

TWO COMPLEMENTARY PROGRAMS DESIGNED TO ENHANCE THE SCIENCE AND ENGINEERING ENVIRONMENT

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INTRODUCTION

Washington State University supports two programs running sequentially to assist students through their first crucial year of college. The first program is the Bridge Workshop which supports women and underrepresented minority students in the transition period from high school or community college programs to the university environment. The second program, the Science, Engineering and Mathematics (SEM) Residence Hall Program, offers a supportive living and learning community in which students of similar academic interests are housed together.

This paper discusses the two programs and gives preliminary results from a survey addressing the experiences of Bridge students detailing motivations for becoming SEM students, their residential choices, primary goals for the college years, extracurricular activities, commitment to their major, academic disappointments and achievements, barriers and positive influences encountered, academic services utilized, general study habits, and what they would do differently if they had to opportunity to start over.

BACKGROUND INFORMATION

Bridge Workshop

The Minority Engineering/Science Program (MEP) and the Women Engineering/Science Program (WEP) began in 1989 with the purpose of assisting underrepresented students in their adjustments to the WSU campus and providing a supportive environment for them throughout their academic programs. The objective of the MEP and WEP programs is to retain students in the engineering and science majors.

The MEP and WEP offer the following: Bridge Workshops for new students; scholarships; organized tutorials and study groups; a study room for group or individual study or relaxation; academic and personal advising from the MEP/WEP director; opportunities to network with other women and minority students in upper division classes; a resource center for internships and summer jobs; numerous publications of interest to WEP and MEP students; and an introduction to the student chapters of the Society of Women Engineers, Society of Hispanic Professional Engineers, National Society of Black Engineers, and the American Indian Science and Engineering Society.

The first Bridge Workshop was held in August 1990. Since its inception, 283 students have participated (139 through MEP and 144 through WEP). The largest workshop to date included 71 participants.

The Bridge Workshops are held one week prior to fall registration. They provide a complete orientation to all support areas available to students in the university and community. The students are pre-advised and enrolled in "cluster" classes which allow them to be in the same sections with other students they have met through Bridge. Some cluster classes accommodate as many as half of the class being Bridge students. Students have a sample of what to expect in classes through an orientation presented by the math and chemistry teaching faculty. The Bridge students participate in a one-day computer center workshop which provides them with practice using the computer, an opportunity to learn the features available through the internet, and the confidence to take advantage of the computer services.

SEM Residence Hall Program

The SEM Hall was initiated in 1991 in an effort to create an environment where women could thrive in disciplines in which they are traditionally underrepresented. It was patterned after the Bunting-Cobb Residence Hall Project in Douglass College at Rutgers. By clustering students with similar interests and demands, the hall fosters the development of the academic/social networks that support their goals.

Specific benefits for students in the SEM Hall include the following:

- The support of living with others who share their interests and ambitions.
- Being surrounded by potential study partners (other students enrolled in the same courses) and role models who are further along in their studies.
- In-hall programs and resources designed specifically for students interested in SEM.
- A state-of-the-art computer lab located in the hall and equipped with the software widely used in SEM classes.
- Tutor-assisted study hall for entry level mathematics, physics and biology courses.
- Access to drafting tables.
- Study and meeting rooms on each floor.
- Resident advisors, most of whom are SEM majors.

The original concept of the SEM Hall was to have a program focused entirely on women, but through student input it evolved into the coeducational project of today. During the rapid growth period, an imbalance between the women and men was allowed, but the goal is to have a one-to-one ratio between women and men residents. A table illustrating the growth of the project is given below:

Academic Year	Residence Hall	# female residents	# male residents
1991-1992	Stephenson North	25	25
1992-1993	Orton	90	170
1993-1994	Goldsworthy	80	200
1994-1995	Gannon/Goldsworthy	128	284
1995-1996	Gannon/Goldsworthy	142	326
1996-1997	Gannon/Goldsworthy	213	306

One of the most popular aspects of the SEM Residence Hall Program is the tutor-assisted study hall. It is staffed Sunday through Thursday evenings from 6:30-9:30 with mathematics, physics and biology tutors. It is set up as a study hall with tables designated for particular courses and the tutors circulate to answer questions as needed. The students seeking help are encouraged to work together as well. This service is advertised in all of the relevant courses and is open to any student enrolled, not just SEM Hall residents. Over 200 students visit the study hall each week. The tutors are supplied by the Mathematics Department, the Physics Department, the Program in Biology, Residence Life, the College of Sciences, and the College of Engineering and Architecture.

The SEM Hall is also the focal point for special events such as the annual SEM Advising Fair, the SEM Club Fair, visits between small groups of residents and distinguished visitors, and programs on internships and résumé writing. Of these events, the most far-reaching (in terms of number of students affected) is the Advising Fair.

Two weeks prior to the Spring pre-registration period (one week before students meet with their advisors), the SEM Advising Fair is held in the SEM Hall. The fair is an opportunity for SEM students to get information from well informed faculty members and upper division students that is not readily available from their advisors.

The fair includes

- details about courses outside the advisor's department,
- majors or minors in other departments,
- student clubs,
- scholarships,
- international exchange programs,
- research and work opportunities within departments,
- honors information, and
- career opportunities.

The fair is advertised within the SEM Hall and in all entry level math, science, and engineering classes. The attendance has been very good (approximately 100 students) and students have expressed sincere appreciation for the ready availability of information at a time when many are trying to settle on a major.

PROGRAM EFFECTIVENESS

All Bridge students are encouraged to live in the SEM Hall their first year and approximately 50 percent of them choose to live there for at least one semester. Thus, in order to gather information about the two programs and their effects on the students, all former Bridge students were given written surveys asking their motivations for becoming SEM students, their residential choices, primary goals for the college years, extracurricular activities, commitment to their major, academic disappointments and achievements, barriers and positive influences encountered, academic services utilized, general study habits, and what they would do differently if they had an opportunity to start over. The written survey was sent to the 252 students who participated in the WEP and MEP Bridge Workshops in 1993, 1994, 1995 or 1996. There were 135 returns (approximately 50 percent). The

written surveys were followed up by personal interviews of a limited number of the participants.

The results of the surveys were entered into a data base and are currently being analyzed. Some preliminary results are summarized here.

Positive influences that were cited numerous times included special attention received from the MEP/WEP Director and mathematics teaching assistants.

Academic achievements included success in the Honors Program, the ability to finish a math course in spite of a lack of appreciation of the material, and making it on the President's list.

Barriers encountered included teaching assistants who didn't explain, professors that don't seem to care about teaching or were not in touch with student needs, mathematics courses, chemistry courses, and bad advising.

If given the opportunity to start over, many students said they would study harder, study more, and improve their time management skills. In particular, a common theme among SEM Hall residents was that if they could start over, they would study harder at the beginning. The wisdom of this statement could possibly be a reflection on the fact that the SEM Hall residents are aware of the resources available to them and the possible benefits they could derive from them.

CONCLUDING REMARKS

There is work to be done with the survey data. Descriptive tables will be constructed for different aspects of the survey and will be broken down by major, gender, ethnicity, and residential choice to further aid in identifying trends. Qualifying the results will also occur through personal interviews.