
AC 2012-5200: WOMEN OF WESTERN: THE VOICES OF WOMEN - ADVANCE CATALYST AT A COMPREHENSIVE INSTITUTION

Prof. Kathleen L. Kitto, Western Washington University

Kathleen L. Kitto is currently the Special Assistant to the Provost for Strategic Initiatives and Acting Dean of the Graduate School and Vice Provost for Research at Western Washington University. Kitto has served WWU for more than 20 years and has played a number of roles within the university including eight years as the Associate Dean of the College of Sciences and Technology, seven years as the Chair of the Engineering Technology Department, and one year as the Director of the Advanced Materials Science and Engineering Center (AMSEC). She was actively involved in the creation of AMSEC and the new minor in materials science at Western. She is also played a role in the efforts to establish a technology and innovation center (TDC) in Bellingham. She was awarded an NSF ADVANCE Catalyst grant (along with co-PIs Norman and Guenter-Schlesinger) to promote the advancement, retention, and recruitment of women in STEM disciplines at Western. In 2010, she received Western Washington University's Diversity Achievement Award, the highest honor for diversity achievements at WWU. Also in 2010, PIs Kitto and Jusak were awarded a CCLI grant to develop applications and modules for materials engineering and science education. She has published more than 50 papers and given presentations at numerous conferences, co-authored three text books, and written an invited book chapter and several lab manuals. She is a member of the Society of Manufacturing Engineers, American Society of Mechanical Engineers, the American Society of Engineering Educators, the Materials Research Society, and ASM International. Her primary research interests are in curriculum design for materials education, STEM learning, and acoustic properties of materials.

Dr. Sue Guenter-Schlesinger, Western Washington University

Sue Guenter-Schlesinger is Vice Provost for Equal Opportunity and Employment Diversity at Western Washington University. Previously, she served 14 years as Assistant Executive Vice President, Equal Opportunity and Affirmative Action at Utah State University. She also held an adjunct position at USU in the Department of Sociology, Social Work, and Anthropology. After earning her B.A. and M.A. in English and her Ph.D. in higher education from the University of California, Los Angeles, Guenter-Schlesinger began her career with the University of Maryland's European Division and the U.S. Army Research Institute. She then served as Director for the U.S. Army's Equal Opportunity Program in the European Command, located in Heidelberg, Germany. In her current role, Guenter-Schlesinger is Chief Advisor to Western's President and Provost on equal opportunity and employment diversity issues. Her current responsibilities include strategically working on implementing initiatives aimed at recruiting and retaining a diverse workforce. She also implements both equal opportunity and affirmative action legal mandates, as well as investigates race, gender, and other legally protected category complaints and provides workshops and training in the prevention of sexual harassment and in valuing diversity. Guenter-Schlesinger has served as co-PI on the NSF Catalyst ADVANCE Grant for Women in Sciences and Engineering. Having worked on equal opportunity and diversity issues for more than 25 years, she has received a myriad of honors and awards, including serving at the request of the Secretary of Defense on the Defense Advisory Committee for Women in the Services (DACOWITS). She has consulted, spoken and written extensively on diversity subjects both nationally and internationally, and is considered an expert in her field.

Women of Western – The Voices of Women – ADVANCE Catalyst at a Comprehensive Institution

Abstract

Overall, the ADVANCE Catalyst program at Western Washington University provides the resources and time necessary for us to probe deeply into our internal practices, measure outcomes for faculty, and, most importantly, find and focus on the barriers that impede the advancement of women faculty within the College of Sciences and Technology (CST). One component of the project was the development of a climate survey, which was based upon previous surveys at ADVANCE (research-intensive) universities, but was specifically adapted to address faculty issues unique to comprehensive universities. The development of our survey involved our Faculty Leadership Team (FLT), our department chairs/directors, and several other faculty members. This paper focuses on the findings from the comprehensive institution climate survey that we developed, which consisted of approximately 100 questions in seven areas of climate indicators: employment demographics, job satisfaction, mentoring, leadership, department climate, professional development, and equal opportunity. Specifically, we were probing whether department dynamics stay “status quo” longer, if perceptions of peers play a heavier role in evaluation, if there are more feelings of isolation, and if opportunities for collaborative work are greatly decreased in our relatively small sized departments (as compared to research-intensive institutions). All faculty members within CST were surveyed. The overall response rate was 58%. Tenured women had the highest response rate, at 87%, and 73% of non-tenure track (NTT) women responded. After analyzing the data from the survey and meeting with our ADVANCE FLT, we identified several key areas of climate indicators that were explored further in focus groups: balance of work-life and work-load, leadership and career development, and equal opportunity.

Through our survey, town hall meeting, and focus groups, we found that the evolution of our comprehensive institution from a primarily teaching university to an institution where a research program is expected has placed considerable pressure on our faculty, especially those at mid-career. Our heavy teaching responsibilities (inflexible lab schedules, research with undergraduates, course innovation, mentoring/advising), and service commitments constrain time to such an extent that many faculty feel that their research programs suffer or become second jobs. CST women serve on more committees, perform much of the more time consuming service, and have had fewer leadership roles and opportunities. Lack of formal mentoring exacerbates these issues for our women. While Western has many policies and programs to address such obstacles, faculty are often not aware of them or misunderstand them, making them, in fact, inaccessible. Until recently, department chairs did not have enough leadership training, development, and support. Continuing budget cuts and soaring STEM student demand at our institution further intensify these key issues. Based upon the survey, focus groups, and conversations with our FLT, we believe that a Faculty Advancement Center (FACT) focused on career span initiatives and based upon ADVANCE best practices would be the next logical step necessary to support women at our institution.

While this paper focuses on the results of the climate survey, the paper concludes with the next logical steps for our campus and includes a contextual summary of the other findings. While all the components of the project leading to these conclusions are not discussed in this paper, it does describe the context of the work that has been completed thus far. The research in this project is supported by the National Science Foundation's ADVANCE Catalyst program (NSF #0811257).

Campus Overview

Western Washington University, located in Bellingham, Washington is a high-quality comprehensive university serving almost 15,000 students through our 160 plus programs of study. Although approximately 94 % of our students are undergraduates, Western is also home to several outstanding masters-level graduate programs within the CST. The student-to-faculty ratio is 21:1, and the retention rate for the second year is relatively high at 84%. This academic year Western admitted 2700 freshman and 1300 new transfer students. The academic units of the University consist of seven colleges and the Graduate School. The Principal Investigators (PIs) on our ADVANCE Catalyst program were: the Dean and the Associate Dean of the CST and the Vice Provost for Equal Opportunity and Employment Diversity.

Western's Equal Opportunity (EO) Office assists faculty, staff and students by implementing both anti-discrimination laws and university policies that prohibit discrimination and by helping create an environment in which diversity is valued. It also works to increase access for the employment for women, people of color, people with disabilities, and veterans who have traditionally faced barriers to employment opportunities. Western compiles and updates annual Affirmative Action Plans that help guide leadership on understanding which disciplines are underrepresented, by women and minorities, proportional to availability in the labor market. Goals are set, and the EO Office then works with departmental searches to recruit diverse applicants to apply for open positions. Currently, the EO Office is working closely with the CST to assist search committees in undertaking proactive outreach to attract women and minorities (both underrepresented groups in STEM disciplines on our campus) for open positions.

CST was formed in 2003, and as such is a relatively new college of the University. The College was formed through reorganization of a large College of Arts and Sciences, a process that resulted also in formation of the new College of Humanities and Social Sciences. CST is Western's second largest academic unit consisting of seven departments: Biology, Chemistry, Computer Science, Engineering Technology, Geology, Mathematics, and Physics/Astronomy. The College is also home to the Science, Mathematics and Technology (SMATE) program and the Advanced Materials Science and Engineering (AMSEC) and Internet Studies Centers and partners with the College of Humanities and Social Sciences to offer an interdisciplinary neuroscience degree program. CST departments offer 33 bachelors degrees and 8 master's degrees, along with interdisciplinary degrees within CST such as mathematics/physics, mathematics/biology, and biology/chemistry. The College also collaborates with Huxley College of the Environment, the College of Business and Economics (CBE), and the College of Humanities and Social Sciences to offer several other combined majors.

Climate Survey

During Spring quarter 2009, we administered a Climate Survey in which all of the faculty (tenured, tenure-track and non-tenure track) within CST had the opportunity to respond. Based upon feedback from NSF panel members and program officers, we agreed that it would be more efficient to model the climate studies after existing ADVANCE surveys. The PIs, our Research Associate (RA) and a small team of faculty members (lead by the Chair of the Sociology Department, Dr. Karen Bradley) gathered an aggregate of questions from five other ADVANCE Climate Surveys¹: the Survey of Academic Climate and Activities from the University of Michigan², The Faculty Work Climate from the University of Illinois at Chicago³, the University Community and Climate Survey at Case Western Reserve University⁴, the Department Climate Survey at the University of Wisconsin at Madison⁵, and the Kansas State University Community and Climate Survey⁶.

Although these survey models from research-intensive institutions were useful in designing our survey, we adapted survey questions to capture information specific to comprehensive universities and to Western Washington University specifically. After reviewing and shaping relevant questions, we sought input from several female CST faculty members and other faculty leaders as well as the CST department chairs and directors. The development of the survey was a lengthy process and time-consuming, but served as an important starting point for many other components of our project. The resulting survey consisted of 100+ questions in seven areas of climate indicators: employment (14), demographics (8), job satisfaction (25), mentoring (8), leadership (7), department climate (14), professional development (13), and equal opportunity (13). The intention was only to capture a snapshot of faculty perceptions. We further explored underlying factors affecting these perceptions in smaller Focus Groups, which were administered by our research associate (RA) in order to assure confidentiality (the possible sample size is very small).

The survey was intended to only identify large-scale climate issues within CST. Because of the length of the survey, we decided that it would be best to capture the big picture of climate issues in the survey and then have discussions/presentations and focus groups later. Thus, we could present our findings first and then later try to delve into the details in town hall presentations and the much smaller focus group settings.

The women faculty who worked on the development of the survey with us did not want the survey data collected by department. They felt that it would be too easy to identify individual responses within the survey. Some departments have a small number of women (two, for example), and we have only one female department chair, so their concerns were real. Thus, we decided to separate out the departments with a larger number of women (more than five) from the departments with five or fewer than five women in the data by asking a question about the current number of tenured and tenure-track women faculty in the department. But, only the aggregated data would be presented publically. We hoped that by using this strategy the women faculty in the departments with a small number of women would be free to honestly answer the survey questions and participate in the subsequent focus groups.

As we stated in our original proposal to NSF, we feel that basic faculty roles are somewhat different at comprehensive universities than at research-intensive universities since a heavier emphasis is placed upon teaching primarily undergraduates, including significant student-centered individualized independent study and research experiences. Teaching schedules at comprehensive universities, especially in STEM disciplines where laboratory facilities are heavily scheduled, are often inflexible and frequently require daily commitments, perhaps making it more difficult to balance work-life issues, schedule research activities or participate in faculty development opportunities⁷⁻¹⁶.

The survey we designed was intended to probe the concept that one's professional success depends upon the presence of a supportive department climate and that department environment greatly affects retention²²⁻³². We speculated in our proposal that productivity in comprehensives may be more heavily influenced by department climate than at research-intensive institutions, resulting from qualities unique to comprehensives as noted above. For the project as whole, we are attempting to answer whether the following assumptions are true about Western Washington University:

- Given that many departments are small (10-15 faculty members) and some departments have infrequent opportunity for more hires, departmental dynamics may tend to stay "status quo" longer in departments where the mix of faculty changes slowly.
- Perceptions by peers might play a relatively more significant role in evaluation, compared to faculty in research universities whose productivity measures are more heavily weighted to nationally recognized research endeavors.
- There might be a greater probability for isolation and feelings of isolation for those faculty groups in the numerical minority (women and minorities), as compared to research universities, in light of the first two assumptions noted above.
- Opportunities for joint research projects or working with larger teams of faculty (or students) might be greatly diminished, simply based on the smaller size of comprehensives compared to many research institutions.

We also tried, within the survey, to understand how well the faculty members' expectations of a comprehensive institution matched their experiences and how their level of satisfaction plays a role in their overall success and satisfaction with their own career. We might also note that Western is a particularly research active comprehensive institution, which differs greatly from the Western of 20 years ago. We identified three key areas of climate indicators for further exploration in our focus groups: balance of work-life and work-load, leadership and career development, and equal opportunity.

Though our survey, town hall meeting, and focus groups, we found that the evolution of our comprehensive institution from a primarily teaching university to an institution where a research program is expected is placing considerable pressure on our faculty, especially those at mid-career. Heavy teaching loads (inflexible lab schedules, research with undergraduates, course innovation, mentoring/advising) couple with service commitments, to constrain time to such an extent that many faculty feel their research programs suffer or become second jobs. Faculty constantly feel considerable pressure in work-life balance issues, especially as teaching and

service crowd out time necessary for scholarly activities. CST women faculty serve on more committees, perform much of the more time consuming service, and have had fewer leadership roles and opportunities. This is especially unfortunate given the ever-rising research expectations on campus. Lack of formal mentoring has especially exacerbated these issues for women at mid-career and beyond, many of which received no mentoring at all during their careers. Expectations for our faculty have changed significantly during many of their careers.

While Western has many policies and programs in place to address such obstacles, faculty are often not aware of them or misunderstand them, rendering them, in practice, inaccessible. Department chairs did not have enough leadership training, development and support to most effectively assist faculty (subsequently, this issue has been addressed by campus leadership). Continuing and significant budget cuts and soaring STEM student demand at our institution continues to amplify these key issues.

Survey Results

All faculty members in the seven CST departments: Biology, Chemistry, Computer Science, Engineering Technology, Geology, Mathematics, and Physics were surveyed. In total, 139 tenured (T), tenure track (TT), and non-tenure track (NTT) faculty were invited to respond, which included 44 women and 95 men. The overall response rate was 58%. One woman and one man who responded did not disclose their employment category, and there was one TT faculty member who did not disclose gender. These three faculty members are not included in any analysis by employment category or gender. Figure 1 shows the absolute participation numbers of faculty, while Figure 2 shows the participation rate by percentages. Of particular note is the high participation rate for both the tenured women and the NTT women. Tenured women had the highest response rate, at 87%, while NTT male faculty had the lowest response rate at 31%. On the other hand, 73% of NTT women responded. We especially note the significant engagement of our NTT women and believe it is imperative for ADVANCE programs to develop programs and initiatives to support them. Many of our NTT women have served our institution in the long-term, yet very few policies and programs support their needs.

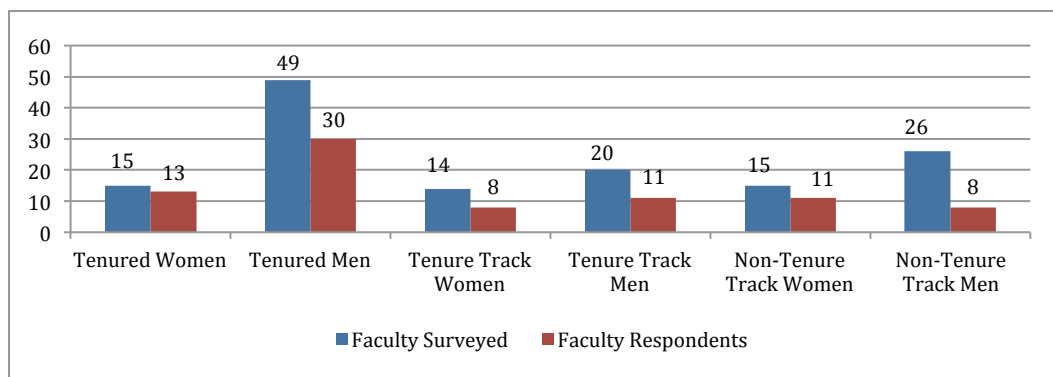


Figure 1. Faculty Surveyed

It also should be noted that a quick review of the absolute numbers of faculty within a particular rank when spread over the seven academic departments illustrates just why so many women were concerned about anonymity in our work.

For tenured faculty, women were more likely to indicate that a balance of teaching and research was a strong motive for accepting a position at a comprehensive institution (92% for female tenured faculty compared to 60% for male tenured faculty – see Figure 3). But, about 40% of both male and female tenured faculty chose work-life balance as a motivator for accepting a position at a comprehensive. Eighty percent of female tenured faculty chose salary as a strong motivator for accepting a position at Western as compared to 10% of male tenured faculty. The collaborative environment at a comprehensive was also a key factor for tenured women faculty members. It is interesting to note that this finding confirms one of our speculative points. While women expect to find collaborative opportunities at comprehensive institutions such as ours, the small size of our departments as compared to research-intensive institutions actually diminishes these opportunities. About one third of the faculty brought up concerns about the differences in their initial expectations and actual work-life experiences.

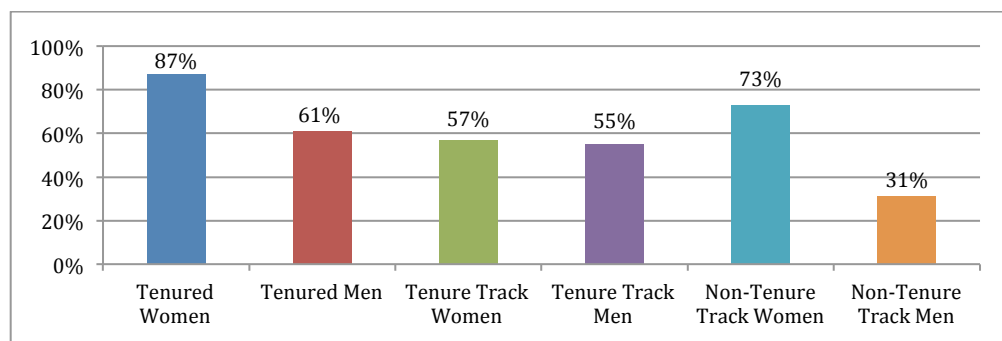


Figure 2. Participation Rates of Faculty Who Responded

Seventy five percent of female TT faculty chose teaching, collaborative work environment, and a balance of teaching/research as strong motivations for accepting a position at Western, while about 80% of male tenure track faculty chose work-life balance and teaching/research balance as strong motivations. It was interesting that the most important considerations for TT faculty were different than those for tenured faculty, and those expectations differed more by gender for tenured faculty. We speculate that these differences may also reflect the changing nature of comprehensive institutions. Across all ranks, the opportunities for collaboration seemed more important to women considering careers at comprehensive institutions.

We also surveyed faculty regarding the distribution of time faculty allocated to teaching, research, and service. While TT males report nearly 67% of their time was allocated to teaching activities, all the other faculty groups reported spending about 60% of their time on teaching. One remarkable difference revealed is the balance of service and research activities for the tenured female faculty, who spend the most amount of time of all faculty groups on service (24%) and the least amount of time on research (16%). When faculty were asked to rate their satisfaction level with the distribution of activities, tenured female faculty were the least satisfied at 46%, versus the 63% - 72% (note spacing between range) satisfaction rate found in the other

groups. The survey revealed that almost half of our tenured women served on 5-10 committees (in the survey year), while only 3% of the male faculty serve on 5-10 committees (Figure 5). These findings are certainly important, especially given that women faculty also reported having fewer leadership opportunities (discussed later) on these committees.

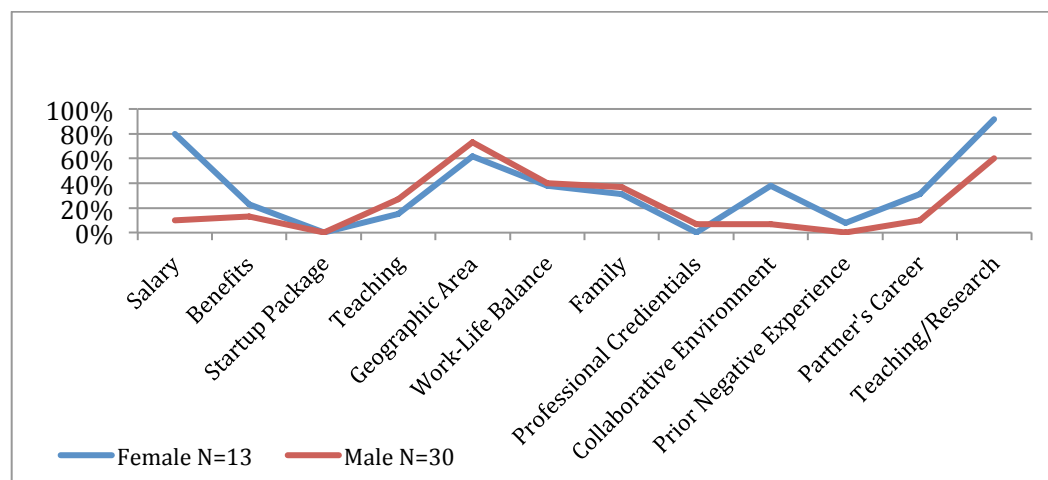


Figure 3. Important Considerations for Tenured Faculty

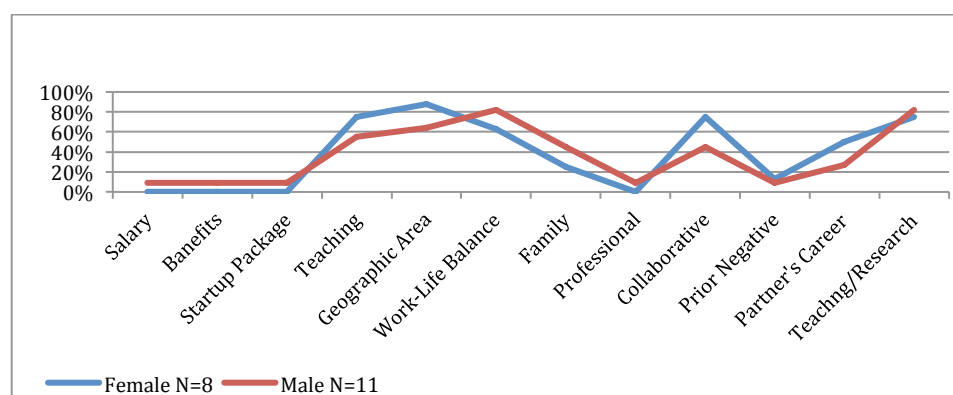


Figure 4. Important Considerations TT Faculty

Interestingly, faculty perceptions of their own participation rate is much different (see Figure 6) when they are comparing themselves to their peers. Male faculty perceive their service as more or much more than their colleagues (male or female).

Additionally, in all categories of committees, tenured women were less likely to act in a role of leadership than tenured men. The greatest difference was at the department level, where women were 25% less likely than men to act as a leader in decision-making committees (see Figure 7).

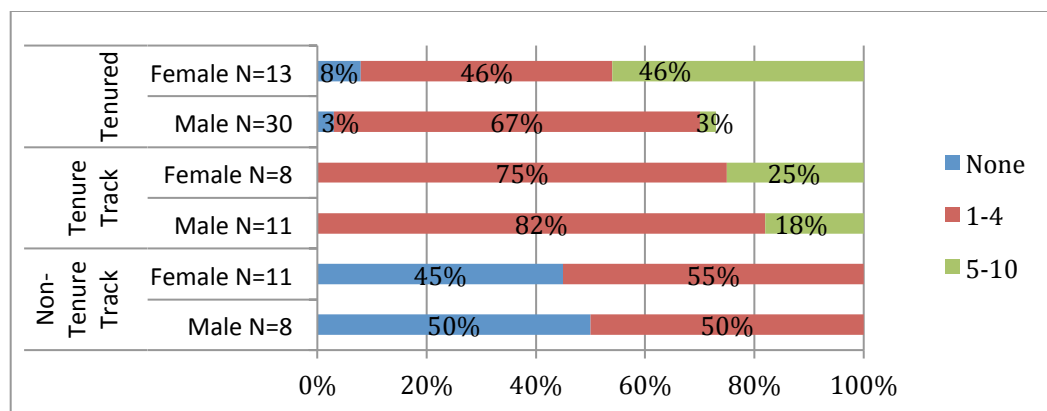


Figure 5. Participation on Committees This Year

When tenured faculty were asked to report their reasons for not acting in a leadership role, women were 14% more likely to say that they weren't asked, compared to tenured men, and 8% less likely than their male counterparts to report that they weren't interested. Twenty-three percent of women chose "other" as a reason for not acting in a leadership role, and 30% did not respond to this question. We do not fully understand the reason for the lack of specificity in the responses to this question.

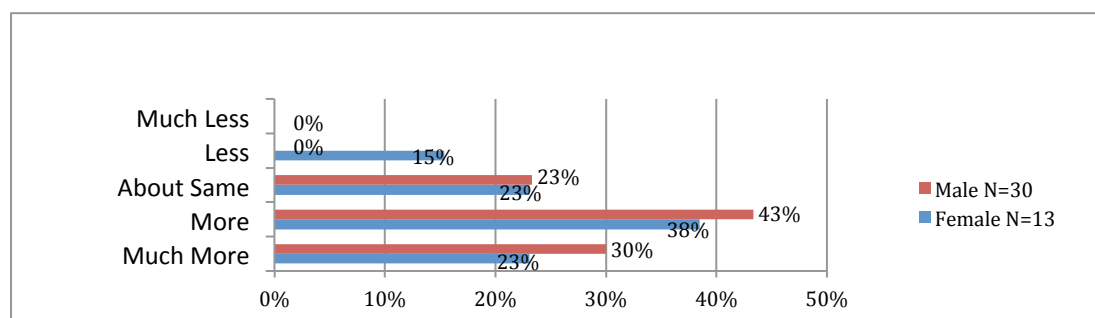


Figure 6. Faculty Perceptions of Participation

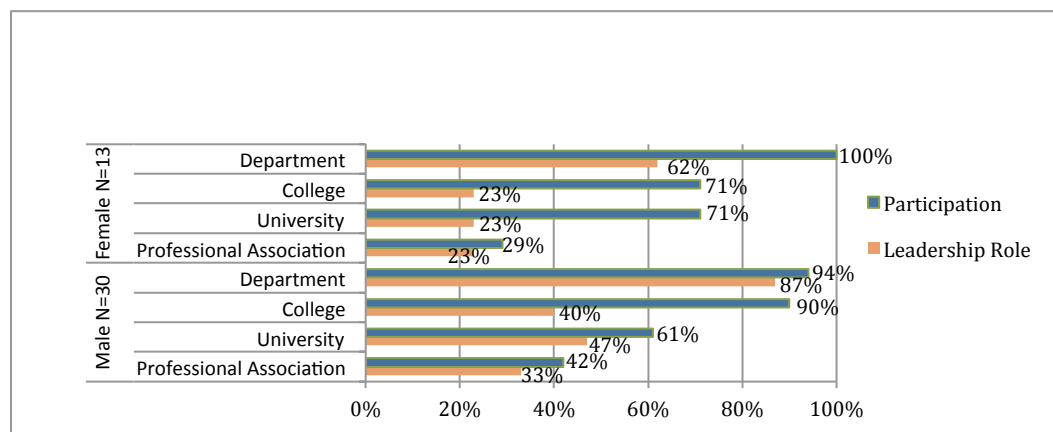


Figure 7. Tenured Faculty Opportunity for Leadership

Male and female TT faculty were more evenly matched with regard to leadership in decision-making committees within their departments, although women were 5% less likely than their male counterparts to act in the role of leader and 12% less likely to participate in decision-making committees at the department level. On the other hand, at the college level, men participated in decision-making committees at a higher rate, but were 13% less likely than TT women to act in a leadership role. A significant difference in leadership was also reported in professional associations, where men assumed leadership roles 27% more often than women. It should also be noted that most TT faculty now have mentors at Western, while mentoring of faculty was sparse, before the creation of CST.

Female TT faculty represent the highest percentage of faculty (63%, see Figure 9) presenting scholarship at professional conferences once a year, when compared to their male counterparts and compared to male and female tenured faculty. On the other hand, female tenured faculty reported spending the least amount of time on presenting research (16% of their work-load activities). Almost a quarter of the tenured women responded that they presented their work at conferences only once every five years, while almost another quarter responded they participated at conferences more than once a year (see Figure 9). We speculate that some tenured women's service obligations may be interfering with their scholarly work and productivity. Because of the way we collected our data (to protect privacy), we do not have the data to verify this, and thus, the point remains as speculation. But, we do not see these trends in other faculty groups.

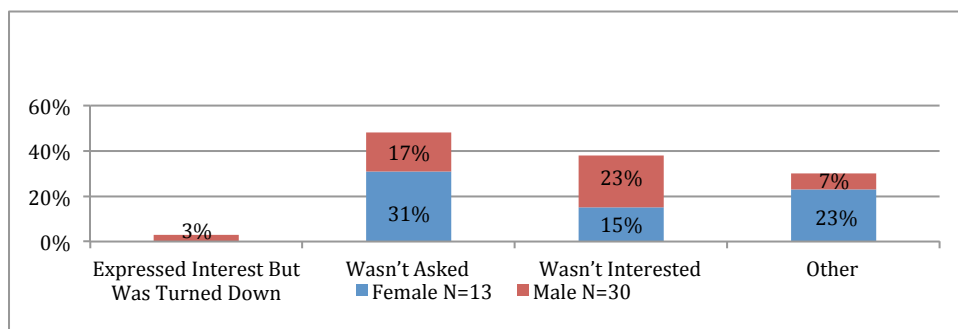


Figure 8. Tenured Faculty Reported Reasons for Lack of Leadership Opportunity

Additionally, the tenured faculty is the only group that reports any negative impact of service on their career (see Figure 10). Female tenured faculty, who report the highest participation in service activities, also report the highest percentage of faculty (nearly a quarter) who believe service activities have negatively impacted their career.

Faculty were asked to explain their perception of the negative effects of service activities. Some commented that service directly impacted time for teaching and research, while others were concerned that time spent doing service that did not directly impact their home department did “not count” toward promotion or tenure. Concern was expressed regarding the unfairness in distribution of service commitments, and the lack of awareness on the part of leadership as to how much time is spent on service.

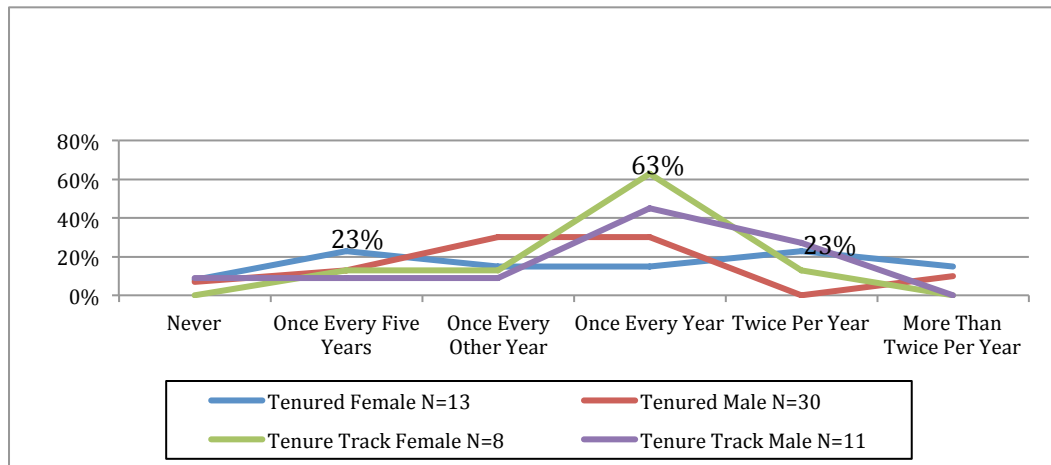


Figure 9. Average Frequency of Presenting Scholarship for Past Five Years

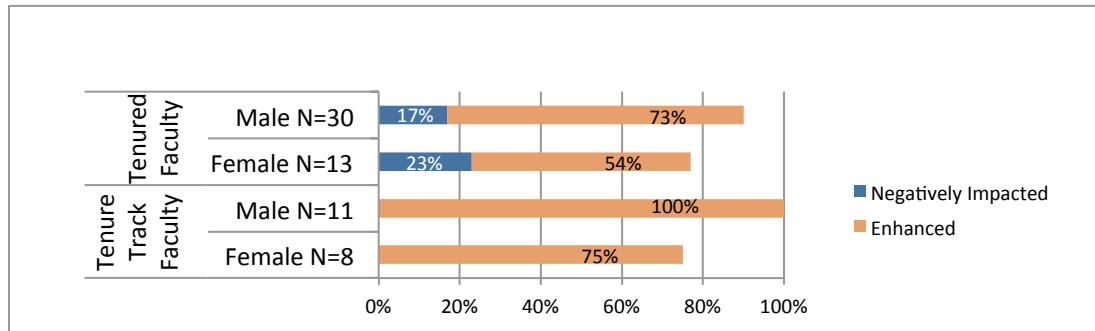


Figure 10. Impact of Service Activities on Careers

A number of questions in the survey focused on the equal opportunity (EO) climate in both their department and within CST, and how included faculty feel in the day-to-day workings of their department. The NTT women responded less positively than their male counterparts, and less positively than male and female faculty of other ranks, about their perceptions of the EO climate in their department. The largest difference in male/female responses was also found within the NTT faculty. While this result is not that surprising, it does speak to reasons to be inclusive of NTT women in ADVANCE initiatives.

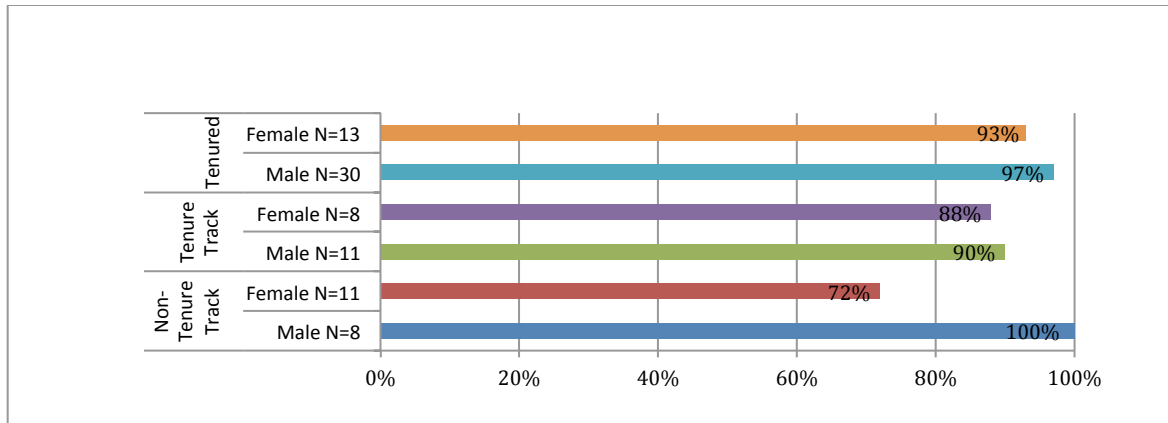


Figure 11. Faculty Perception of Equal Opportunity Climate

There were more female tenured faculty (31%) who said they sometimes or usually observed or perceived discrimination based on gender in the work environment, than their male or female counterparts in either the same rank or any other rank. Figure 12 shows one hundred percent of the male NTT faculty answered “never” to this question and male and female members of all other ranks had varying responses to “rarely” (ranging from 36% of the NTT women to 15% of the tenured women faculty).

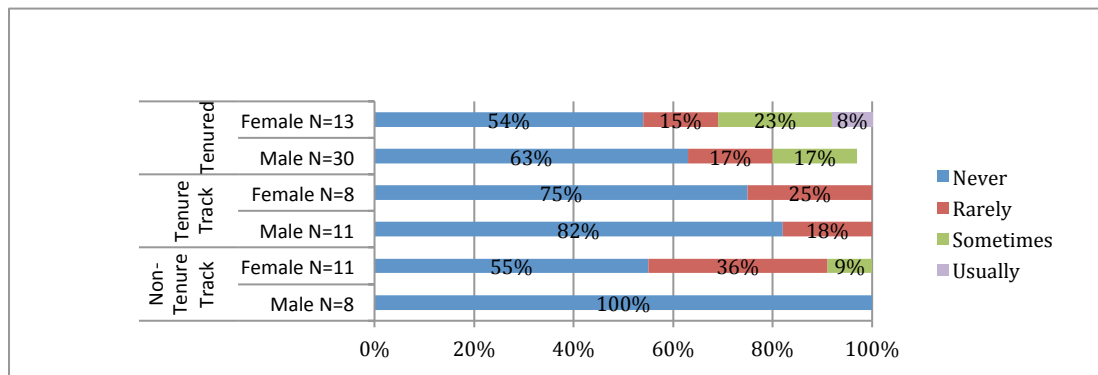


Figure 12. Faculty Who Observed or Perceived Discrimination Based on Gender

When asked a similar question in regards to perceiving sexual harassment, specifically in the work environment in the last five years, the female tenured faculty were again more likely to say “sometimes” (23%), compared to only 7% of their male peers. (see Figure 13).

When combining women faculty across all ranks, 15% agreed they had been the subject of sex discrimination at Western within the last five years, compared to 0% of males across all ranks (See Figure 14). As in the previous question, only women, (again across all ranks) reported that they had been the subject of sexual harassment (6% See Figure 15) at Western over the last 5 years.

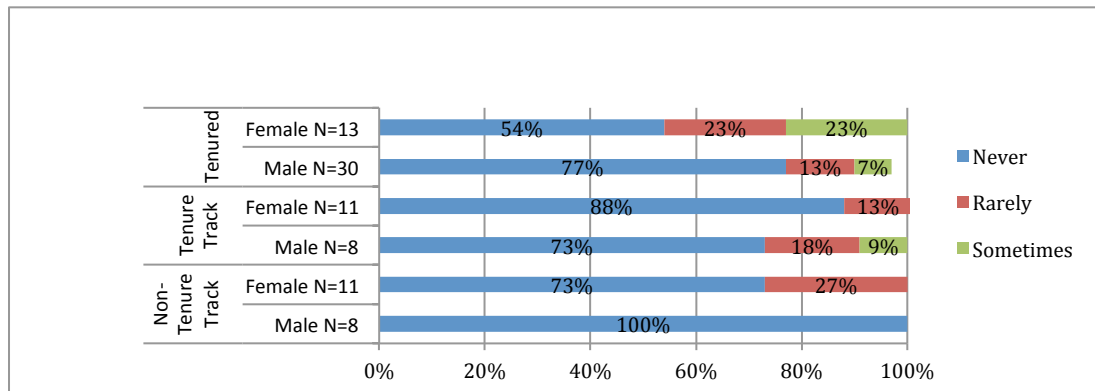


Figure 13. Faculty Who Observed or Perceived Sexual Harassment

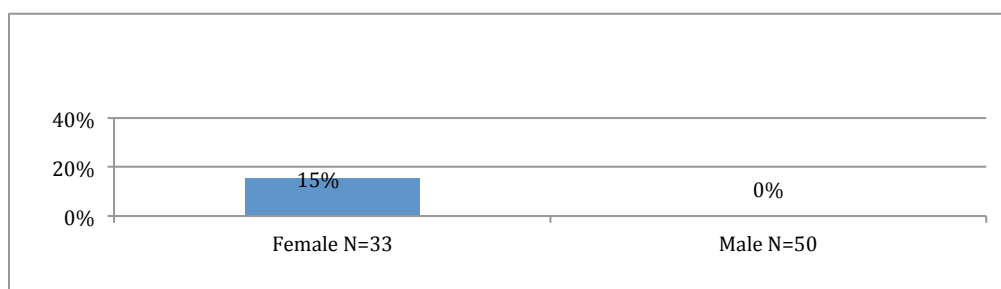


Figure 14. Faculty Who Believe They Have Been the Subject of Discrimination Based on Sex

Of the 15% of women who reported discrimination based on sex in the climate survey, and the 6% of women who reported sexual harassment, 0% reported that they filed a formal complaint. A few faculty indicated why the female faculty members did not report the incident by checking either the “I was fearful of retaliation” or “I didn’t want to be seen as a complainer” box. Others commented that the discrimination came from outside people or from near retired faculty or that their perception was that reporting the incident “was useless”. It should be noted that complaints are taken very seriously at Western Washington University at all levels of the institution.

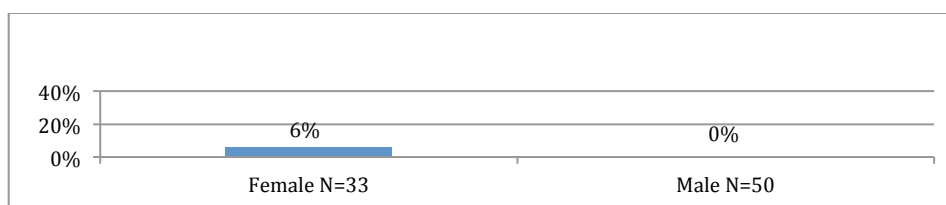


Figure 15. Faculty Who Believe They Have Been the Subject of Sexual Harassment

In response to a more general question about reluctance to bring up issues of any kind for fear it would affect their performance evaluation, more than a third of the NTT women had this concern. Interestingly, a little over a quarter of the TT male faculty also had this same concern (See Figure 16).

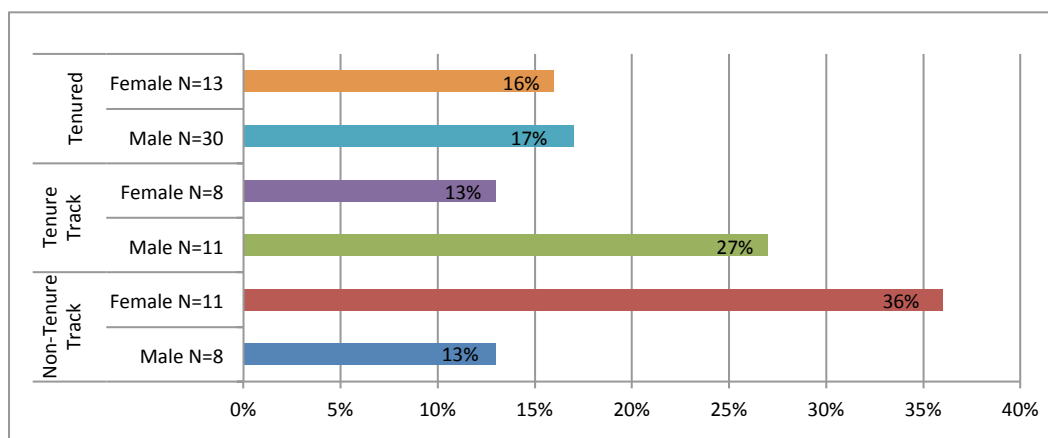


Figure 16. Faculty Who are Reluctant to Bring Up Issues

Nearly half of the NTT faculty (45%) agreed that they felt isolated in their departments, compared to 31% of their female tenured faculty and 0% of their female TT peers. While no TT women reported feeling isolated in their departments, about a quarter of TT men and NTT men did feel isolated, as did 31% of tenured women faculty.

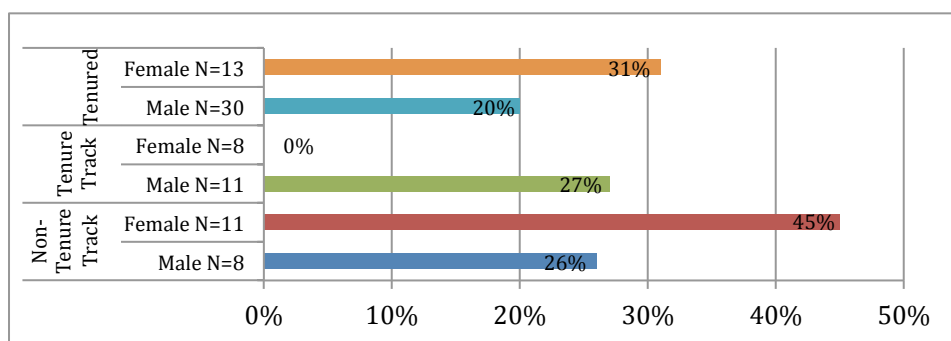


Figure 17. Faculty Who Report Feeling Isolated in Their Department

Next Steps

At this point, based upon the findings so far of the many components of our project, that the next step on our campus to respond to the issues raised in our project should be a Faculty Advancement Center (FACT) with career span initiatives as its centerpiece. Based on what we have learned, there is a need for a comprehensive set of initiatives that would address the complex and interrelated barriers affecting the advancement of female faculty. We also believe that in the long-term it will be imperative to have a staffed, physical center, coordinated by actively involved faculty leaders, in order for FACT to be demonstrably effectual and sustainable.

We plan as our first step a virtual web-based center. FACT would bring together existing resources and programs and initiatives underway at Western, along with new ADVANCE initiatives into an integrated, accessible framework to support faculty, especially those whose careers have been the most impacted by our changing mission. Our overarching theme would be based upon the University of Michigan's "General Principles of Effective Leadership -

Transparency, Uniformity, and Assistance”³⁵⁻³⁶. FACT’s leadership will include senior faculty as well as emerging campus leaders. Important components of our program will include initiatives for our women NTT faculty. FACT initiatives will encompass: chair leadership and development (already initiated), mentoring (under consideration and analysis), mid-career initiatives, future leader development, teaching development (components in-place), diversity in hiring (in-place), work-life balance initiatives (in development and on-going), and enhancing awareness and sensitivity regarding equity and inclusion (on-going and being enhanced). FACT activities could include: staff support, resource development, resource management, resource referral, continuation of all in-place activities, and an assessment plan. At this point in the project, mid-career initiatives would be the priority.

Faculty Advancement Center (FACT)		
	Career Span Support	Enabling Career Transitions
Leadership	Department Chair Leadership Development Chair Toolkit /Workshops/ Ongoing Center Support	Developing Future Leaders Workshops/Visiting Scholars/Faculty Release
Development	Mentoring Tool Kit/Training/Ongoing Support with Course Release for Rotating Faculty Coordinator	Teaching/Scholarship Grants/Training/Mentoring
Balance	Policies/Benefits Brochure/Website/Resource Referral/Ongoing Support from Center Staff	Climate: Diversity, Inclusion, Equity Hiring Committees, Toolkit/Workshops, Personal Workload Activities Dashboard, Enhancing Equitable and Inclusive Climate

Figure 18. Possible Scope for FACT Based Upon Faculty Brainstorming Sessions

We would like to model our initiatives after specific best practices: Formal Mentoring (University of Michigan¹⁸), Chair and Future Leader Development (University of Wisconsin¹⁹ and the University of Washington¹⁷), Career Span (Hunter College²⁰), Teaching Innovation (New York University), Work-Life (University of Michigan¹⁸), and Diversity in Hiring (University of Michigan, Strategies and Tactics for Recruiting to Improve Diversity and Excellence –STRIDE program¹⁸).

Measurements and feedback mechanisms proposed thus far to evaluate the effectiveness of FACT could be: user surveys, retention studies, post tenure reviews (PTR), advising of students, activities dashboard, and center visit data. We believe that the infrastructure and initiatives

proposed are imperative for career development of women faculty at all comprehensives and we hope our Center could become a leading model for other similar institutions.

Acknowledgements

We would like to acknowledge and thank the National Science Foundation for the support of our ADVANCE Catalyst initiative (NSF Grant #0811257). We especially thank Debra Young, our Research Associate on the program, for her dedicated work on the program, her analysis of the data, and the creation of the figures/analysis presented in this paper and in our numerous reports/presentations. We would also like to thank our Faculty Leadership team, and especially the leadership and numerous contributions of Dr. Karen Bradley (Sociology). Our Faculty Leadership team included: Dr. Joann Otto (Chair, Biology), Dr. Kristen Larson (Physics/Astronomy), Dr. Debra Jusak (Computer Science), Dr. Robert Mitchell (Geology), Professor Todd Morton (Engineering Technology), Dr. Elizabeth Raymond (Chemistry), and Dr. Jose Serrano-Moreno (Biology). We would also like to thank the senior leadership at our institution, especially Provost Catherine Riordan, for their continued support of our programs and ADVANCE initiatives.

Bibliography

1. ADVANCE Portal, Climate: <http://www.portal.advance.vt.edu/index.php/categories/initiatives/climate-and-culture>
2. <http://www.advance.rackham.umich.edu/climatesurvey.pdf>
3. http://www.uic.edu/depts/oa/faculty/Faculty_Work_Climate_Survey.pdf
4. <http://www.case.edu/provost/raa/raafacultysurveys.html>
5. <http://wiseli.engr.wisc.edu/facworklife.php>
6. Axio Survey - Kansas State University advance.ksu.edu/file_download/17/climateinstrument.pdf
7. National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine, Beyond Bias and Barriers, Fulfilling the Potential of Women in Academic Science and Engineering, The National Academies Press, Washington, D.C., 2007.
8. National Science Foundation, Congressional Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development. 2000. *Land of Plenty: Diversity as America's Competitive Edge in Science, Engineering, and Technology*. Arlington, VA.
9. Etzkowitz, H., Kemelgor, C., and Uzzi, B., *Athena Unbound: The Advancement of Women in Science and Technology*. 2000, New York, Cambridge University Press.
10. Heilman, M., "Description and Prescription: How Gender Stereotypes Prevent Women's Ascent Up the Organizational Ladder." *Journal of Social Issues* 57, 2001, pages 657-74.
11. Kalev, A., Dobbin, F., and Kelly, E., "Best Practices or Best Guesses? Diversity Management and the Remediation of Inequality." *American Sociological Review*. 71, 2006, pages 589-917.
12. Kulis, S., Sicotte, D. and Collins, S., "More Than a Pipeline Problem: Labor Supply Constraints and Gender Stratification Across Academic Science Disciplines." *Research in Higher Education* 43, 2002, pages 657-691.
13. National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. Committee on Maximizing the Potential of Women in Academic Science and Engineering and the Committee on Science, Engineering, and Public Policy. 2006. *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*. Washington, D.C.: The National Academies Press.
14. National Science Board. 2006. *Science and Engineering Indicators 2006*. Two volumes. Arlington, VA: National Science Foundation (volume 1, NSB 06-01; volume 2, NSB 06-01A).

14. Fuchs, D., Tamkins, M., Heilman, M., and Wallen, A. S., "Penalties for Success: Reactions to Women Who Succeed at Male Gender-Typed Tasks." *Journal of Applied Psychology* 89, 2004, pages 126-127.
15. Marschke, R., Laursen, S., McCarl Nielsen, J., and Patricia Rankin. "Demographic Inertia Revisited: An Immodest Proposal to Achieve Equitable Gender Representation among Faculty in Higher Education." *Journal of Higher Education* 78, 2007, pages 1-26.
16. Umbach, P., "Gender Equity in the Academic Labor Market: An Analysis of Academic Disciplines." *Research in Higher Education*, 48, 2007, pages 169-192.
17. University of Washington, ADVANCE, <http://www.engr.washington.edu/advance/>
18. University of Michigan, ADVANCE, <http://sitemaker.umich.edu/advance/home>
19. University of Wisconsin, ADVANCE, <http://wiseli.engr.wisc.edu/>
20. Hunter, ADVANCE, <http://www.hunter.cuny.edu/genderequity/>
21. Utah State ADVANCE, <http://advance.usu.edu/>
22. Building Engineering and Science Talent, A Bridge for All: Higher Education Design Principles to Broaden Participation in Science, Technology, Engineering, and Mathematics, 2004. See www.bestworkforce.org
23. Wright, M., "Always at Odds? Congruence in Faculty Beliefs about Teaching at a Research University" *Journal of Higher Education* 76, 2005, pages 331-353.
24. Long, J. S., editor, *From Scarcity to Visibility: Gender Differences in the Careers of Doctoral Scientists and Engineers*, Washington, D.C., 2001, National Academy Press.
25. Gaughan, M., editor, *Journal of Technology Transfer*, Special Issue, Women in Science. 31, 2006, pages 307-396.
26. Lamont, M., Kalev, A., Bowden, S., and Fosse, E. 2004. "Recruiting, Promoting, and Retaining Women Academics: Lessons from the Literature." Prepared for the Standing Committee for the Status of Women, Faculty of Arts and Sciences, Harvard University, 2004, <http://www.wjh.harvard.edu/~mlamont/lessons.pdf>
27. Sturm, S., "The Architecture of Inclusion: Advancing Workplace Equity in Higher Education", *Harvard Journal of Law and Gender*, 29, 2006, pages 247- 334.
28. Lee, J. J., "Comparing Institutional Relationships with Academic Departments: A Study of Five Academic Fields", *Research in Higher Education*, 45, 2004, pages 603-624.
29. Williams, J., "Hitting the Maternal Wall." *Academe*, 90 (7 pages), 2004, Retrieved December 3, 2006. <http://www.aaup.org/publications/Academe/2004/04nd/04ndtoc.htm>
30. Rosser, S. V., *The Science Glass Ceiling: Academic Women Scientists and the Struggle to Succeed*, 2004, New York, Routledge.
31. Spalter-Roth, R. and Erskine, W., "Beyond the Fear Factor: Work/family Policies in Academia – Resources or Rewards?" *Change*, November/December, 2005, pages 19-25.
32. Thompson, Mischa and Denise Sekaquaptewa, "When Being Different Is Detrimental: Solo Status and the Performance of Women and Racial Minorities", *Analyses of Social Issues & Public Policy*, 2, 2002, pages 183-20.
33. Weiss, A., *The Glass Ceiling, 21st Century*, 1999.
34. "A Matter of Degrees: Female Underrepresentation in Computer Science Programs Cross-Nationally." (with Maria Charles, UCSD) In Joanne McGrath Cohoon and Bill Aspray, eds. 2006. *Women and Information Technology: Research on the Reasons for Underrepresentation*. Cambridge, MA: MIT Press.
35. http://sitemaker.umich.edu/advance/creating_a_positive_departmental_climate
36. Waltham, J. and Hollenshead, C., "Creating a Positive Departmental Climate: Principles for Best Practices", The Center for the Education of Women, the University of Michigan, ADVANCE.