

THE SLOAN GRADUATE EXPERIENCE PROJECT AT THE UNIVERSITY OF MICHIGAN

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The Sloan Graduate Experience Project at the University of Michigan is a comprehensive, university-wide initiative designed to recruit, retain, and foster the success of women engineering, physics, and chemistry graduate students at both the master's and the Ph.D. level. Funded by a grant from the Alfred P. Sloan Foundation, this is a 5-year collaborative effort of the Women in Science and Engineering Program; the College of Engineering; the College of Literature, Science and the Arts; the Rackham School of Graduate Studies; and the Center for the Education of Women.

It is hoped that the project will not only have a major impact on the culture and climate of the University of Michigan, but serve as a national model for other research universities where the majority of our future scientists, engineers, and faculty members are trained.

RATIONALE

The project encompasses the physical sciences and engineering programs because it is in these programs that women are most underrepresented. The focus of the project is on women at a critical point in their educational and career development. The graduate level represents an important milestone as it straddles a position between educational preparation and career path, making this an extremely interesting and important group with which to work. By attending to issues important to women at this stage in their work, we address both education and employment.

Most "women in science" and "women in engineering" programs focus on K-12 or undergraduate women, working to increase interest in science and engineering and to recruit women into programs. Programs of institutional change are less common. In contrast, the focus of this project is on retention as well as recruitment of graduate women, and on a strong emphasis for the need for permanent institutional change. Research, interventions, systemic institutional change, and evaluation are essential components of our program.

Usually, intervention efforts to assist underrepresented groups in graduate programs in science and engineering are housed in the graduate schools at universities, relying on administrative more than faculty commitment. Fellowships and scholarships are the primary benefit provided by most of these programs.¹ Recruitment and retention efforts are

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part of some current exemplary programs for underrepresented groups in science and engineering² but efforts at institutional change are far less common. Our proposed program aims to move from currently necessary but short-term interventions to more permanent institutional change. To accomplish this, we rely on the cooperation of a committed and institutionally stable change agent, the Center for the Education of Women, and those who truly shape the environment of physical science and engineering graduate studies--college and department administrators and faculty.

COMPONENTS OF THE PROJECT

The Graduate Experience Project has four major components: increasing the knowledge base on women in the physical sciences and engineering; programmatic interventions; systemic institutional change, and evaluation and national dissemination of the model.

I. INCREASING THE RESEARCH KNOWLEDGE BASE ON WOMEN IN THE PHYSICAL SCIENCES AND ENGINEERING

Research to investigate issues specific for women graduate students at the University of Michigan as well as to add to our general understanding of women in the sciences and engineering is an important basis for the Project, both in terms of informing the programmatic efforts as well as to document a broad range of factors effecting the cohort of graduate students participating during the grant period.

Research studies at the University of Michigan have illustrated several issues women face when pursuing a graduate degree in a nontraditional field such as engineering or the related fields in the physical sciences or mathematics. In one study, 53% of the women engineering master's students and 35% of the men were dissatisfied with the amount of mentoring they received. A third of women Ph.D. and master's students noted the lack of mentoring as a source of delays for them in their program. A third of the women Ph.D. and 19% of the master's engineering students reported that they have been "treated in such a way that they feel ridiculed or humiliated". Women and men engineers noted that there was little warmth, caring or personal support in their graduate program.³ Women who remained in mathematics and physics graduate departments, in contrast, talked about the friends in their departments with whom they have parties, play Frisbee, and found a social connectedness.⁴ Graduate students have also indicated a lack of necessary information on how to succeed in graduate school, such as how to design a research proposal or find a mentor.⁵

The research component of the Graduate Experience Project includes:

- A faculty survey of perceptions about women in science and engineering issues
- Graduate student focus groups to provide qualitative data
- Longitudinal data collection on the participating cohort of graduate students.

Currently, there is no campus-wide integration of data from the application process through degree completion making it difficult, if not impossible, to determine overall rates of attrition or the attrition at any given step in the educational pathway. The Graduate Experience Project will provide the first overall picture of the various points of entry, and

exit, in the graduate school educational pipeline at Michigan. Once this procedure is established, overall rates of retention and attrition will be routinely determined.

II. PROGRAMMATIC INTERVENTIONS

Programmatic interventions are designed to be responsive to needs elucidated by research efforts and thus may evolve during the life of the project. To date, they have included:

- Development of recruitment publications relevant to women
- Departmental presentations to sensitize faculty members involved in graduate student recruitment to the issues of “women-friendly” recruitment
- Orientation workshops/welcoming events for incoming women graduate students
- Establishment of a peer mentoring system whereby upper level women graduate students are trained and then serve a peer mentors to incoming first and second year women graduate students
- Presentation of a variety of group workshops focusing on how to negotiate the graduate school experience
- Support for the development of a graduate chapter of the Society of Women Engineers.

III. SYSTEMIC CHANGE

Because it is clear that individual, short-term, focused programs have only a temporary effect or at best, a limited efficacy, the grant has at its goal systemic institutional change, which is why the participation of many units and colleges across campus is so significant. By bringing together colleges and departments as diverse as the Center for the Education of Women and the College of Engineering, we hope to create a synthesis and consistency of effort which will effect permanent change. The Graduate Experience Project will include:

- Fostering “female-friendly” recruiting techniques
- Producing a series of trigger videotapes on climate issues
- Training selected faculty and staff members to be trainers for departmental workshops on climate and harassment issues
- Fostering effective pedagogical strategies
- Codifying departmental procedures and regulations
- Analyzing advising and mentoring strategies of various departments
- Identifying effective techniques as well as those less effective
- Establishing a best practice network

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- Establishing an incentive program for graduate departments to recruit and retain women by providing financial support.

IV. EVALUATION AND DISSEMINATION OF THE MODEL

No program, no matter how innovative or dynamic, is worthwhile without careful evaluation so that the effectiveness of the project can be analyzed. A comprehensive program evaluation, both formative and summative, will be undertaken during the life of the project and continue after the Sloan funding period. The cohort study will provide critical data on outcome measures including student satisfaction and program completion rates. Components of the Graduate Experience Project that are successful (including the videotapes) will be documented and disseminated through a variety of mechanisms, including journal articles, presentations at national and international meetings, and publication through electronic means.

During the last year of the project, data collection and analysis will be continued, as well as writing and publication of results.

CONCLUSION

The Graduate Project Experience represents a campus-wide, collaborative approach to addressing the issues for women graduate students in engineering and the physical sciences. It is our goal that the positive changes resulting from the Project be incorporated as integral and ongoing components of graduate education at the University of Michigan.

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