

Practices for Recruiting and Retaining Graduate Women Students in Computer Science and Engineering

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ABSTRACT

Producing a continuous supply of well-trained, high-quality IT professionals poses the greatest challenge of U.S. competitiveness over the next decade. A largely untapped talent pool is among women who currently participate in computer science and engineering education at low rates, and subsequently, in academia and in industry. This paper summarizes current practices by Computer Science and Engineering departments aimed at recruiting and retaining graduate women students. It also outlines the need for research to study the effectiveness of these practices.

1. Introduction

Statistics from the U. S. Department of Education show that, in 1995-1996, women earned 27.5% of B.S. degrees in Computer Science, while they earned only 26.7% of master's degrees and 14.5% of doctorate degrees [1]. This phenomenon, referred to as the *incredible shrinking pipeline* [2], leads to the under representation of women in the computing technologies causing a shortage of qualified professionals and the exclusion of women from participating in designing systems and products that satisfy the needs of all people. To produce industry's ideal hires, detailed studies are thus needed to investigate the reasons why women participate in this field at low rates [3]. Furthermore, actions to address this shortage are needed [3].

This paper summarizes current practices by Computer Science and Engineering (CS&E) departments in the U.S. that aim at recruiting and retaining women in graduate school. Publishing these practices will raise awareness among faculty about what they can do to improve the educational setting for female and minorities. This data was mostly collected at a Birds-of-a-Feather session organized by the authors at the 1997 Grace Hopper for Celebration for Women in Computing,

2. Positive Departmental Atmosphere

- Educating faculty on different learning styles and on achieving gender equality in the classroom.
- Encouraging informal study groups and team projects to foster opportunities for both male and female students to interact more closely. This may decrease women's sense of isolation, and give them a chance to build confidence in their technical abilities.
- Encouraging social activities, co-ed sports, etc., to enhance the sense of belonging and importance for everyone in the department.
- Active presentation and discussion of reports, at the departmental level that relate the status of women in science and engineering.
- Offering and publicizing interdepartmental courses on women in science and engineering.
- Conveying support for female faculty, staff, and students to spread positive attitudes by example.
- Sensitivity on the department's side in addressing student body by using language that includes both males and females.
- Open departmental support/appreciation for women special groups in the department and at the college, university, national, and international levels. Such support includes posting notices, post notices, advertising meetings, providing facilities, etc.

2. Role Models

- Recruiting, hiring, and retaining female faculty, and seeking female visiting faculty.
- Representation of women on working committees and in departmental seminars.
- Featuring news of women scientist and engineers.
- Inviting speakers that highlight the role of women in science/engineering

3. Support Groups

- Establishing E-mail discussion list among women students, faculty, and technical staff.
- Supporting informal/formal personal/technical gatherings on or off-campus by providing financial support and facilities.
- Designating a staff member or faculty that is committed to providing additional counseling/help to female students. The person must be approachable, knowledgeable, and willing to help and initiate new programs for women.
- Giving the female graduate students an opportunity to provide feedback regarding the department's success or shortcomings in providing a women-friendly environment.

4. Academic and Professional Support

- Creating tutoring programs targeting women
- Discussing possible career paths through job forums, resume workshops, career booklets, etc.
- Providing information on issues women face in seeking industrial and academic jobs, and in balancing technical careers with family life.
- Encouraging practice talks and mock interviews

5. Attracting & Supporting First Year Students

- Advertising of potential assistantships and of the department's female-friendly atmosphere.
- Inviting potential students to visit campus and creating a chance to meet and interact with female faculty and female students.
- Assigning new female students desks in offices that have other female students.
- Informing new students of support groups that exist in the department, and also at the college, university, and national level.
- Providing scholarships aimed at recruiting female graduate students.

6. Mentoring Opportunities

- Establishing a departmental mentoring program that pairs female students with more advanced students or faculty other than the academic advisor.
- Matching of female graduate students with women and men alumni in industry
- Inviting speakers to the formal or informal female graduate student gatherings.

7. Women with Family/Children

- Stopping the academic clock for new parents (student/faculty,male/female by birth or adoption).
- Giving a part-time enrollment option for student parents, or students with family obligations.
- Providing information and support for subsidized health care/insurance, family housing, and child care.
- Paid Maternity/Paternity leave.
- Facilities for student parents, such as a special office for parents and children (equipped with computer for student parent and toys, TV, video, etc. for children), and changing tables in men and women's bathrooms
- Providing special financial aid to single parents.
- Creating a student parents support group.
- Actively helping with two body problems (admission, if possible, career info/placement, etc.) .

8. Special Programs

- Seek funding opportunities to support special projects that aim at recruiting female students (programs for K-12, and undergraduates from other institutions).
- Providing courses for women with different backgrounds to prepare for applying to CS grad school

9. The Challenges Ahead

The practices summarized above reflect existing practices that aim to retain women in graduate school at some graduate Computer Science and Engineering departments. Several of the practices can be applied for recruiting and retaining minorities. However, thorough studies are needed to understand the impact of these techniques. Furthermore, longitudinal studies of environmental, cultural, and psychological reasons that prompt women to stay away or leave IT-related disciplines will ensure the continuity of some of these practices and the development of more effective ones.

References

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