



WISP Alumnae Connections Survey Report on Undergraduate Research

Executive Summary

Major Findings Conclusions

In Fall 1997, the Women in Science Project (WISP) embarked on a major research effort, the Dartmouth Women in Science Alumnae Survey, as part of a broader Alumnae Connections initiative. The focus was on women in the twenty-four graduating classes of 1973 through 1996 who majored in science, math, and engineering while at Dartmouth. The three major research questions for the study were:

- Did these women persist in science after graduating from Dartmouth?
- What factors in their college experience encouraged or discouraged them in their pursuit of careers and advanced studies in the sciences?
- What recommendations do alumnae have to best prepare women in science?

The present report focuses on the parts of the Alumnae Connection (AC) survey data, which address the needs of the Dartmouth College Reaccreditation Subcommittee on Undergraduate Research. Findings address two of the questions:

- What is the quality of the undergraduates' experiences in the opportunities that currently exist and how might their quality be enhanced?
- Do such opportunities change the undergraduates' academic experience at Dartmouth, and if so, how?

External evaluation consultant, Dr. Cynthia Char, served as the principal investigator for the study.

Major Findings

A sizable proportion of respondents reported participation

in undergraduate research opportunities.

Of the 724 women who responded to the AC survey, 385 (53%) reported that they had participated in research opportunities as an undergraduate; 198 of these women were from the classes of 1990-96. Fifty-two women reported being a WISP intern (33% of respondents from the classes of '94-'96, the only classes in this study in which WISP first year internships were available).

Many women regarded research experiences as positively influencing their interest and desire to pursue a career in the sciences.

Respondents rated their undergraduate research opportunities quite favorably, with perceived levels of positive influence increasing gradually over the last three decades of Dartmouth classes. Evaluations of the respondents who participated in WISP internships were similarly positive.

Twenty-four percent of respondents spontaneously listed undergraduate research opportunities as one of the most significant aspects of their Dartmouth undergraduate experience, in enhancing their interest and/or desire to pursue further studies or a career in the sciences. Women discussed the value of apprenticing with a faculty member as a research assistant/intern, as well as of conducting one's own independent research, such as doing a senior thesis. Women discussed a range of benefits received from engaging in research opportunities, such as acquiring an interest in and commitment to doing research, increased understanding of the real world applications of science, and a sense of belonging to a scientific community.

A small number of women regarded research opportunities, or lack thereof, as having an adverse effect on their interest and desire to pursue a career in the sciences.

About 5% spontaneously listed undergraduate research opportunities, or lack thereof, as one of the most significant aspects in diminishing their interest and/or desire to pursue further studies or a career in science. Almost half of these responses indicated the positive value of a research experience. They felt it informed their career decisions not to go into a research field but rather redirected their science focus. They wished that research had been required of them as an undergraduate, or expressed a desire that there had been a greater number of research opportunities available, either in general, or in their particular major.

More critical responses concerned women's view that the process of obtaining a research opportunity was too highly selective and competitive, expressing disappointment of having been rejected as a research intern or assistant. Others felt that the range of research opportunities had been too narrow and heavily skewed towards academic research and medicine.

Women who participated in WISP first year internships were more likely to report having participated in research opportunities, more generally.

Of the 52 women who reported taking part in WISP internships, 50 reported general research opportunities as well. A number of women described how they continued to conduct research with their WISP sponsor beyond their first year, or how the WISP internship was the first of a number of different research opportunities they participated in.

Women who participated in undergraduate research opportunities were more likely to report having a mentor in science while in college.

Women participating in undergraduate research opportunities more generally, and in WISP internships more specifically, were more likely to report having a mentor in science than their peers who had not participated in research. Respondents described many specific ways they felt mentors had offered support and guidance, such as overseeing their thesis work, providing encouragement and advice, helping with professional networking, providing positive role models, and recognizing potential in their students.

Women who participated in undergraduate research opportunities were more likely to go on and obtain doctoral degrees, than their counterparts who did not participate in undergraduate research opportunities.

Women who participated in undergraduate research opportunities were more likely to remain in a career in the sciences.

Of the 469 women who reported current/most recent employment in the science field, almost 60% had participated in undergraduate research opportunities. For the women who are not currently employed in a science field, about 35% had participated in undergraduate research opportunities.

Undergraduate research opportunities were cited by women as one of the most important program initiatives for Dartmouth to prepare their undergraduate women for a career in the sciences.

When asked for the one recommendation they would make to Dartmouth College to best prepare their female undergraduates for a career in the sciences, 12% specifically mentioned the provision of undergraduate research. More specifically, women recommended that:

- It is essential to provide undergraduate research opportunities to students interested in careers in the sciences, to afford a realistic sense of future fields and positions, and to build skills, knowledge and experience that are critical to graduate study and future careers in science.

- Research opportunities should be available early on in one's undergraduate career. At the same time, research opportunities should be made available throughout various points in one's college years, either to build upon previous research experiences, or to newly enter the research field.
- Having a mentoring relationship with a faculty member and feeling part of a scientific research community constitute important parts of research opportunities.
- The types of research opportunities available should be expanded beyond academic scientific research and positions in medicine, into positions in industry, business, education and other fields.

Conclusions

The Alumnae Connections survey provides strong data that clearly supports the value of providing research opportunities to undergraduates. Alumnae majoring in the sciences rated such experiences as positively enhancing their interest and desire to pursue a career in the sciences, and described many of the benefits they felt they received through these experiences, particularly by acquiring a strong mentoring relationship with a faculty member. These views were further supported by the statistically significant relationship that undergraduate research opportunities increased the likelihood of obtaining an advanced doctoral degree, as well as increasing the likelihood that they would remain in careers in the field of science.

Given the clear benefits of research experiences, these findings suggest that the College should consider ways it can increase the numbers and kinds of research opportunities that might be made available, and the range of students addressed. Formal faculty research internships should be considered as part of the larger array of other out-of-classroom learning opportunities and internships, in greater coordination with academic advising and career counseling and placement. In this way, greater numbers and kinds of students can best be served, so that research and other out-of-classroom learning opportunities are not reserved for the "best and brightest". Rather, such opportunities should be made widely available to serve as many of Dartmouth's promising undergraduates as possible, introducing them to interesting and diverse ways of thinking, learning, and working with colleagues, and serving as important avenues to exciting future careers.