UNH UNBIASED: Leadership Development and Policy Change to Promote Institutional Transformation

1. Introduction

The University of New Hampshire (UNH) proposes to initiate sustainable institutional transformation with the overall goal of increasing the number, retention, and success of women faculty, primarily but not solely in the STEM disciplines, by empowering them to succeed and establishing quick-action ability for retention. Several recent institution-wide initiatives provide strong evidence that UNH is ready to undergo institutional transformation in this critical area. In 2010, UNH's President Mark Huddleston introduced a bold strategic plan that charts the institution's future over the decade. The new plan presents a vision of UNH in 2020 built upon requisites for change and initiatives for investment that are intended to shift the culture and ensure continued success. One such investment area is inclusive excellence, with a particular focus on broadening participation in the STEM disciplines. Building on this focus, a state-wide summit "Broadening Participation in the STEM Disciplines" occurred in June 2011 in collaboration with the NSF EPSCoR office, featuring keynote speaker, Dr. Muriel Poston.

To bring these larger initiatives (and the strategic plan) to life, the University invested in and provides programmatic support for new and currently successful faculty development programs focusing on inclusive excellence, promotion and tenure, curricular change, advancing individual scholarship through external funding, and advancing interdisciplinary research teams. Key to the UNH ADVANCE IT effort, these programs are lead by the Provost's Office and include: (1) a faculty development and mentoring program for junior faculty established in 2008 and expanded in 2010 which now includes a program for deans and department chairpersons, (2) a series of seven workshops for cohort-based faculty development learning communities that builds on successes of the *Engaged Scholars Academy established in 2004 (*Abrams et al., 2006*)* to the more recently established (2010) *Research and Engagement Academy,* (3) year-long topic-based learning communities for faculty in the STEM disciplines including the *sustainable ecosystems learning community* and the *NSF EARLY CAREER learning community*, and others for non-STEM disciplines in the humanities, social and behavioral sciences and for librarians (4) a research leveraging program (2010) that funds interdisciplinary teams of faculty primarily in the STEM disciplines*,* and (5) a successful cluster hire of eight new faculty in the College of Life Sciences and Agriculture that has the potential to serve as a model for future cluster hires at UNH. In early 2011, the Provost and ADVANCE IT PI, John Aber, initiated an institutional review of promotion and tenure guidelines with the aim of increasing consistency, fairness, and transparency. In addition, in January 2011, UNH ADVANCE IT Co-I, Dr. Samuel Mukasa was appointed Dean of the College of Engineering and Physical Sciences, UNH's largest science college. Dean Mukasa has previous experience with the ADVANCE program at the University of Michigan and has set a goal of creating the most gender-balanced college in the University for both tenure track and research faculty.

The UNH ADVANCE IT program will be guided conceptually by the congruence model (Tushman & O'Reilly, 2002), a systems view of the organization that takes into account context, processes, people, culture, and structure in diagnosing and correcting causes of suboptimal organizational outcomes. We have taken into consideration the work we completed and the institutional knowledge we gained under the UNH ADVANCE PAID grant, as well as the work of previous IT institutions as reported in Bilimoria et al. (2008) in designing our institutional transformation process. With NSF support through an ADVANCE PAID Grant (see Section 4 for detailed discussion), we have significantly strengthened the UNH Faculty Mentoring and Professional Development Program and implemented a partnership program between tenure-track and research faculty to enhance each partner's ability to balance teaching and research. In addition to meeting the goals of the PAID grant, we have conducted an in-depth analysis of

the 2008 faculty climate study and historical institutional data. The analysis points to the need for change in specific areas at UNH. We are now ready for a permanent transition to the next level.

2. Overview of Goals and Initiatives

The goals and initiatives described in this proposal emerged from the analysis of University climate and institutional data and are informed by NSF's goals for the ADVANCE IT program and the results of ADVANCE IT initiatives at other institutions (Bilimoria et al., 2008). We plan to initiate the sustainable transformation of policies, procedures, and practices at UNH to enable and require unbiased faculty recruiting, hiring, and advancement. The specific goals for the UNH ADVANCE IT are to:

1. Increase STEM faculty women representation at all ranks through changes in recruitment and retention policies and practices;
2. Improve support and department level climate for STEM faculty women by increasing awareness and knowledge, department chair professional development and assessments, and establishing formal mentoring policies;
3. Conduct a wage equity analysis and recommend any policy changes that might be indicated;
4. Develop more flexible workplace policies to support career advancement for STEM faculty women; and
5. Create and maintain campus-wide awareness of the issues addressed and policy changes made under this IT initiative.

Working towards the above goals, we will transform UNH into a university that exemplifies inclusive excellence for all its faculty and staff through a series of specific initiatives that are described in more detail in Section 6b.

3. Institutional Context and Data

UNH is classified by the Carnegie Foundation as a high research activity, community engaged university. It has 621 full-time and 387 part-time faculty and 14,469 undergraduate and graduate students. The University is also designated as a land-, sea- and space-grant university with three campuses in different areas of the state. The main campus is located in Durham and two more urban campuses are located in Manchester and Concord. UNH is part of the University System of New Hampshire that includes three additional campuses, Plymouth State University and Keene and Granite State Colleges, all serving a mainly rural population. The UNH main campus is comprised of six schools and colleges with the majority of the STEM departments and programs housed in the College of Engineering and Physical Sciences (CEPS) and the College of Life Sciences and Agriculture (COLSA). UNH is also home to two research institutes, the Institute for the Study of Earth, Oceans and Space (EOS) and the Carsey Institute, focused on youth, family and communities, that in conjunction with the schools and colleges, help to carry out UNH's teaching, research, and engagement missions.

Analysis of UNH institutional data guided by the ADVANCE Indicators toolkit and results of the 2008 climate study have significantly deepened our self-knowledge about the employment of and climate for women in the STEM disciplines. Current employment data show that women are underrepresented in all areas and at every rank with the exception of the College of Health and Human Services (i.e., women comprise 19% of the tenure track faculty in STEM and 44% in non-STEM). Most of the women STEM faculty are at the middle and lower ranks (i.e., 25% are full professors, 52% are associate professors and 23% are assistant professors), while most male STEM faculty are at the full professor rank (i.e., 58% are full professors, 29% are associate professors, and 13% are untenured assistant professors. The male/female (m/f) ratio at UNH is 1.65 overall, 3.64 in STEM, and 1.11 in non-STEM. UNH has both an

academic and a research faculty track. The 619 (2010 data) academic faculty members, 33.9% of whom are in the STEM fields, are represented by the AAUP, whereas the approximately 56 (in 2010) research and 38 clinical (in 2010) faculty (with 86% of research faculty and 26% of clinical faculty in STEM fields) are not.

Table 1. Percent of women in each faculty category by college affiliation,2010. Colleges and Institutes are defined as follows: COLSA: College of Life Science and Agriculture, CEPS (College of Engineering and Physical Sciences), EOS: Institute for the Study of Earth, Oceans and Space, WSBE: Whittemore School of Business and Economics, HHS: College of Health and Human Services, COLA: College of Liberal Arts, Thompson Sch: Thompson School of Applied Science, UNHM – University of New Hampshire Manchester Campus.

	Tenure Track Faculty			*T-track faculty total**	*Instruc-tional*	*Research (R)*	*Clinical (C)*	*R and C total*	*Grand TOTAL*
	Full	*Assoc*	*Asst*						
COLSA	*10.2*	*36.0*	*40.0*	*20.3*	*0.0*	*25.0*	*80.0*	*50.0*	*26.7*
CEPS	*8.3*	*26.7*	*26.9*	*18.3*	*0.0*	*0.0*	*0.0*	*0.0*	*17.8*
EOS	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*21.2*	*0.0*	*21.2*	*21.2*
TOTAL STEM	***9.2***	***30.0***	***29.0***	***19.0***	***0.0***	***20.8***	***80.0***	***31.0***	***21.6***
WSBE	*12.5*	*29.6*	*42.9*	*29.7*	*100.0*	*0.0*	*0.0*	*0.0*	*30.8*
HHS	*10.0*	*64.7*	*59.3*	*54.9*	*100.0*	*0.0*	*92.3*	*88.9*	*64.6*
COLA	*35.3*	*49.5*	*72.7*	*47.5*	*0.0*	*71.4*	*50.0*	*66.7*	*48.3*
Thompson Sch.	*8.3*	*42.9*	*0.0*	*20.0*	*0.0*	*0.0*	*0.0*	*0.0*	*20.0*
UNHM	*16.7*	*33.3*	*66.7*	*36.7*	*0.0*	*0.0*	*0.0*	*0.0*	*36.7*
TOTAL NON-STEM	***27.1***	***47.9***	***60.2***	***44.0***	***100.0***	***62.5***	***89.3***	***83.3***	***47.4***
UNH total (w/o Library)	*18.9*	*43.1*	*52.1*	*35.5*	*66.7*	*26.8*	*86.8*	*51.1*	*37.7*
Library	*66.7*	*78.6*	*50.0*	*71.4*	*0.0*	*0.0*	*0.0*	*0.0*	*71.4*
UNH (with Library)	*19.5*	*44.9*	*52.0*	*36.7*	*66.7*	*26.8*	*86.8*	*51.1*	*38.7*

A reduction in m/f ratios from 2008 through 2010 indicates some, but insufficient, improvement primarily at the lower ranks. During that period, the m/f ratio in STEM decreased from 4.64 to 4.25 due to a substantial decrease in the m/f ratio at the assistant professor rank. At the full and associate professor ranks, the m/f ratio remained unchanged. During the same period, non-STEM faculty at the full professor level experienced the largest increase in m/f ratio, from 2.37 to 2.69, while the m/f ratios at other ranks decreased slightly.

Attrition patterns from 2004 through 2010 indicate that on average, men stay at UNH longer than women do. Further, more women leave UNH from colleges where the m/f ratio is already lower than the overall ratio. If this trend continues, the m/f ratio will increase over time. The data show, of the 120 men who left UNH during this period, 46% of them left UNH at the full professor rank, 27% left at the associate professor rank, and 27% left at the assistant professor rank. However, of the 72 women who left, only 30% left at the full professor rank, 35% left at the associate professor rank, and 35% left at the assistant professor rank.

National comparisons show that UNH m/f ratios lag behind comparator institutions, especially at senior ranks. The overall m/f ratio is about 13% higher at UNH than the average ratio for 4-year public U.S. schools, 55% higher at the full professor rank, 11% lower at the associate professor rank, and 0.5% lower at the assistant professor rank. Statistics from the Integrated Postsecondary Education Data System (IPEDS) for land grant and New England institutions reflect similar patterns.

Together, the above institutional data strongly support the need to take corrective action to transform UNH into an institution that is capable of recruiting, retaining, and promoting women in the STEM disciplines without bias. Findings from a 2008 faculty survey uncovered gender differences in perceived climate at UNH that are largely consistent with the findings of national surveys conducted and reported by the National Research Council of the National Academies (2010). There was similarity in areas where no significant gender difference existed. For example, men and women faculty at UNH report similar levels of job satisfaction, productivity, time spent on research, teaching, and service, and resource availability. The UNH climate study findings also supported the national survey finding that women are more likely to have mentors than men (73.3% of women vs. 57.8% of men). Consistent with the national results, the challenge for women at UNH resides squarely at the department level.

In the STEM disciplines at UNH, male faculty agreed significantly more strongly than women faculty that they can voice their opinions openly in their departments (5.04 vs. 4.26 on a scale from 1 to 6). Further, while 41% of women faculty believe that women are less likely than men to be able to influence department policies and administration, only 7% of men believe this to be true, supporting the notion that gender bias is insidious. Less influence may be accompanied by a lack of information, as indicated by the finding that significantly more female faculty members did not understand the criteria for achieving promotion and tenure (15% vs. 6.5%, respectively). Roughly two-thirds of women STEM faculty (68%) compared to 46% of men STEM faculty believed that they do a great deal of service that is not formally recognized. Women in STEM felt more strongly than all other UNH faculty that some of their service is not formally recognized. A further distressing finding of the climate study is that a full 23% of female STEM faculty at UNH agreed that sex discrimination and harassment are a problem in their department – whereas only 7% of male STEM faculty agreed. In addition, roughly one-third of women STEM and non-STEM faculty (and only 13% of men STEM faculty and 7% of men non-STEM faculty) believed that their department has not taken steps to enhance the climate for women; 66% of women STEM faculty (and only 13% of men STEM faculty) believed that their department has too few women in leadership positions; and 35% of women STEM faculty (and only 13% of men STEM faculty) believed that their department has made no effort to promote women. Thus, the 2008 climate study clearly points to uncomfortable circumstances for women faculty in STEM at the departmental level, and that appears to translate into a perceived lack of influence in department level decisions and discrimination and harassment towards some women with the issue being largely invisible to men.

4. Results from Previous NSF Funding: UNH ADVANCE PAID Program

In September of 2009, UNH was awarded an ADVANCE-PAID grant, "Enhancing and Advancing the Scholarship of STEM Women Faculty at the University of New Hampshire". Based on an analysis of the 2008 climate study implemented by the university, the goals of this program were developed around female STEM faculty. Specifically they were to:

1. Facilitate women STEM faculty's ability to advance successfully through their careers as leaders in research and teaching.
2. Increase women STEM faculty's capacity to influence policy and decisions at the institutional and national levels.
3. Increase women STEM faculty satisfaction with resources and research support; minimize feelings of isolation amongst women STEM faculty.
4. Increase women STEM faculty satisfaction with faculty colleagues, deans and chairs who mentor them.

These goals were approached through several key initiatives, four of which are highlighted below:

The Karen Von Damm Leadership Development Grant: This is a competitive grant to advance female-faculty by supporting course release to pursue opportunities for leadership either on campus at UNH or elsewhere in their discipline. It is named in honor of Karen Von Damm, a former professor of Earth Sciences at UNH, was an international leader in geochemistry of hydrothermal vents until her passing in August 2008. She was also a role model for marine geoscientists (a largely male-dominated field) and a leader in women's rights at UNH. This program will be sustained beyond the lifetime of the ADVANCE PAID grant through a generous endowment by Mrs. Louise Von Damm, Karen's mother, who was impressed with UNH's and NSF's commitment to honoring her daughter's services to advancing female scientists.

"ADVANCing Your Career at UNH and Beyond" Program: This program is a professional development curriculum designed to target faculty primarily at the associate professor level. It comprises four workshops focused on setting goals, developing negotiation skills, navigating academia, and networking. Participants have reported that the workshops encouraged them to take actions that are likely to have a positive impact on their career advancement, such as speaking with senior colleagues about strategies for advancement, finding mentors, and establishing steps and a timeline for specific career goals. This program was developed in collaboration with the Vice Provost for Faculty Development and Inclusive Excellence (Co-I Wanda Mitchell). The developed curriculum will be incorporated into the Faculty Mentoring and Professional Development Program (FMPDP) as part of the continuing offerings.

The University of Michigan's Center for Research on Teaching and Learning Players (CRTL Players): In an effort to build UNH's capacity for professional development, the ADVANCE PAID program will bring the CRTL Players to campus in March 2012. This is collaborative effort among the PAID program, the FMPDP, and the UNH Department of Theatre and Dance. Two workshops will be offered to faculty, one targeting female STEM faculty and another specifically for department chairs. A second day of workshops will be directed at Professor of Theatre David Kaye and his students to foster the professional development of UNH-based scholars in theatre.

Collaborative Scholarship Advancement Awards (CSAA): The CSAA supports PAID program's third goal to increase STEM women faculty's satisfaction with resources and research support and to minimize feelings of research isolation among the female STEM faculty. These awards support collaborations between tenure-track and research faculty in an integrated research and teaching effort. Following an effective launch in Year 1, Year 2 attracted an increased number of CSAA applications, and the new awards are expected to continue the success of the CSAA. Although the two-year grant period for Year 1 awards is only just ending, award recipients have already reported several positive outcomes. The awards provided them the opportunity to pursue research they would not otherwise have been able to pursue. It was a catalyst for working with a new research partner. Awardees felt more integrated into a research community at UNH and they expect the supported research to lead to grant applications and multiple publications.

The successes we have experienced with the initiatives launched under the PAID program have laid the foundation and provided the momentum for continued change at UNH.

5. Institutional Commitment and Sustainability

Provost Aber has signaled his commitment to the goals of the UNH ADVANCE IT program by agreeing to be the PI. Other key administrators, Vice Provost for Faculty Development and Inclusive Excellence, Dr. Wanda Mitchell, and Dean of the College of Engineering and Physical Sciences, Dr. Samuel Mukasa, have agreed to take active roles as Co-Is. Support and commitment to the ADVANCE ideals are reflected in several current and previous efforts. Even before the PAID grant was awarded, the Office of the

Provost supported the climate study that became the foundation of the UNH PAID program initiatives. This climate study has also become one of the cornerstones of this IT proposal and is a critical piece in the development of our social science study and plan for institutional transformation. The Office of the Provost has provided funds for several of the PAID initiatives including the Collaborative Scholarship Advancement Awards and salary support for several of the key ADVANCE PAID faculty leaders. This support has been committed past the end of the current PAID award.

While acknowledging the commitment of key administrators, we recognize that achieving faculty diversity, particularly with minorities and women, is an institutional challenge. We continue to lag behind other institutions, especially in the STEM areas. In response to this concern, the Office of the Provost currently provides institutional funding to support faculty development and grants to enhance faculty creativity and productivity. The Vice Provost for Faculty Development and Inclusive Excellence has a 100% appointment and is supported by a faculty fellow who assists in the planning and administration of the Faculty Mentoring and Professional Development Program. This program has an operational budget to support guest speakers, educational materials, website, program surveying, luncheons for both junior faculty and department chairs, opening academic year retreat for academic leaders, and afternoon seminars for both junior and senior faculty and academic administrators.

A number of other programs with the Office of the Provost provide further evidence of institutional commitment to faculty development. A Faculty Development Grant Program and a Faculty Scholars Program support the acquisition of new skills and scholarly activity. The Senior Vice Provost for Engagement leads and oversees the Engaged Scholars Academy and a Research and Engagement Academy. These academies offer a collection of programs with over 100 faculty participants each year.

In summary, the proposed ADVANCE IT program will strengthen the University's efforts to develop a strong and diverse faculty and is critical to UNH's academic mission of providing an educational environment that advances learning while fostering multiple perspectives. UNH will continue to build an inclusive community by providing support programs for new and diverse faculty, clearly articulating expectations by improving the departmental and campus climate, and by making certain that new and continuing faculty are able to successfully navigate the institution's polices, procedures, and practices. These are desirable outcomes, and UNH President Mark Huddleston and Provost John Aber are committed to sustaining these outcomes by providing a structure, resources, and leadership to build upon current initiatives and to enhance future practices. Specific investments include half time support of the ADVANCE Faculty Director and program support assistant for five years beyond the end of NSF funding as well as commitment to fundraising in support of ADVANCE initiatives. (Please see letters of commitment from President Huddleston and other key Deans/Director and Department Chairs in the Supplementary Documents.)

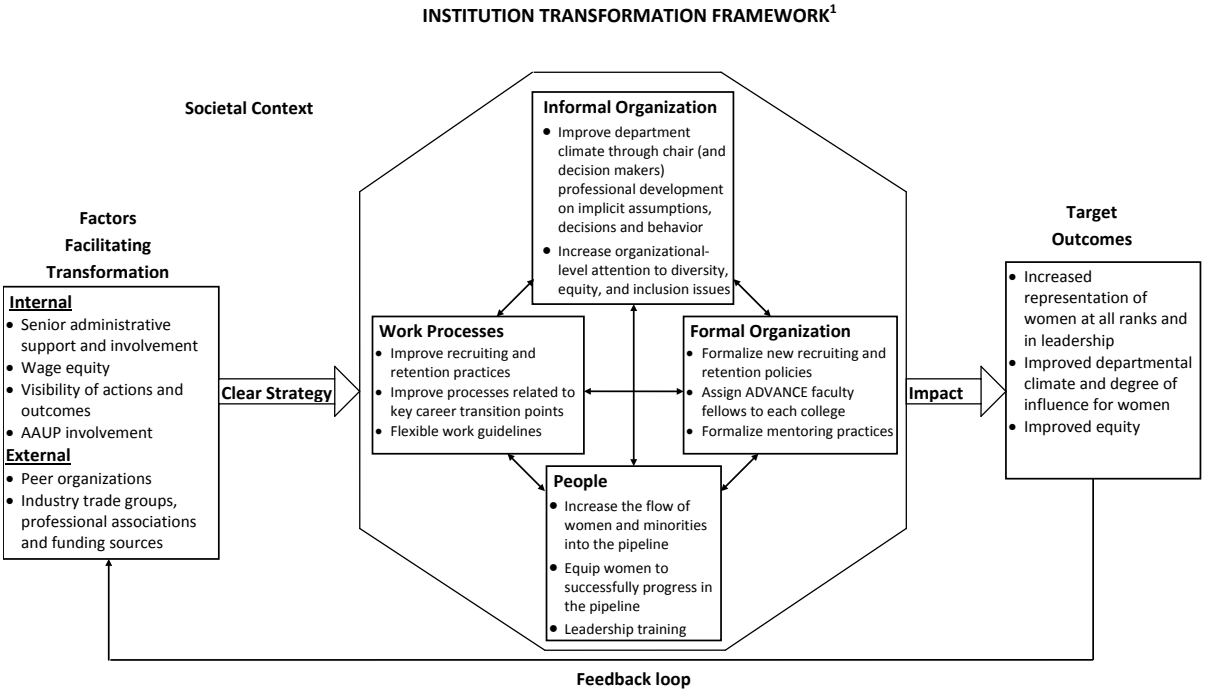
6. Conceptual Framework and ADVANCE IT Activities Description

6. a. Organizing Framework

Our organizing framework is based on a view of the organization as an open system that is influenced by and, in turn, influences the environment within which it exists. Its interrelated components transform inputs into outputs and other direct and indirect outcomes. The organizational management scholars Nadler and Tushman (1980) have provided a widely used congruence model as a guiding framework for diagnosing cause and effect relationships within both the formal (e.g., structure and formal policies and procedures) and informal (e.g., culture and climate) realms when addressing organizational outcomes that do not rise to desirable standards (Tushman and O'Reilly, 2002).

In this project, we have used the congruence model to diagnose relevant and interrelated factors that bear upon the underrepresentation of women and minorities at all ranks and in leadership positions at UNH and issues related to department level climate equity for women at UNH (see left hand side of the model in Figure 1). Guided by the accomplishments of prior NSF ADVANCE IT programs elsewhere as described in Bilimoria et al. (2008), we identified work processes, informal and formal organization characteristics, and people that are relevant to achieving the goals. These factors appear in the model and guide the initiatives proposed here.

Figure 1. Congruence Model Framework



[1]The institutional diagnosis and change framework is based on the widely researched Congruence Model (Tushman and O'Reilly, 2002) and the Model of Organizational Transformation for Enhanced Representation and Inclusion of Women and Minority Groups (Bilimoria, Joy, and Liang (2008)

6.b. UNH ADVANCE IT Goals and Initiatives for Transformation:

From the analysis we have completed as part of our PAID program, we have determined that for institutional transformation we must focus on change at the departmental level through changes in recruitment, promotion policies and practice. Furthermore, this transformation in both policy and climate will occur only if we communicate these findings to the broader UNH community and build awareness so that corrective action can be taken. In this section we describe a series of initiatives for each of our five primary goals. Initial policy changes outlined under specific goals include

1. Mandatory training for all faculty prior to being appointed on search committees (Goal 1).
2. Written guidelines for promotion and tenure for faculty (including research, clinical and extension) in all departments including mentoring plans (Goal 1).
3. Mandatory department chair and center director training (Goal 2).
4. Mandatory faculty development and mentoring programs for all new faculty (Goal 2).

5. Regular analysis of wage equity at the University (Goal 3).

6. Development of policies to support more flexible workplace focusing initially on family leave and its impact on tenure and child and elder care access (Goal 4).

Goal 1. Increase the representation of STEM faculty women at all ranks through changes in recruitment and retention policies and practices.

We will significantly affect the approach to recruitment of new faculty at UNH through changes in search committee preparation and practices when the search commences on campus. When departments and colleges are approved for faculty hires, we will be positioned to ensure that the hiring practices are without bias. Several initiatives based on successes at other ADVANCE institutions (e.g. University of Michigan's STRIDE program) will allow us to implement significant changes in recruitment policies at UNH.

Initiative 1.1. The ADVANCE Office will work with the Provost, the Vice Provost for Faculty Development and Inclusive Excellence and the Affirmative Action Officer to:

- Develop and implement a training program for search committee members that focuses on unconscious bias, broadening searches to achieve a pool that reflects the gender demographics of the field, and a culture of family accommodation for the on-campus portion of the search process.

- Implement a policy that will require all search committee members to complete this training before they are allowed to serve.

- Appoint an ADVANCE Faculty Fellow to oversee the search committee training program and seven ADVANCE advocates (one from each of UNH's schools and colleges as well as EOS). These ADVANCE advocates will participate in search committee training and ask questions when the applicant pool doesn't reflect the number of practicing women/minorities in a given field or when female candidates are rejected from consideration. ADVANCE advocates will be drawn from existing senior faculty with experience in facilitating gender balances in departments (e.g. Prof. Will Clyde, current chair of the Earth Sciences department, the only STEM department at parity at UNH (see letter of commitment). ADVANCE advocates will be nominated by the deans and directors in consultation with the ADVANCE Program Director and appointed by the Provost. The Faculty Fellow and Advocates will receive support through the grant.

Initiative 1.2. Because UNH has very few women at the senior level (See Table 1), the University will work to increase the number of female faculty at the senior level through both promotion of existing mid-level faculty and, where possible, targeting new hires at the senior level.

Recently, the UNH Provost, PI John Aber, mandated that all departments outline clear expectations for faculty promotion and tenure. An ADVANCE Faculty Fellow will be appointed to address this issue in collaboration with the ADVANCE Steering Committee whose members include key faculty and representation from the AAUP and the Faculty Senate. The committee will review the guidelines developed by the departments and make recommendations based on best practices to ensure that they are unambiguous and focused on the success of our faculty. We propose to implement a five-year review process in which departments will be required to participate. Part of this review process will involve an assessment of data from departments on the rate of promotion of faculty so that gender discrepancies can be identified and corrective measures taken. The ADVANCE Faculty Fellow will also be responsible for continuing the *ADVANCing Your Career at UNH and Beyond* professional development program for mid-level faculty women begun as part of the UNH PAID effort.

According to information collected during the *ADVANCing Your Career at UNH and Beyond* program, research faculty are experiencing significantly different practices across campus regarding hiring and promotion. The Senior Vice Provost for Research Jan Nesbit has recently begun the first ever review of policies regarding research faculty at UNH. The ADVANCE Faculty Fellow will work with the Research Office, the deans and directors and the newly formed Research Faculty Council to align these policies across the campus and align them with best practices for recruitment, retention and promotion of research faculty. In the past, UNH has benefitted from long-term retention of research faculty who are funded through grants and contracts for many decades. The ADVANCE Director will support this effort to ensure that these valuable members of the UNH community receive equitable treatment. This measure will also serve to decrease the rate of female faculty attrition at UNH.

A visiting faculty program will be implemented as a way to build exposure and networking with research active senior female faculty from other institutions. This program will allow UNH departments to apply to the ADVANCE program for support to bring senior female faculty from other universities to build research collaborations in their department and/or with other departments. The ADVANCE program will support (up to $26K) the travel expenses and research supplies for this individual and assist her in arranging the research and networking that will occur.

Goal 2. Improve support and culture at the departmental-level climate for STEM faculty women through increased department chair professional development and assessments, and formal mentoring policies and practices.

To support requisite climate and policy changes at the departmental level, we propose the following initiatives:

Initiative 2.1. In collaboration with the FMPDP led by Co-I Mitchell, we will create and deliver a world-class professional development program for department chairs to increase awareness of gender issues. An ADVANCE Faculty Fellow will be appointed to work with the Provost, the Vice Provost for Faculty Development and Inclusive Excellence, other members of the ADVANCE Leadership Team, and the ADVANCE Steering Committee to develop a policy for mandatory department chair and center director training program. This training will include coordinated professional development opportunities:

- The objective of the program will be to (1) increase department chairs' awareness of implicit assumptions and unconscious biases and their effect on decision making and behavior, (2) guide them in an exploration of their own implicit assumptions to see how these may be impacting the departmental climate issues and hiring and promotion decisions, and (3) help them to develop the skills and tools needed to overcome their implicit biases or assumptions. The impact of this particular intervention will be the subject of the social science investigation described in section 6.c. and the supplementary documents.

- Chairs in gender imbalanced fields will be strongly encouraged to attend workshops offered by relevant professional organizations (e.g., American Geological Union (AGU) workshops, or American Physics Society (APS), or University of Washington's LEAD program developed under an ADVANCE IT grant). The UNH ADVANCE program will provide travel support for chairs to attend these activities and in return they will be expected to share their experiences with other department chairs by conducting a seminar or talk within their college. Each college and EOS will devote two Leadership Team meetings per year to ADVANCE training and these may include talks by chairs returning from workshops on diversity.

- We will offer UNH specific leadership development training to associate professors (nominated by their Dean/Director) to prepare them to become chairs, directors, and/or associate deans. In

this way we will be preparing the future leaders of the University. At ADVANCE PAID events, we became aware of the lack of faculty training for leadership positions available at UNH.

Initiative 2.2. The ADVANCE program will work with the Office of the Vice Provost for Faculty Development and Inclusive Excellence and the deans and director to establish a formalized mentoring policy. An ADVANCE Faculty Fellow will provide oversight for this initiative.

Some departments on campus already have successful mentoring models, and there are many successful models from other institutions. We will identify those departments and models, engage those chairs to help us develop this program and implement it in all departments. It will likely consist of partnering new hires with more senior faculty members in their department and identifying a second mentor from outside their department. The policy will require mentors to be trained periodically to ensure they maintain the required skills. The mentor and mentee will also go through common experiences to build their mutual trust and sense of community. A second policy will be the requirement that all new faculty participate in the Faculty Mentoring and Professional Development Program.

Goal 3. Conduct a wage equity analysis and recommend any policy changes that might be indicated.

Prior studies on wages among faculty suggest that there remains an unexplained salary gap between women and men in academia, and that women lag in salary compared to their male colleagues (e.g., Bellas, 1993; Monks and McGoldrick, 2004; Ward, 2001; Umbach, 2007; Warman et al., 2010). Some ADVANCE IT institutions also found unexplained salary differences among male and female faculty. For example, researchers at California State Polytechnic University in Pomona found a statistically significant gender wage gap in their 2005 study but none in their 2008 study. The 2005-2006 study by the University of Michigan also found a statistically significant gender wage gap.

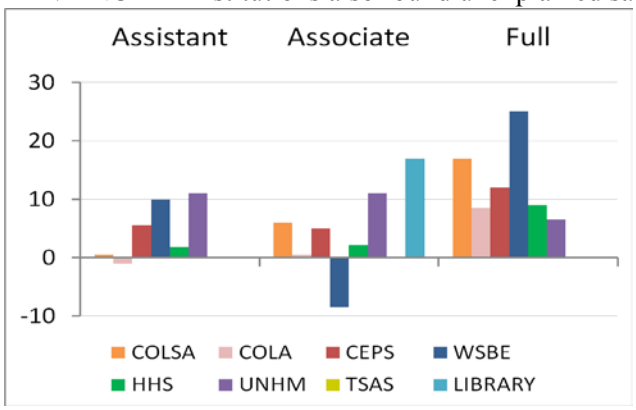


Figure 2. Average absolute salary gender differences among faculty by rank and college (thousands of dollars).

At UNH a preliminary analysis of 2008 institutional data indicates that, with few exceptions, men on average earn higher wages than women at every rank in every college (Figure 2). Exceptions are assistant professors in COLA and associate professors in WSBE and the Thompson School.

We propose to use a traditional wage equation approach based on the hedonic methodology (Rosen, 1974) which allows recovering the marginal effects of explanatory variables, or an individual's characteristics on wage differences. Marginal differences for any specific characteristic represent and approximate the change in salary if this characteristic increases by one unit. Based on the literature on this topic, we expect that rank, age, years at current rank and years since tenure are positively related to the size of salary (e.g., Barbezat and Hughes, 2005; Toutkoushian et al., 2007; Umbach, 2007). The year when an individual obtained his/her terminal degree is expected to be negatively associated with salary size: the higher the year, the more recent it is. Some differences in salary may also arise from length of service at the institution, college/department affiliation, other factors, including an individual's bargaining skills and gender. The proposed analysis will investigate whether differences in wages among male and female faculty at the UNH can be explained in part by gender differences in bargaining skills. This insight, to the best of our knowledge, will make a contribution to the growing literature on wage equation in general and studies on academic wage differences in particular. This information will also help us establish a policy

that an analysis of wage equity at the University be conducted on a regular basis (every five years) to ensure that those making decisions on hiring and promotion are aware of the inequities that may exist.

Goal 4. Develop more flexible workplace policies that support career advancement for STEM faculty women.

UNH was recently recognized as a 2011 recipient of the Alfred P. Sloan Awards for Business Excellence in Workplace Flexibility. This prestigious award recognizes employers for the value they place on workplace flexibility as an important component of its organizational success and as a key to being an employer of choice for its current and future talent. After extensive research by the President's Commission on the Status of Women, UNH established the Workplace Flexibility Taskforce in June 2011 to develop polices and guidelines to further support flexible work arrangements for university staff.

At UNH, nontraditional work schedules align with many of the university's interests, including:

- A strategic plan that envisions new approaches to time allocation in pursuing our mission of teaching, discovery and service,
- The need to recognize and adjust to the reality that employees increasingly face the challenge of balancing personal and professional demands, and that those demands may change during a career,
- The need to remain competitive in recruiting and retaining talented employees by paying attention to contemporary practices of employers of choice,
- Supporting the university interest in utilizing its physical assets more fully to increase revenue producing activity year round,
- Mitigating the tendency of traditional calendars and schedules that lead to the need to maintain peak transportation, parking and energy capacity,
- Taking advantage of new information technologies to make possible opportunities for many employees to effectively perform some work at home or in remote sites, and
- Supporting a strong performance-based culture focused on results whereby flexible work arrangements and a results orientation need not be at odds, but can be a win /win for the university and its staff.

The flexible work options include flex time, part time, job sharing, compressed work week, telework and remote work. During Fall 2011, the taskforce is conducting a needs assessment/survey, examining current policies and practices, and identifying needs for policy development and guidelines. This taskforce is currently focused on policies for staff and plans to have a full set of recommendations and an implementation plan by winter 2012. The ADVANCE program will take the recommendations from this review (due February 2012) and apply them to faculty positions. We expect to focus initially on policies related to family leave and its impact on tenure, child and elder care access, and education and awareness of existing policies for both the faculty themselves and the chairs and directors.

Goal 5. Create and maintain campus-wide awareness of the issues addressed and policy changes made under this IT initiative.

The ADVANCE Office will work with the UNH Office of Communication and Marketing to develop a communication strategy and timeline. The Office will develop and maintain a website for the UNH UNBIASED program that will be updated regularly to highlight initiatives and program activities. Monthly news items will be featured on the UNH homepage including results from the institutional data analysis and policy changes. Articles will be developed for the UNH Campus Journal and the UNH Alumni magazine to provide regular coverage of ADVANCE IT activities. A Facebook presence and an UNBAISED list serve will be developed and maintained to distribute opportunities and information to faculty across campus. The ADVANCE Office will host a brown bag lunch series twice each semester to engage faculty in discussions on campus climate policy and gender issues in the STEM disciplines. In addition to campus wide communication, we plan to submit scholarly articles based on the social science study as well as those on engagement at the University.

6.c. Social Science Study

A key initiative of the proposed UNH ADVANCE IT program is the department chairs' professional development program. We propose to undertake a social science study to investigate the impact of this program on the representation of and department-level climate for women faculty at UNH (see supplemental documents for more detail). A quasi-experimental design will be used to test several hypotheses. Results will inform the current literature in this area as well as future NSF ADVANCE programs with similar goals. The experimental methodology should allow us to draw conclusions with respect to the effect of the professional development initiative on faculty representation and perceived climate. The results will be important either way. If no impact is found, then even more careful scrutiny and funding for training initiatives will be warranted. If there is an impact, training initiatives should be further encouraged.

7. Dissemination and Broader Impacts

There are several important audiences for the dissemination activities of this ADVANCE program: the UNH community (through involvement and engagement), NH statewide higher education learning communities (e,g, through presentation during the biennial Inclusive Excellence Summit), other ADVANCE institutions (e.g. through the annual ADVANCE Awardees Meeting and the ADVANCE Portal at Virginia Tech (http://www.portal.advance.vt.edu/), and the broader academic community (through the peer-reviewed literature).

This project has the potential of transforming an institution that has existed as a flagship institution of the State of New Hampshire for almost 100 years. In addressing the bias and implicit assumption problem head-on, we specifically hope to increase forever the representation of women in fields where they have traditionally been scarce, and improve the climate and support for women faculty at UNH. We also hope to integrate unbiased processes and procedures into the very fabric of the institution, which is bound to have spillover effects to all areas where bias has existed in the past, including ethnicity, disability, and sexual identity, as well as to the broader society by increasing the balance for role models in the STEM fields.

The results of the quasi-experiment that will be carried out to analyze the impact of the department chairs professional development will advance knowledge in this area and guide future projects proposing to use similar interventions to effect change, whether or not a significant effect is found. If a significant impact is found, this should encourage the further use of training to change behavior and climate in university departments and at other institutions. If no significant impact is found, then this would call for even more careful scrutiny of the nature of proposed training initiatives and possibly whether to fund such initiatives at all. The results of the study are expected to be presented at conferences and published in a peer reviewed publication.

8. Project Management

The UNH ADVANCE IT program will be a collaborative effort among faculty and administrators from across UNH in several key colleges, departments and institutes. These individuals share a common vision, the continued advancement of women and underrepresented faculty at UNH. As PI, UNH Provost John Aber will have primary responsibility for assuring that all the project's goals are accomplished. Working closely with the project's Leadership Team and UNH President Mark Huddleston and Provost Aber will champion actively for UNH ADVANCE initiatives, make recommendations for changes in policies and practices, and seek sustained funding for the programmatic activities. The Provost will also chair the External Advisory Board (see description below).

A Leadership Team consisting of the PI, the Co-Is, and the ADVANCE Faculty Director will meet on a bi-weekly basis to plan, organize resources, make budget recommendations, and monitor the key activities and initiatives. Co-Is for the UNH ADVANCE IT program are: Dr. Wanda Mitchell, Vice Provost for Faculty Development and Inclusive Excellence, who is responsible for UNH Faculty Mentoring and Professional Development Programs and inclusive excellence initiatives, will have oversight of the Faculty Director of the UNH ADVANCE office; Dr. Karen Graham, Mathematics Professor and Director of the Leitzel Center for Mathematics, Science, and Engineering Education who will continue her role as lead Co-I and will serve as the ADVANCE Faculty Director; Dr. Samuel Mukasa, Dean of the College of Engineering and Physical Sciences, UNH's largest STEM college, who will co-chair with Dr. Mitchell the program's Leadership Team; and Dr. Christine Shea, Associate Dean for Graduate Programs and Research and Professor of Technology and Operations Management in the Whittemore School of Business and Economics who will serve as UNH lead for the project's social science component and the liaison with the project's external evaluator.

A UNH ADVANCE Office will be established within the Office of the Vice Provost for Faculty Development and Inclusive Excellence. The UNH ADVANCE Faculty Director (Graham) will be responsible for the primary oversight of all ADVANCE project initiatives. The ADVANCE Program Coordinator (to be hired) will be responsible for the day-to-day oversight, coordination, and implementation of all ADVANCE project activities. An assistant will also be hired to provide logistical and administrative support for the UNH ADVANCE Office and all project initiatives. ADVANCE Faculty Fellows (5) will be appointed to direct several of the key ADVANCE initiatives such as the search committee training, promotion and tenure policies, the mentoring program, and oversight of internal evaluation. ADVANCE Advocates (7) will work with each school and college on search committees and mentoring initiatives.

An ADVANCE Steering Committee consisting of key University leaders will be established and provide advice and direction to the project from the broader institutional perspective - analyzing what's working and what's not, and identifying program opportunities and challenges. All members of the committee will serve as ADVANCE program advocates within their respective departments and colleges. The Steering Committee will meet with the ADVANCE Leadership Team on a monthly basis. Members will include: Jon Wraith, Interim Dean of College of Life, Science and Agriculture, Ken Fuld, Dean of College of Liberal Arts, Dan Innis, Dean of Whittemore School of Business and Economics, Harlan Spence, Director of the UNH Institute for the Study of Earth, Oceans, and Space, Dr. Larry Prelli, Chair of the UNH Faculty Senate, Deanna Wood, President of the UNH AAUP, Dr. Ruth Varner, Co-Chair of the UNH Women's Commission. The committee will also include the Chair of the Research Faculty Council, two additional STEM department chairs and faculty from UNH-Durham, and two additional faculty from UNH-Manchester and UNH Cooperative Extension who will serve rotating two-year terms.

An External Advisory Board, chaired by the PI will be established. The following individuals serve on the advisory board for the current UNH ADVANCE PAID and have agreed to serve on the advisory board for the ADVANCE IT: Dr. Susan Carlson (Vice Provost for Academic Personnel, University of California), Dr. Mary Juhas (Senior Assistant Dean, Materials Science and Engineering, The Ohio State University), Dr. Joan Leitzel (UNH President Emerita and former chair of the Mathematical Sciences Education Board), and Dr. Judith White (President and Executive Director, Higher Education Resource Services (HERS)). Dr. Janet Campbell (Research Professor Emeritus, UNH Institute for the Study of Earth, Oceans, and Space) has also agreed to serve. The board will meet once a year on the UNH campus and other virtual meetings will be conducted as needed.

9. Project Evaluation

Project evaluation will be carried out by an internal and external evaluator and will include both quantitative and qualitative methods. A logic model will be created to guide evaluation activities and to establish baseline measures as well as indicators to measure progress toward program goals. Formative evaluation will commence immediately and continue throughout the grant, providing feedback to refine activities and better measure the impact of program activities on goals, improve communication among stakeholders, and address challenges as they arise. A final summative evaluation will occur in year 5 to evaluate how well the project has met its goals, including the institutionalization of successful activities and dissemination of results.

The evaluation will be guided by the following questions:

- Is the project being implemented effectively and according to schedule? (i.e., Are the proposed activities being undertaken? Are major benchmarks being met?)

- Are data being collected to provide baseline measures of desired outcomes and track progress toward project goals? (i.e., Are appropriate metrics being developed? Are the data being collected sufficient for measuring project outcomes?)

- How well has the project reached its goals? Are successful activities and policies being institutionalized? (i.e., Have goals been reached? What is the evidence for institutional change? What is the evidence that any changes are the result of the project activities?)

- How effectively have results been disseminated to a broader national audience? (i.e., Are results being submitted to and accepted for publication in scholarly and professional journals? Are results being disseminated to other institutions?)

9.1 Internal Evaluation

The University of New Hampshire's Office of Institutional Research and Assessment (IRA), which reports to the Senior Vice Provost for Academic Affairs, will work closely with the ADVANCE Faculty Director and an ADVANCE Faculty Fellow with evaluation expertise to implement the internal evaluation plan. The IRA and the ADVANCE PAID program have a record of collaboration and data sharing that will allow our new program to be successful. We have already implemented the collection of an institution- wide data set based, in part, on the ADVANCE Indicators toolkit, that we are analyzing currently in collaboration with IRA. IRA will update that dataset annually which includes the NSF indicators outlined by the ADVANCE program. As mentioned in the wage equity study (Goal 3) we will work with IRA to complete this study. Representatives from IRA will also serve on the sub group working on the social science data collection study including development of the surveys for this group.

9.2 External Evaluation of UNH UNBIASED

Dr. Mariko Chang will serve as the external evaluator. Dr. Chang is a sociologist with experience evaluating ADVANCE Programs and working with universities to diversify their faculty. She has also served on several ADVANCE review panels and site visit teams. Please see her letter of commitment and biosketch in the supplementary documents. She will provide annual evaluation reports and semi-annual updates to inform program activities and progress.

An overview of sample goal-specific evaluation questions, benchmarks, indicators, and evaluation methods for each program goal and activity is provided in Table 2.

10. Results from prior funding.

Results from our ADVANCE PAID funded in 2009 are summarized in section 4.

Table 2. Program goals, activities, evaluation questions, benchmarks, indicators, and evaluation methods.

Program Activities	Sample Evaluation Questions	Sample Benchmarks and Possible Indicators	Data, Evaluation Methods
Goal 1: Increase the number of STEM women faculty at all ranks through changes in recruitment and retention policies and practices.			
1.1 ADVANCE Director works with search committees (composition, training, liaison) 1.2 Increase STEM faculty at senior levels	• Are search committees trained to reduce unconscious biases, diversify applicant pools and recruit diverse faculty? • Is search committee training increasing the recruitment of women faculty? ☐How do current promotion policies impact the retention and promotion of STEM women faculty? How might policies be improved?	☐Search committee training program developed ☐University creates policy requiring all search committee members to complete training ☐% of women STEM faculty in applicant pools, on short-list, interviewed, made job offers, and hired ☐# of STEM women faculty increases at all levels	Institutional data on new hires, promotion, and distribution of faculty by department, rank, and sex Search committee data Interviews or focus groups with faculty, search committees, chairs
Goal 2: Improve support and culture at the department level for STEM women faculty.			
2.1 Chair professional development 2.2 Faculty mentoring	☐Are workshops effective for enhancing chair knowledge of implicit bias and other issues affecting STEM women faculty? ☐In what ways does a formal mentoring program improve levels of support for STEM women faculty?	☐Policy requires chair & center director training ☐# of chairs trained ☐# of depts. with formal mentoring programs ☐STEM women faculty report receiving mentoring that meets their professional needs	Interviews or focus groups with faculty, chairs, directors Workshop surveys Review of mentoring policies
Goal 3: Conduct salary equity analysis and create recommendations to equalize salaries			
Salary equity analysis	☐What factors account for any salary differences? ☐What recommendations would reduce disparities?	☐Policy in place requiring regular analysis of wage equity at UNH	Quantitative analysis of salary data
Goal 4: Create more flexible workplace policies to support career advancement			
Flexible workplace policies are created	☐Are new policies being enacted? ☐Are faculty, administrators aware of new policies? ☐How well do policies support STEM women's career development?	☐New work-life policies are in place ☐Faculty report institutional support for new policies and report the policies enhance their career advancement	Review of past and current policies Interviews and/or focus groups with faculty
Goal 5: Create and maintain campus-wide awareness of project goals and policy changes			
Website Alumni Magazine Facebook presence	☐Have the project's goals and policies been disseminated to the UNH community?	☐The UNH community reports awareness of project's goals, activities and new policies	Review of media Interviews or focus groups with faculty, administrators