Honolulu Community College  
Fall 2002 Faculty Survey for TCUP Planning Grant  
Funded by a National Science Foundation Grant

As part of the National Science Foundation TCUP planning efforts, Honolulu Community College (HCC) conducted a survey of faculty in the fields of science, technology, and mathematics. The survey asked faculty to rate the frequency of use of various instructional methods and technological enhancements in their teaching. The survey also sought their views on the major barriers that prevent Native Hawaiian and other minority students from majoring in STEM fields and assessed how interested faculty were in curriculum renovations.

The survey was divided into two parts, both of which were administered in an on-line format. The first part asked faculty to describe their use of instructional methods for each of their courses. The second survey solicited information regarding their views on barriers to learning and curriculum renovations. Of the 18 faculty members in the mathematics and science departments, 15 completed the survey for a response rate of 83%.

Faculty Use of Instructional Methods and Technology
Figure 1 illustrates the mean rating for uses of various instructional methods across science, technology and mathematics courses.

Lecture is clearly the dominant method. Student discussions and laboratory work are the next most used methods. Figure 2 shows how student preferences for instructional
methods as reported on a student survey compares to the faculty’s reported use of different methods. Students and faculty are similar in the value placed on lectures. However, students are as interested in interactive methods such as group discussions, laboratory work, and field trips as they are in lecture. This suggests that students might view curriculum changes that involved more frequent use of these methods as more effective for their learning.

Faculty members described the degree to which they use different types of technology in their classes. The mean rating for frequency of use is described in Figure 3.

Figure 2 Comparison of Student Preferences and Faculty Uses of Different Instructional Methods

Figure 3 Mean Rating of Faculty Use of Technology Aids
Calculators are the most commonly used aid. Visual presenters and computer aided instruction are the next most frequently used. The least used aids are LCD projectors and audio/visual aids.

Students also view calculators as the most important technology to assist their learning. Figure 4 compares faculty uses of technology with student ratings of usefulness of technology for learning.

Students tend to rate the value of technological aids for learning highly. This would suggest that increasing use of technology in courses, especially uses of visual presenters, LCD projectors and computer aided instruction would be welcomed by students.

**Faculty Experience with Learning Communities**

The faculty was asked whether they had experience teaching in teams or teaching students who remained together in a cohort. Table 1 describes experience with team teaching.

<table>
<thead>
<tr>
<th>Experience</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>None</td>
<td>67%</td>
</tr>
<tr>
<td>Very little</td>
<td>20%</td>
</tr>
<tr>
<td>Quite a bit</td>
<td>7%</td>
</tr>
<tr>
<td>A great deal</td>
<td>7%</td>
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</tbody>
</table>

Very few faculty members reported having any experience teaching with colleagues. Also, only 20% had taught student cohort groups.
Faculty Interest in Various Curriculum Projects
The faculty was asked to rate their interest in various approaches to curriculum revision. As indicated in Figure 5, there is a strong interest in working on the development of more experience-based, hands-on lessons in STEM courses. None of the faculty indicated that they had no interest. The majority (66%) is very to somewhat interested and one-third want to learn more about doing this type of faculty collaboration.

As shown in Figure 6, there is interest, in working on the development of linked courses that are taught to the same students during the same semester. An example would be linking a chemistry and biology course or mathematics with a science course. Approximated one quarter of the faculty are not interested in linking courses. However, another quarter are interested in learning more. Just under half are somewhat to very interested.
Figure 7 describes interest in integrating two courses together that would be taught during the same block of time. One third of the faculty members are not interested in exploring this type of curriculum and course integration. Slightly more than one third (42%) are somewhat to very interested, and 21% are interested in learning more about this approach.

![Figure 7 Interest in Integrating Courses to be Taught in Same Block of Time](image)

Figure 8 illustrates faculty members’ interest in developing an integrated seminar that pulls together subjects across the sciences and engages students in critical thinking.

![Figure 8 Faculty Interest in Integrated Seminar Across Science Areas](image)
Over half of faculty has an interest in exploring integrated seminars. 20% would like to learn more, and slightly less than a third are not interested.

The faculty was asked if they were interested in developing field trips that integrated lessons from various STEM courses. Figure 9 describes their responses.

![Figure 9 Faculty Interest in Developing Field Trips that Integrate STEM courses](image)

Slightly less than half of the faculty is not interested in doing field trips and only 13% want to learn more. However, almost half of the faculty has an interest in doing integrated field trips.

Given that over a third to half of the faculty indicated interest in working together to investigate ways to integrate their subject areas it is not surprising that one third are definitely interested in more training in creating learning communities and developing integrated courses. Table 2 describes interest in this type of training.

| Table 2 Interest in Staff Development for Learning Communities and Course Integration |
|--------------------------------|-----------------|
| Yes, definitely | 33% |
| Will consider | 47% |
| No | 20% |

Faculty was asked in an open-ended question whether there were any other ways they would like to work on more interdisciplinary approaches to teaching or learning communities. Four respondents offered the following comments.

- *I would like to work with someone who has experience in the real world and learn what type of STEM courses are required for success in that job situation.*
- *We have to go outside the textbook and make the learning meaningful and Hawaii-oriented.*
• Studying the environment touches on geology, meteorology, chemistry, physics, oceanography, microbiology, astronomy, biology, ocean voyaging, agriculture, fisheries, topography, medicinal plants, etc.
• Combining excursions, problem solving, student research, and hands-on learning would be powerful interdisciplinary modes of learning. I specialize in Pacific Island Studies, and could contribute substantially to Hawaiian Studies curricula seminars or symposiums

Faculty Interest in the TCUP project
The faculty is also interested in the TCUP planning project; 47% said they were definitely interested learning more, 33% would consider an interest in learning more and 20% had no interest. Finally, 47% said they would like to participate in the planning for a TCUP proposal, 40% are willing to consider participation in planning, and only 13% had no interest.

Faculty Views regarding Barriers/Solutions to Student Learning
An open-ended question asked faculty to describe the major barriers that prevent Native Hawaiian and other minority students from majoring in mathematics, sciences, engineering, or information technology at Honolulu Community College. The reasons given were organized into the following categories. Their words are included under each category title.

Poor motivation and self-confidence
• They lack motivation.
• They lack self-esteem and do not set high goals of achievement for themselves.
• I think that the mathematics scares them - a trend found all over today.
• Lack of self-confidence
• Also, it could be a cultural-social thing where especially female Native Hawaiian students always felt that they are not good in mathematics.
• Lifestyle; culturally not motivated or disciplined to study math/science. These subjects can intimidate students, due to lack of experience with them. They may think they "can't do it" or it is not interesting.
• Lack of interest

Poor high school preparation
• Poor high school background...
• Poor math preparation from elementary to high school.
• Many of these students did not take the proper courses. In addition, many of them were not counseled to enroll in the right courses in order to do well in these fields.
• Poor preparation for science.
• Poor preparation in math, lack of prior science courses.
• Lack of adequate school preparation,
• Communication skills and reading comprehension often are the major barriers to their mastery of the technical skills.
Lack of opportunity for those wanting to say on Islands
• There are not many STEM jobs (other than teaching) available in Hawaii for the Native Hawaiians.
• Native Hawaiians have a strong sense of family and would strongly prefer to work in Hawaii.
• Cultural values ... opportunities

Life forces and need for more support
• The forces that prevent these students from majoring in STEM fields are exerted long before they enter college. It seems to me that these forces are socioeconomic in nature. ... I don't see barriers here. However, some difficulties faced by students are inadequate knowledge of prerequisite math/science skills and concepts, and the consequent need for both academic and emotional support. It's tough to be behind other students, that's where the emotional support comes in -- perhaps the Haw. Studies tutoring/studying room will help here. ...
• Many of the minority students seem to need additional one-on-one tutoring to supplement the normal classroom-learning environment.
• Perception by students, parents, high school teachers, etc. that community college is for remedial students. ...

Faculty were also asked it they had any suggestions for overcoming these barriers to encourage more Native Hawaiian and minority students to major in mathematics, sciences, engineering or information technology? The reasons given were organized into the following categories. The words written are included under each category title.

Provide opportunities to experience success and models for success
• If we can get these people to experience more success in their math courses, they would not be afraid of taking it. So the key is "success".
• Having successful experiences will help their self-confidence. Therefore, as a school we should do all we can (workshops in overcoming math anxiety, for example) to promote self-confidence.
• It would also help to have peers who have overcome attitudinal and academic obstacles to successfully complete math/science courses talk with entering students or students in high school.
• They need to realize that high standards, hard work and getting help from teachers, peers, and tutors can enable them to succeed.
• Have a fair with all the disciplines showing what they are like. Have knowledgeable people available for the students to talk to, one-on-one. ...
• Exposure to different kinds of jobs;

Influence K-12 preparation
• They should be required to take more math in high school.
• Have more outreach efforts targeting K-12 public schools that are located in districts with a high population of Native Hawaiians and minority students.
• Better counseling from grade school through college.
• Require that all students take math and science courses in K-12. Although I don’t see any barriers, I also believe that if the k-12 science/tech curriculum could be enhanced and enlivened, more students would consider those majors and careers.

• When HCC faculty has assisted in the k-12 classrooms, student interest has risen. Teachers also get more connected with HCC when they see us helping their educational efforts. ...

Provide support and counseling

• Have more support services for Native Hawaiian and minority students (tutoring, computer skills, learning skills, etc.)

• Offer special programs to help them develop better communication and reading comprehension of technical material. This would not replace the writing intensive or ESL courses, but just concentrate on “word type” problems that require only basic arithmetic. These courses could be either self-paced or paired up with another course in the technical field that would center on application problems in the other discipline.

• Encourage them to study and be more disciplined

• Mandatory counseling for all scholarship grantees

• Provide opportunities and financial support

Make courses more relevant

• I suggest making courses more interesting through technology-enhanced instruction.

• In some courses, instructors may choose example that are Hawaiian in nature: For example, a class can study data concerning the growth rate of the population of Oahu as a practical application of exponential functions.