

Support Programs for Graduate Women in Engineering on a \$hoe \$tring

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Women still face unparalleled challenges entering and remaining in engineering. Much of the recent research on poor retention and persistence underscores the "chilly climate" these groups face academically and professionally. In response to these crucial issues of retention, attachment, persistence, and success, Carnegie Mellon University, as many other institutions, is developing a comprehensive program for undergraduate, graduate, and faculty women in both the sciences and engineering. We recognize that women face different challenges, have different goals, and possess different experiences: they are not monolithic. The institution is endeavoring to better understand and overcome the ways that limit the involvement of our diverse "majority" and "minority" women.

As a small private research institution with approximately 4,400 undergraduates, 2,700 graduate students, and 600 faculty, Carnegie Mellon has earned an international reputation for research and innovation in the science and technical fields where women are traditionally under-represented. Although some of the 7 colleges and 27 departments have long offered support programs for women, until recently there was no centralized programming to serve women in all fields and at all levels.

For the context of this paper, we will use the support programs offered by Carnegie Mellon's Office of the Associate Provost for graduate women in engineering as an extended example.¹ We do not intend this as a case study nor idealized model; rather, we hope that our experience in developing these programs will provide the opportunity to explore the many ways administrators and faculty are supporting, and may support, women students and faculty in all fields and particularly in the sciences and engineering.

Carnegie Mellon's current programs grew out of a series of soft money pilot initiatives² first launched in 1989 by the Associate Provost for Academic Projects and now include:

¹Carnegie Mellon has a number of other support programs, particularly for under-represented students of color through the Carnegie Mellon Action Project (C-MAP) program.

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- **General support services for graduate students** including a faculty/student academic support seminar series and a one day retreat.
- **Focused support programs for women** such as a luncheon series, a faculty women's breakfast series, and a speaker series focusing on gender.
- **Focused support programs for students of color** including a one day seminar, a graduate students of color speaker series, and informal monthly dinners for doctoral students.
- **Special initiatives** such as a *Field Guide to Women in Science and Technical Fields* and a conference entitled "Bridging the Gender Gap in Engineering and Science: The Challenge of Institutional Transformation."

Evidence to date indicates that our programs have been successful in promoting both a sense of excitement about being a scientist or engineer and a sense of belonging to a larger community of successful women. We attribute much of our success to the five principles outlined below.

Principle #1: Obtain buy-in from key constituencies

Housed within the central administration in the Office of the Associate Provost for Academic Projects, our support programs started small with crucial support from key players at the university. These included faculty and associate deans who cared deeply about women and were well respected within the colleges and departments. Several faculty members were recipients of the university's highest teaching and advising awards. We also included our critics—those who expressed concern that the university would be duplicating or interfering with the responsibilities of the academic departments. From this group we formed several faculty and student advisory boards for support programs for women in science and engineering. These advisory boards have played critical roles in developing the mission and goals for each of our support programs.

In addition to advisory support, each of the colleges has been asked to and has provided financial support for our programs. Deans of the Engineering, Computer Science, and Science colleges have given extra support to fund special projects—a dinner for all women in science and engineering, as well as an annual conference for graduate women. The colleges are given credit for each general and special gift and students are encouraged to thank the deans for sponsorship.

Raymond Wean Foundation, Westinghouse Electric Corporation Campus Recruiting Program, The Pennsylvania Space Grant Consortium Program, Howard and Nell E. Miller Foundation, Information Networking Institute and the Carnegie Bosch Institute of Carnegie Mellon University.

Principle #2: Listen and respond to students, faculty, and staff

Our advisory board recommended that we expand. In response, we developed programs that support women at all levels. We are aware that many women in the under-represented areas of science and engineering need extra support early in their academic careers to sustain and retain them. This fall we organized a dinner for undergraduate and graduate women in our science and engineering colleges and all the faculty in these schools. We placed each student at a table with women and faculty from her own department; the networking that occurred was a boost for everyone who attended. "I thought the dinner was a great opportunity to meet faculty and senior students that we would not have had the opportunity to meet. The discussions at the individual [tables] were invaluable!" At the request of department heads, next year's dinner will include women in technical fields located in the other of our colleges.

Like the often rocky transition from high school to college for undergraduates, graduate students can experience many difficulties. Few graduate students enter a graduate program fully equipped with the skills and knowledge necessary to succeed in the graduate environment. The Graduate Advisory Board for women and students of color in science and engineering has developed a number of programs to address this "hidden academic curriculum." We offer an on-going Graduate Student Seminar Series (GSSS) designed to address this curriculum through presentations by graduate students and faculty. Topics include: "Planning the Academic Job Search," "Handling Stress Through Goals," "Relaxation and Fitness," "Negotiating an Offer Once the Offers Come In," "Time Management," and "Finding a Mentor." While the proportion of women graduate students and faculty is relatively small in our colleges of science and engineering, the proportion of women attending and speaking at these events is quite high. Students and faculty of color are over represented at these events as well.

While the Graduate Student Seminar Series addresses issues pertinent to the whole community, there are concerns that affect only women. A one day retreat, "Herstories: Personal Narratives of Academic Survival and Success," provides the opportunity for women faculty members, graduate students, and undergraduates considering graduate school to share strategies on how to be successful in the academy. This year's retreat involved many women faculty on campus in such panel discussions as: "Sharing Academic Survival Stories," "Measures of Success: Where Do I Fit In?" "How to Survive Coursework and Qualifiers," "How to Choose Your Battles," "What Does it Take to be a Successful Scholar," and "Mentoring."

In the fall of 1995, we will be hosting a major conference on institutional change: *Bridging the Gender Gap in Engineering and Science: The Challenge of Institutional*

Transformation. This conference will facilitate at the sharing of experiences, theories and strategies for institutional-level change. Papers and comments will focus on identifying crucial barriers that hinder women as they practice science and engineering and suggesting bold new ideas and practical programs to change this situation. By bringing together students and key decision makers in the academy, we hope to promote truly important discussions. This conference will offer women opportunities to network and make personal contact with role models in their fields.

In addition to these formal programs, we offer informal networking opportunities through programs such as the Words of Wisdom (WOW) luncheon series. Organized by women graduate students, WOW focuses on issues of particular concern to doctoral women students and provides participants the opportunity to meet women from other departments, to network, to learn from each other's experiences, and to honor women's achievements.

Faculty women's involvement in intervention programming has been exceptionally strong and their support as role models is critical to the undergraduate and graduate women on campus. Many women faculty, particularly in the sciences and technical fields, have asked for a forum for mutual support in a predominately white male community. In the fall of 1993, we initiated the monthly Faculty Women's Breakfast meetings. This new program has been welcomed by faculty women across campus as an opportunity for interaction and networking.

Principle #3: Work within the culture of the institution to maximize success

Recognizing and being sensitive to Carnegie Mellon's unique culture was key to developing successful programs. As at many colleges and universities, Carnegie Mellon's power lies within the departments. We were careful to build upon the successful models already in place rather than install identical programs in each department solely for the sake of continuity.

Based on the success of the Graduate Student Seminar Series and the one day retreat for women, we developed a speaker series in conjunction with the nearby University of Pittsburgh. "The University of the 21st Century: A Focus on Gender" concentrates on how gender influences the university system. By bringing pertinent issues to discussion, the series seeks to encourage transformation in the institution, as opposed to the transformation of the individual.

Also in conjunction with the University of Pittsburgh, we have organized another speaker's series, "Celebrating Graduate Students of Color." These women and men face unique challenges and bring diverse experiences and invaluable perspectives to the academy. Since Carnegie Mellon has a small number of

graduate students and faculty of color, these events provide opportunities for undergraduates and graduate students to meet together as a community with some critical mass. We also held a one day retreat "Positioning Yourself for Success." In addition to expanded networking, participants discuss a variety of common concerns and the potential rewards of an academic career. On a more informal basis, Carnegie Mellon doctoral students of color organize monthly dinners to provide opportunities to meet people from other departments and to learn from the diversity of student experiences.

Carnegie Mellon's culture also lends itself towards a suspicion of empire-building with an emphasis on a lean and efficient administration. In keeping with this, our staff is quite small — the Special Projects Office within the Office of the Associate Provost has one part-time program coordinator and one part-time graduate assistant and one part-time undergraduate assistant. We also operate very lean. We seek smaller, sustainable grants from our funders which allow us to pilot new initiatives while developing the necessary internal resources to support successful programs in the long term. In addition, we share credit *and* responsibility for our programs with colleges and departments to foster an important sense of ownership. For instance, the Special Projects Office sends copies of thank you notes to the speaker's dean or department head. In all of our efforts, we are judicious about change: we are ready to move beyond a program when it has outlived its purpose.

Capitalizing on the realization that Carnegie Mellon is a computer driven university, we have been able to lower our publicity expenses by making use of the electronic bulletin boards belonging to each department and student group. We have found that students prefer to receive information about events through this medium, rather than printed notices which tend to be ignored. We send reminders via e-mail to those who register for events to maximize the number of attendees.

Principle #4: Make support programs for women a priority

By housing our programs within the Office of the Provost, Carnegie Mellon literally and symbolically made support programming for women a university priority. Responsibility for the program falls under the Associate Provost for Academic Projects who works directly with the Provost and Vice Provost for Education. These administrators work diligently to bring visibility to women's concerns. The President rarely lets a speech go by without mentioning our efforts.

Physical space was also important in making support for women a priority. By placing us in prime office space at the heart of campus, the administration gave both legitimacy and accessibility to the program. Within one month of our move to our present location, walk-in student traffic had increased nearly four-fold.

Perhaps most importantly, Carnegie Mellon has made support for women a financial priority by establishing an annual budget for many of our programs (all of which started on soft money) to cover some of our administrative expenses. The position of Special Projects Coordinator was funded during the past year enabling us to offer more programs. The administration has also given priority to fundraising for women's concerns by assigning development staff to work directly with the program and by placing options such as undergraduate research on the "menu" presented to potential donors. While we continue to aggressively raise outside funds to subsidize our programs, the stability provided by a secure financial base can not be over-emphasized.

Principle #5: Keep your programs in the spotlight

Even after programs have met with success and are running smoothly, a significant portion of our time is spent keeping the spotlight on women's concerns. The little things make a big difference in our efforts to support women both academically and professionally. Each year we:

- give presentations at campus events including Graduate Student Orientation and New Faculty Orientation
- use logos on campus wide advertisements to promote visibility and program recognition
- keep deans, department heads, and other key players up to date on our programs
- publish a comprehensive report on each of our programs
- distribute small mementos with logo/name of event for special programs
- write letters of recognition and send press releases to students' hometown papers

By reaching out to all women at many levels and by persistently bringing women's concerns into the campus dialogue, we have maintained a focus on and critical momentum for our support programs.

Clearly, we are pleased with the results of our programs to date. We have carefully designed each of the support programs to effect change in the paradigms where our university, as well as society in general, imposes environmental constraints on women graduate students. We believe that we are making real progress in ways that will be helpful to our community and to others.

Changing existing systems is not a quick process. The next years will be critical in developing a more sophisticated understanding of the perceptions and practices in the university environment that need to be addressed, initiating

programs that will effect change, and implementing and testing new components which best meet these challenges at Carnegie Mellon.

While there are many different models of support programs for women in science and engineering—including departmental and college level programs, summer programs, and centralized support programs—and there are many different conditions affecting the culture of an institution, we believe the five basic principles described here provide a strong framework for all administrators who wish to promote the retention and persistence of women in the sciences and engineering.

