this school	100	100	100	100
School's health education requirement				
• One health education course	72	65	46	100
• Two health education courses	20	23	46	0
• Three health education courses	8	13	8	0
Grades in which health education is required in this school				
• 6 th grade	46	47	40	NA
• 7 th grade	75	90	33	NA
• 8 th grade	32	31	33	NA
• 9 th grade	53	100	62	43
• 10 th grade	67	NA	46	80
• 11 th grade	15	NA	8	19
• 12 th grade	15	NA	8	20
Schools in which ≤5% of students were exempted or excused from required health education by parental request	95	99	85	95
How health education is taught				
• In a combined health education and physical education course	41	53	54	14
• In a course mainly about another subject other than health education, such as science, social studies, or English	10	11	8	10
Schools in which a school administrator or health education teacher coordinates health education	86	90	77	86
Schools that have a school-health advisory group	31	39	15	29
Schools that received mainly positive or no feedback about health education during this school year	91	90	85	96
Schools that adopted a comprehensive policy prohibiting cigarette smoking by students	100	100	100	100
School action when students are caught smoking (always, almost always, or sometimes)				
• Referred to a school counselor	52	72	50	24
• Referred to a school administrator	100	100	100	100
• Encouraged, but not required, to participate in an assistance, education, or cessation program	67	53	84	76
• Required to participate in an assistance, education, or cessation program	20	13	15	34
• Placed in detention	60	67	62	47
• Given in-school suspension	57	57	62	58
• Suspended from school	86	83	92	86
• Parents/guardians are informed	100	100	100	100
School tobacco policy prohibits				
• Smokeless tobacco use by students	85	84	85	86
• Cigars and pipes by students	86	87	92	81
• Cigarette use by faculty and staff	88	84	92	90
• Smokeless tobacco use by faculty and staff	74	74	77	71
• Cigars and pipes by faculty and staff	77	77	85	71
• Tobacco advertising in the school building	99	100	92	100
• Tobacco advertising on school grounds	99	100	92	100
• Tobacco advertising on school buses and other transport vehicles	97	97	92	100

Note. NA = Not available.

Assessing Youth Risk Behaviors and School-Based Prevention Programs

TABLE 2 (continued)
 2000 Hawai'i School Health Education Profile Report—School Principal Survey

Item	Overall % n = 65	Middle school % n = 31	Mid/High school % n = 13	High school % n = 21
School tobacco policy prohibits (continued)				
• Tobacco advertising in school newsletters, newspapers, or other publications	99	100	92	100
• Tobacco advertising through sponsorship of school events	97	97	100	95
• Students wearing or carrying tobacco brand-name apparel or merchandise	85	87	77	86
• Tobacco use by posting signs marking a tobacco-free school zone	57	52	54	67
School security policy specifies				
• Visitors required to report to the office	100	100	100	100
• Closed campus (students are not allowed to leave during school day)	100	100	100	100
• Adults monitor halls during/between classes	92	90	100	90
• Routinely conduct bag, desk, or locker checks	7	0	15	14
• Require student uniforms	18	32	0	5
• Require students to wear ID badges	11	10	15	10
• Police or guards during the school day	55	45	46	76
• A peer mediation program	64	52	69	81
• A safe-passage to school program	12	6	8	24
• A program to prevent gang violence	62	74	54	48
• A program to prevent bullying	47	55	38	38
• A written plan for responding to violence at school	98	97	100	100
School HIV policy specifies				
• Protects the rights of students and/or staff with HIV infections	60	61	38	71

The majority of teachers taught important tobacco and HIV topics listed in the survey questionnaire. More than two thirds of teachers worked with physical education staff, and more than half worked with school mental health or social services staff on health education activities. However, only 14% worked with food service staff on health education activities. Almost two thirds of teachers provided families with information on the health education program.

Less than half, ranging from 5% to 48%, of teachers reported receiving staff development on particular health education topics during the past 2 years. However, many teachers, ranging from 49% to 91%, requested staff development on various topics. Teachers most frequently (80% or more) requested staff development on teaching skills for behavior change, teaching students with disabilities, using interactive teaching methods, violence prevention, tobacco-use prevention, suicide prevention, STD prevention, HIV prevention, emotional and mental health, and alcohol and other drug use prevention.

TABLE 3

2000 Hawai'i School Health Education Profile Report—Lead Health Teacher

Item	Overall % n = 62	Middle school % n = 26	Mid/High school % n = 15	High school % n = 21
A health education course required for students	100	100	100	100
Required to use these teaching materials				
• National health education standards	61	62	57	62
• State curriculum/guidelines	90	92	100	81
• District curriculum/guidelines	45	42	54	43
• School curriculum/guidelines	52	50	71	43
• Materials from health organizations	16	15	21	14
• Commercial textbook	26	27	36	19
• Commercial teacher's guide	22	23	29	14
Tried to increase student knowledge in these areas				
• Accident or injury prevention	90	88	100	86
• Alcohol or other drug-use prevention	100	100	100	100
• Consumer health	78	76	87	76
• CPR	70	68	60	81
• Death and dying	47	44	40	57
• Dental/oral health	63	64	93	38
• Emotional/mental health	97	96	100	95
• Environmental health	74	72	87	67
• First aid	82	80	80	86
• Growth and development	94	100	93	86
• HIV (Human immunodeficiency virus) prevention	100	100	100	100
• Human sexuality	96	100	100	86
• Immunization and vaccinations	59	56	80	48
• Nutrition and dietary behavior	99	100	100	95
• Personal hygiene	86	96	87	71
• Physical activity and fitness	97	100	93	95
• Pregnancy prevention	94	100	93	86
• STD (sexually transmitted disease) prevention	100	100	100	100
• Suicide prevention	69	64	64	81
• Sun safety or skin-cancer prevention	70	88	60	48
• Tobacco-use prevention	100	100	100	100
• Violence prevention	94	100	100	81
Tried to improve student skills in these areas				
• Accessing valid health information, products, and services	95	92	100	95
• Advocating for personal, family, and community health	81	80	87	80
• Analysis of media messages	92	96	100	80
• Communication	97	100	93	95
• Decision making	99	100	100	95
• Goal setting	96	100	100	86
• Conflict resolution	81	88	79	71
• Resisting peer pressure for unhealthy behaviors	97	100	100	90
• Stress management	91	88	100	90
Teaching methods used				
• Group discussion	100	100	100	100
• Cooperative group activities	99	100	100	95
• Role play, simulations, or practice	87	88	87	86
• Language, performing, or visual arts	74	81	53	76
• Pledges or contracts for behavior change	47	64	40	24
• Adult guest speakers	92	92	87	95
• Peer educators	58	54	50	71
• The Internet	63	65	60	62
• Computer-assisted instruction	45	42	53	43

Assessing Youth Risk Behaviors and School-Based Prevention Programs

TABLE 3 (continued)

2000 Hawai'i School Health Education Profile Report—Lead Health Teacher

Item	Overall % <i>n</i> = 62	Middle school % <i>n</i> = 26	Mid/High school % <i>n</i> = 15	High school % <i>n</i> = 21
Student activities used				
• Volunteer work in health	25	27	20	24
• School or community health fair	36	27	40	48
• Gather information about community health services	65	58	73	71
• Visit stores to compare prices of health products	33	31	27	43
• Identify potential injury sites at school, home, or in community	53	42	67	62
• Analyze advertising in community	76	77	80	71
• Advocate for health-related issues	61	58	60	67
Tobacco topics taught				
• Short-term consequences of smoking	99	100	93	100
• Long-term consequences of smoking	99	100	93	100
• Benefits of not smoking	96	100	87	95
• Risks of cigar or pipe smoking	86	92	80	81
• Short-term consequences of smokeless tobacco	86	92	80	81
• Long-term consequences of smokeless tobacco	90	96	80	86
• Benefits of not using smokeless tobacco	86	92	73	86
• Addictive effects of nicotine	99	100	93	100
• How many young people use tobacco	93	92	87	100
• Number of illnesses and death related to tobacco	93	88	93	100
• Influence of families on tobacco use	89	100	93	67
• Influence of media on tobacco use	96	100	93	90
• Social or cultural influences on tobacco use	80	77	93	76
• Finding valid information or services on tobacco-use prevention or cessation	81	85	73	81
• Making a personal commitment not to use tobacco	71	85	73	48
• Supporting others to prevent tobacco use	85	92	87	71
• Supporting others to quit tobacco use	85	88	93	71
HIV topics taught				
• Abstinence as most effective method to avoid HIV infection	99	100	100	95
• How HIV is transmitted	99	100	100	95
• How HIV affects human body	97	96	100	95
• How to correctly use a condom	69	56	80	81
• Condom efficacy (how well they work and don't work)	84	77	100	86
• Influence of alcohol and other drugs on HIV-related risk behaviors	99	100	100	95
• Social or cultural influences on HIV-related risk behaviors	83	81	87	86
• Number of young people who get HIV	92	92	93	90
• Finding valid information or services related to HIV or HIV testing	91	88	93	95
• Compassion for persons living with HIV or AIDS	91	88	100	90
Required tobacco prevention units/lessons taught in				
• Science	8	4	21	5
• Home economics or family and consumer education	12	8	29	10
• Physical education	30	35	21	29
• Family life education or life skills	19	15	21	24
• Special education	27	23	21	38
• Nonclassroom programs or activities	39	35	23	55

TABLE 3 (continued)

2000 Hawai'i School Health Education Profile Report—Lead Health Teacher

Item	Overall % <i>n</i> = 62	Middle school % <i>n</i> = 26	Mid/High school % <i>n</i> = 15	High school % <i>n</i> = 21
Required HIV-prevention units/lessons taught in				
• Science	14	12	29	10
• Home economics or family and consumer education	8	0	29	10
• Physical education	15	15	7	19
• Family-life education or life skills	20	15	21	29
• Special education	28	19	36	38
• Nonclassroom programs or activities	32	12	53	52
Health education staff have worked on health education activities with				
• Physical education staff	69	77	64	57
• School health services staff	45	42	43	52
• School mental-health or social-services staff	51	50	36	62
• Food-service staff	14	19	0	14
• Community members	69	69	57	76
Working with parents and families				
• Provided families with information on health education program	72	81	67	60
• Met with a parents' organization such as PTA to discuss health education program	24	27	33	10
• Invited family members to attend a health education class	41	38	53	40
Received staff development during past two years/would like to receive staff development on	Received/ Would like	Received/ Would like	Received/ Would like	Received/ Would like
• Accident or injury prevention	31/72	35/81	40/64	19/62
• Alcohol or other drug-use prevention	41/86	38/88	33/80	52/86
• Consumer health	13/76	12/77	0/64	24/81
• CPR	47/76	27/81	60/73	71/71
• Death and dying	5/70	8/77	0/47	5/76
• Dental/oral health	11/49	12/46	20/47	5/57
• Emotional and mental health	24/84	23/92	13/67	33/81
• Environmental health	14/76	19/77	0/60	14/86
• First aid	34/72	15/77	47/97	57/67
• Growth and development	20/71	27/73	14/97	10/71
• HIV prevention	48/85	38/92	40/73	71/81
• Human sexuality	35/79	31/77	20/80	52/81
• Immunization/vaccinations	18/67	19/69	13/64	19/67
• Personal hygiene	9/59	8/65	13/53	10/52
• Nutrition and dietary behavior	28/79	31/81	13/67	33/86
• Physical activity and fitness	26/75	19/81	27/73	38/67
• Pregnancy prevention	24/79	23/81	20/80	29/76
• STD prevention	31/84	23/85	20/80	52/86
• Suicide prevention	14/84	12/85	0/67	29/95
• Sun safety or skin-cancer prevention	9/71	12/73	0/67	10/71
• Tobacco-use prevention	31/87	42/88	7/87	29/86
• Violence prevention	41/91	46/88	27/87	43/100
• Teaching students with disabilities	27/84	23/96	33/67	29/76
• Teaching students with various cultural backgrounds	32/70	27/77	47/57	29/67
• Teaching students with limited English proficiency	33/78	38/81	33/86	24/67
• Using interactive teaching methods such as role plays or cooperative group activities	48/83	46/88	40/73	57/81
• Encouraging family or community involvement	15/78	15/84	20/67	10/76
• Teaching skills for behavior change	23/88	23/92	13/80	29/86

Assessing Youth Risk Behaviors and School-Based Prevention Programs

TABLE 3 (continued)

2000 Hawai'i School Health Education Profile Report—Lead Health Teacher

Item	Overall % n = 62	Middle school % n = 26	Mid/High school % n = 15	High school % n = 21
Major emphasis of professional preparation was				
• Health and physical education combined	52	57	50	45
• Health education	8	13	0	5
• Physical education	19	9	14	40
• Other education degree	10	9	29	0
• Kinesiology	2	4	0	0
• Science	4	4	7	0
• Nursing	2	4	0	0
• Counseling	2	0	0	5
Teaching experience				
• 1 year	5	4	13	0
• 2 to 5 years	24	12	33	38
• 6 to 9 years	27	46	7	10
• 10 to 14 years	15	12	7	29
• 15 or more years	29	27	40	24

In terms of professional preparation, only 8% of lead health education teachers reported that health education was their major emphasis. More than half reported a combined health-education and physical-education emphasis. Approximately 19% reported a physical-education emphasis, and 10% reported some other education emphasis. Most teachers had been teaching 2–5, 6–9, or more than 15 years.

Discussion

Results from the Youth Risk Behavior Survey and the School Health Education Profile Survey reveal many positive findings about the health-risk behaviors of Hawai'i youth and school efforts to address health-risk behaviors in the classroom. Students in Hawai'i middle and high schools demonstrated lower health-risk behaviors, in general, than did youth from across the U.S. In addition, all Hawai'i schools required courses in health education, and lead health teachers reported trying to increase student knowledge and skill in important areas.

Despite these positive findings, Hawai'i YRBS results indicate important areas of concern that should be addressed. Hawai'i students demonstrated increased health risks in areas such as believing their schools were unsafe, suicide-related behaviors, alcohol and marijuana use on school property, availability of illegal drugs on school property, marijuana use before age 13, unprotected sexual intercourse, weight loss attempts by students who do not perceive themselves as overweight, and lower enrollment in school physical education. The problem of unsafe schools, identified by students' perceptions of their schools, and the prevalence of alcohol and other drug use and

availability on middle and high school campuses require creative solutions. The openness of many Hawai'i school campuses makes it difficult to monitor and restrict access to them.

Suicide-related behaviors among Hawai'i secondary students have consistently ranked higher (worse) than those of students across the U.S. in all years in which the YRBS has been conducted. The prevalence of feelings related to depression, suicide ideation, plans, attempts, and injury is alarming. Likewise, sexually active students in Hawai'i tend not to protect themselves from sexually transmitted disease and unintended pregnancy to the same extent as their counterparts across the U.S.

Hawai'i secondary students appear vulnerable to negative perceptions of their body weight, with 32.9% of middle school students and 33.5% of high school students describing themselves as overweight. YRBS results reveal that a much lower percentage of students actually are overweight or at risk for becoming overweight. Still, 46.7% of middle school students and 47.1% of high school students reported trying to lose weight, many of these students having already identified themselves as not being overweight. In terms of healthy weight loss or maintenance, Hawai'i students have less access to physical education classes than do U.S. students.

Results from the School Health Education Profile demonstrate positive efforts in school-based prevention programs in health education. All schools require health education. Most schools have important health-related policies in place, and most lead health education teachers are attempting to increase knowledge and skills in important health areas. However, the lack of professional preparation and staff development in health education continues to be of concern in Hawai'i.

Recommendations

Support for school health education in Hawai'i has increased dramatically since the last YRBS and SHEP report (Pateman, Saka, & Lai, 2000). The American Cancer Society, Hawai'i Pacific, Inc., initiated the Hawai'i Partnership for Standards-Based School Health Education to support teacher education and professional development for the 1999 Hawai'i Health Content and Performance Standards. This public-private partnership resulted in 15 DOE teacher workshops, a Meadow Gold Dairy milk carton side-panel "Got Health?" campaign, two graduate-level summer institutes at the University of Hawai'i at Mānoa, and a statewide conference for health education in 1999–2000. In 2001, seven additional DOE teacher workshops, five summer institutes, and another statewide conference were planned. Detailed activities of the partnership have been reported previously (Pateman, Irvin, Nakasato, Serna, & Yahata, 2000). With the support of the Hawai'i Department of Health (DOH), tobacco-settlement monies have been allocated to the DOE to fund state and district health education and physical

education resource teacher positions to support prevention education and youth development programs in our state.

The focus of today's health education in Hawai'i is to help our young people learn skills consistent with the Hawai'i Health Content and Performance Standards, which focus on priority health-risk behaviors as the context for teaching important skills, such as obtaining valid health information, products, and services; self management; analyzing influences of family, peers, media, and culture; interpersonal communication; decision making and goal setting; and advocacy for health. Today's health education is designed to help children and adolescents navigate the decisions they must make about health risks on a daily basis and to achieve safe passage from childhood to adulthood.

To this end, Hawai'i schools need greatly improved teacher preparation and professional development in the area of health education. DOE/DOH collaboration and the Hawai'i Partnership for Standards-Based School Health Education will continue to support quality staff development for in-service teachers. However, the University of Hawai'i at Mānoa also must strengthen its commitment to health education in the College of Education (COE). A new health education course, *Personal and Social K-6 Health Skills*, is required for all elementary preservice teachers. In addition, plans are almost complete for a health specialization in the COE Master of Education Program, which can lead to DOE professional certification or endorsement in health education. However, the Bachelor of Education degree in secondary education with a major in health education remains closed at this time as a result of faculty and resource shortages. Because there are very few professionally prepared health education teachers in Hawai'i, required health education courses are often taught by teachers teaching out of field. As the Hawai'i and university economy improves, this program should be revised and reinstated to produce truly qualified health educators who can teach to standards in all of Hawai'i's schools.

Hawai'i's schools are working toward the goal of coordinated school health programs that involve collaboration among the components of health education, health services, healthy school environments, food service, counseling and psychological services, physical education, health promotion for faculty and staff, and community and parent involvement. With the commitment of school and community to the development of healthy youth, Hawai'i can continue to move toward its goal of becoming "The Health State."

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