

UNH UNBIASED: NSF ADVANCE Institutional Transformation Social Science Study

INTRODUCTION

The climate study conducted in 2008 and the analysis of institutional data conducted under the UNH NSF ADVANCE PAID project (2009-2012) have significantly deepened our self-knowledge about the employment of and climate for women in the STEM disciplines at UNH. Both sources of data provide strong evidence of the need for institutional change if UNH is to provide an unbiased climate where faculty can thrive irrespective of gender. Further, the data clearly indicate that transforming UNH must begin at the department level with initiatives targeted at ameliorating the climate for women faculty and the influence they have on department level decisions.

Guided by the above knowledge, one of the initiatives in this proposal involves developing a world-class professional development program to sensitize department chairs about the influence that individuals' implicit assumptions have on the decisions they make and on the way they behave toward others. Department chairs will receive training to overcome the influence of their own implicit assumptions on their department's hiring and promotion processes and decisions and their behaviors vis-à-vis their faculty. The objective of this social science study is to determine what, if any, impact the department chairs professional development initiative will have on employment and climate in their departments. In order to preserve anonymity, departments will be grouped by college. The following describes the hypotheses to be tested and the quasi-experimental design to be used in this study to examine the effect of the department chair professional development initiative on faculty climate and employment data.

CURRENT SITUATION AT UNH

The findings of the UNH climate study were largely consistent with the findings of the national surveys conducted and reported by the National Research Council of the National Academies (2010). No significant gender difference was found in UNH faculty reports of job satisfaction, productivity, time spend on research, teaching, and service, and resource availability. As in other national institutions, the challenge for women faculty at UNH resides at the department-level and is reflected, not only in the underrepresentation of women STEM faculty at UNH, but also in gender differences in individuals' beliefs that they can influence departmental decisions and in various aspects of perceived climate.

The UNH climate study revealed a significant gender difference in STEM faculty members' beliefs that women are less likely than men to have influence in department politics and administration. Forty one percent of women STEM faculty and only 7% of men STEM faculty believed this to be true. Further, there was a significant gender difference in faculty members' beliefs that they can voice their opinions openly in their departments (means = 5.04 for men STEM faculty and 4.26 for women STEM faculty, on a scale from 1 to 6). In terms of leadership, 66% of women STEM faculty, and only 13% of men STEM faculty, agreed that their department has too few women in leadership positions, revealing that, while the number of women in leadership positions is low, one third of women and almost 90% of men do not see this as a problem. Further, 35% of women STEM faculty and only 13% of men STEM faculty

disagree that their department has made an effort to promote women. With respect to service, while both women and men STEM faculty believe that they do a great deal of service that is not formally recognized by their department, again, the number is higher for women STEM faculty (68%) than it is for men STEM faculty (43.5%). As a further sign that some female faculty members may find themselves outside the circle of influence, significantly more women STEM faculty (15%) disagree that they understand the criteria for achieving promotion and tenure than men STEM faculty (6.5%).

There are significant gender differences in beliefs regarding the climate for women in STEM at UNH. For example, a full 23% of women STEM faculty agreed that sex discrimination and harassment are a problem in their department, while only 7% of men STEM faculty believe this to be true. One third of women STEM faculty (and 13% of men STEM faculty) disagree that their department has taken steps to enhance the climate for women. These findings of the 2008 climate study support the notion that there are department level climate problems for women in STEM at UNH, and that a majority of men are not aware that there is an issue.

Institutional data indicate that at UNH, women faculty are underrepresented in all areas and at every rank with the exception of the College of Health and Human Services. For example, women comprise only 19% of the tenure track faculty in STEM and 44% in Non-STEM. Among tenure track STEM faculty, 58% of men and 25% of women are tenured full professors; 29% of men and 52% of women are tenured associate professors; and 13% of men and 23% of women are untenured assistant professors. Further, on average, men have stayed at UNH longer than women in almost every department and, in relative terms, UNH loses more women than men since the average m/f ratio is lower for the attrition data than the ratio overall. Attrition patterns from 2004 through 2010 indicate that if the current trend continues, the m/f ratio will only increase over time. Most men have left UNH at the full professor rank while most women have left at the associate or assistant professor rank. The m/f ratio is about 13% higher at UNH than at 4-year public U.S. schools on average, and 55% higher at the full professor rank, 11% lower at the associate professor rank, and 0.5% lower at the assistant professor rank. These national comparisons show that UNH lags behind comparator institutions in terms of the representation of women at senior ranks.

Baseline measures of employment and climate study data will be repeated at the outset of the IT ADVANCE project. At that time, we hypothesize that the conditions described above and based on the 2008 climate study and 2010 institutional data will still exist:

Hypothesis 1: There will continue to be a significant gender difference in baseline measures of perceived departmental level climate and degree of influence such that women STEM faculty will perceive a more negative climate and less ability to influence departmental decisions than men STEM faculty.

Hypothesis 2: Baseline institutional data will continue to reveal significantly higher male/female ratios in every college (except HHS), at senior ranks, and compared to national averages.

TREATMENT

The treatment examined in this study consists of initiative 2.1 described in the proposal - department chair professional development aimed at helping them to understanding the effect of individuals' unconscious biases and implicit assumptions on decision making and behavior.

Department chairs will receive training on overcoming their own implicit biases in hiring and promotion decisions and on their behavior toward the faculty in their departments, especially as it relates to ensuring that everyone has equal voice and enforcing a no tolerance policy on harassment and discrimination. The objective is that the training will result in improved climate and representation of women in the STEM disciplines at UNH. Thus, we hypothesize as follows:

Hypothesis 3: There will be no significant gender difference in faculty's perceived departmental level climate and degree of influence subsequent to the implementation of department chair professional development programs.

Hypothesis 4: There will be a significant reduction in male/female ratios in the STEM disciplines and at senior ranks subsequent to the implementation of department chair professional development programs.

METHODOLOGY

Experimental Design

The purpose of this study is to determine whether the department chairs professional development programs will impact or cause a change in climate and employment data for women STEM faculty. The experiment is the only research method that allows conclusions as to causality and can determine whether interventions are producing the desired effects. A carefully designed quasi experiment is an acceptable alternative to the randomized experimental design when conducting a study in the field to maintain realism, or where random assignment to groups is either impossible or impractical (Kidder & Judd, 1986). In order to maintain the realism of this study, the combination of 'pretest-posttest nonequivalent control group' and 'interrupted time-series' quasi-experimental depicted in Table 1 will be used.

In order to control for the impact of events external to the quasi-experiment, department chairs will be grouped by college(s) in groups of 15 to 16. We will collect climate survey and institutional data for all faculty and compare outcomes for faculty with chairs that have received training to faculty with chairs that have not received training. Chair participation will be mandated by the college deans who will have previously participated in the same professional development class in order to increase their understanding of and support for the initiative and to encourage them to monitor and encourage changes in each of their colleges. Treatments will be staggered over time by group, thus creating control groups of all faculty in the departments of chairs that have not yet received the treatment to use as comparison groups for post-treatment effects. Support for the hypotheses regarding whether the treatment has caused any subsequent changes would be indicated by a change in the treated group but not in the control group(s). Continuing observations longitudinally for both the treated and the control groups will provide an indication of the sustainability of any effect.

Pre- and post-treatment observations consist of a combination of faculty climate surveys and analysis of annual institutional data. Survey questions will include demographics, general employment data and climate and influence measurement scales, two of the conditions targeted for improvement by this project.

DATA ANALYSIS

The data will be analyzed using multivariate analysis of variance to determine whether there is a significant difference between the treated and untreated groups. Repeated measures analysis will be used to analyze changes over time.

RESULTS

The objective is to determine whether initiatives aimed at supporting women faculty in the STEM disciplines are having the desired effect by focusing on a common method, the training of department chairs. Whether or not the results support the hypotheses of significant impact will be very informative, especially as it regards the efficacy of the substantial sums invested in such initiatives across the country.

CAPABILITY

The social science study aspect of this project will be led by Christine M. Shea, Professor of Technology and Operations Management and currently Associate Dean of Graduate Programs and Research at the Whittemore School of Business and Economics. Professor Shea's PhD is in Business Administration with concentrations in Organizational Behavior and Operations Management. She has extensive experience in experimental design and has published four papers in management journals based on her experimental research on the effect of leadership on performance over time. Her areas of expertise are in the areas of leadership, championship, and technological innovation in organizations, and she has been an avid scholar of organizational effectiveness for over 30 years.

References – see full citation list

Table 1
Quasi-experimental Design

Group (Colleges)	Number of Department Chairs	October Year 1		October Year 2		October Year 3		October Year 4	October Year 5
		Observations*	Treatment 1	Observations	Treatment 2	Observations	Treatment 3	Observations	Observations
1 (CEPS, COLSA, EOS)	15	O	DCPD	O	-	O	-	O	O
2 (CHHS, WSBE, UNHM)	15	O	-	O	DCPD	O	-	O	O
3 (COLA)	16	O	-	O	-	O	DCPD	O	O

Abbreviations: O = observation; DCPD = Department Chair Professional Development; CEPS = College of Engineering and Physical Sciences; COLSA= College of Life Science and Agriculture; EOS = Earth, Oceans and Space; CHHS = College of Health and Human Services; WSBE = Whittemore School of Business and Economics; UNHM = University of New Hampshire at Manchester; COLA = College of Liberal Arts.

* Observations are from climate study of faculty in each of the departments or about 50 per college, on average, as well as institutional data. The 2008 climate study will be used in developing the questionnaire to maximize the response rate.