

## ACADEMIC SUPPORT SERVICES AND THE LEARNING ENVIRONMENT

Patricia K. Bailey

Stevens Institute of Technology  
Hoboken, New Jersey

There are many factors that impact on student persistence in engineering: academic performance, financial aid, perception of and access to career opportunities, level of satisfaction with choice of college and choice of major, parental support. Retention efforts must address the wide variety of student needs and concerns and require the active participation of all college departments and personnel. This paper will describe the retention programs and services at Stevens provided by the Office of Women's Programs and the Academic Support Center.

Stevens is a private, non-denominational college with 140 full-time faculty members, 1,300 undergraduate students and 2,000 graduate students. The undergraduate curriculum spans five disciplines: engineering, science, humanities, computer science and management and includes pre-professional and accelerated programs in pre-medicine, pre-dentistry and pre-law. The majority of Stevens undergraduates (80%) are engineering students. Women currently represent 20% of the total undergraduate student body and 17% of the engineering undergraduates. In 1990-91, women were 25% of the first-year students and 21% of the first-year engineering students.

### Office of Women's Programs

Stevens began admitting women in 1971. The Office of Women's Programs (OWP) was established in 1978 to enhance the recruitment and retention of women. A primary concern of OWP is to assist students in acclimating to college life and the Stevens environment. Through a variety of activities, OWP staff seek to create a sense of community among women on the campus and to encourage students to take full advantage of the learning opportunities and support systems available to them.

One-On-One Meetings are scheduled with each new female student within the first two months of the fall semester. Students receive a letter in their campus mailbox introducing them to the Office of Women's Programs and asking them to come to a meeting. "The purpose of this meeting," the letter reads "is to meet you, learn of your interests and concerns and let you know of

resources and services available to you." Between 70% and 80% of the students participate in these meetings.

This year, OWP enlisted the help of the resident assistants in the freshman women's dormitory to conduct these meetings and subsequent follow-up meetings with students experiencing academic difficulty. A questionnaire was developed which serves as a guideline for students and staff conducting meetings. As outlined in the questionnaire, topics of discussion include reasons for coming to Stevens, choice of major, parental support, how the student feels she is doing academically, study habits, financial concerns, roommate issues, extracurricular activities, and the student's general satisfaction with her college experience.

An Annual Women's Luncheon is planned early in the fall of the first semester to introduce new students to other undergraduate women, alumni, faculty and administrators. The luncheon has become a popular tradition at Stevens and is attended by more than 70% of the first-year and transfer women students.

As advisor to the student chapter of the Society of Women Engineers (SWE) and the Panhellenic Association of sororities, OWP works with students throughout the year to organize activities that will enhance their career development and provide leadership opportunities. SWE activities include field trips to local industries, seminars with professional women in engineering and science, and a technical essay competition on topic of women's contributions to engineering and science. Cash prizes of up to \$1,000 are awarded to contest winners. A new organization on the campus, the Panhellenic Association now governs the three Stevens sororities and gives women a stronger voice in interfraternity affairs.

Student Involvement in Pre-college Programs. A second focus of OWP is career development at the pre-college level. Although primarily designed to interest and recruit high school and middle school students into the engineering profession, the pre-college programs have an impact on college student retention. OWP involves undergraduate women in all aspects of pre-college programming, as program speakers, resident/teaching assistants and interview subjects profiled in OWP's newsletter. In communicating to pre-college women their academic successes and struggles, goals and career choices, college women gain confidence and renewed their commitment to an engineering education.

### Academic Support Center

In 1987, Stevens established the Academic Support Center (ASC) which has made a significant contribution in reducing the attrition rate between the freshman and sophomore year from a high of 27% during the decade preceding its establishment to the current rate of 12%, with rates for women and men being generally equal. The principal causes of attrition that ASC programs and services were developed to address are:

1. insufficient secondary educational preparation in mathematics and science;
2. difficulty in adjusting to the college environment and new academic demands;
3. loss of confidence as a result of receiving bad grades.

ASC seeks to provide early intervention, individualized attention, continuous contact, and a comprehensive academic support system.

A Mathematics Diagnostic Exam is given to all incoming freshmen to identify students who are likely to have difficulty with technical course material. Students who score low on the exam are assigned to a 16-hour mathematics review session, provided during the first 2 1/2 weeks of the fall semester.

Weekly Review Sessions are offered for all of the major first- and second-year technical core courses. Reviews are conducted during one evening of every week for 2-3 hours each. Review instructors, generally PhD students, strive to provide comprehensive coverage of course material, emphasizing problem-solving applications and encouraging students to ask questions.

Attendance, for the most part, is voluntary. Students who are having academic difficulty as evidenced by their first semester final grades and/or second semester mid-term grades are required to attend, and their attendance is monitored. Some review sessions are better attended than others, and attendance is always at its highest the week of freshman quizzes, given four times per semester. For example, the night before a physics quiz, 80-85% of the freshman class attend the physics review session.

Electronic Archiving of Exams. One of the major undertakings of ASC has been the electronic archiving of old core course exams on computer files for students' use via the campus network. In most cases, exam solutions are also available. According to accounting information from the Stevens Computer Center and results from student questionnaires, the electronic exam archiving system is widely used and considered an integral part of the test preparation process.

One-On-One Tutoring is available free of charge to all freshmen and sophomores in need of assistance. This service is provided for all of the major technical core courses. Approximately 50% of the first-year students request and receive occasional tutorial help, and 25% receive tutorial help on a regular basis.

The Stevens computer network allows students to request tutorial services electronically through the use of their personal computers. (Note: All Stevens students are required to purchase a computer upon admission). The tutor request program was designed to allay possible embarrassment or hesitation in expressing the need for help. Tutor assignments are made within a 24-hour period, and students are notified via their campus mailbox.

A database management system is used to select and schedule tutors. Tutors are upper-class students in the top 10% of their respective classes. During the 1990-91 academic year, ASC employed 120 students as tutors, 30% of whom were women.

The Five Year Program offers students a reduced academic course load in each of the first 8 semesters. Through a strategically planned sequence of course deferrals to subsequent terms, baccalaureate studies are then completed in five years.

It is important to note that the student does not pay any tuition during the fifth year, provided s/he enrolls in the five year program no later than November 1 of the freshman year. Students have the option to enroll in the five year program at any time prior to the beginning of the fourth semester. In this case, students are required to pay only 50% of the tuition for the fifth year of study.

The Intersession Program offers first- and second-year students who fail a technical course during the fall term and opportunity to repeat the course and to regain good academic standing by the start of the spring term. Intersession runs for two weeks, beginning immediately after the Christmas/New Year holiday and ending before the start of the spring term.

The percentage of freshmen involved in the Intersession Program has been in excess of 33%. During the 1990-91 academic year, enrollment dropped below 25%. This drop is attributed to the success of the fall semester academic support programs.

In 1991, tuition for students to attend Intersession was \$1,300. Students who earn a C grade or better receive a 50% tuition rebate. On average, 80% of intersession students do earn a grade of C or better.

Students have a second option to make up deficiencies in their academic records by retaking failed courses during one or both of two summer sessions.

The Intensive Teaching Environment (ITE) Program was piloted in 1990-91 to further improve the retention of the weakest 15% of the freshman class enrolled in the engineering/science curricula. The principal reasons for attrition amongst this group of students are insufficient secondary educational preparation in mathematics and science and problems in adjusting to the college environment. These students often begin to believe that they can not succeed in college, and most terminate enrollment during the freshman year.

Students who have grades of D or F in Mathematics, Physics and Chemistry at midterm of the first semester are invited to participate in the ITE program. ITE students restart their first semester mathematics and physics courses and defer chemistry through enrollment in the Stevens five year program. Current course grades in these classes are erased.

ITE students receive 6 hours of instruction per week in mathematics and 5 hours of instruction per week in physics, as compared to the 4 hours of mathematics instruction and 3 hours of physics instruction they previously

received per week. ITE begins at midterm of the first semester and continues for 8 weeks, ending in January during the latter part of Intersession. In the second semester, ITE provides students with 50% more instruction time. Students are also assigned to study groups of 5-7 students. The study groups meet twice weekly for 1 1/2 hours and are led by well-qualified, advanced undergraduate students.

In the first year of the program (1990-91), 30 of the 60 eligible students participated, including 10 women students. Results from the first year of the pilot program are not yet available, but it is believed that at least 50% of the target population will be retained and successfully complete baccalaureate studies through the five year program.

