

**Establishing the Foundation for Future Organizational Reform and Transformation:  
Status of Women Faculty at RIT Regarding Recruitment, Representation, and  
Advancement**

<http://nsfadvance.rit.edu/>

*Report to the  
Rochester Institute of Technology Community*

**Submitted by the NSF EFFORT@RIT Grant Team**

(NSF # 0811076, ADVANCE Institutional Transformation - CATALYST)

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## Executive Summary

The research objective of the NSF ADVANCE IT-Catalyst project, “Establishing the Foundation for Future Organizational Reform and Transformation at Rochester Institute of Technology” or simply EFFORT@RIT (#0811076, 8/1/08 – 7/31/12, \$199,770, <http://nsfadvance.rit.edu/>) was to identify barriers for current women faculty at RIT in regards to rank, tenure, career advancement, leadership role progression, and resource allocation. During the study, the research team sought answers to six primary research questions: 1) What is the distribution of STEM faculty by gender, rank, and department? 2) What are the outcomes of institutional processes of recruitment and advancement for men and women? 3) What is the gender distribution of faculty in leadership positions? 4) What is the allocation of resources for faculty? 5) Are there barriers to the recruitment and advancement of women? 6) How successful are existing structures at addressing these barriers? The study focused on RIT colleges including departments of computing, science, technology, engineering, and mathematics disciplines and where possible and practical, extended the focus to the remaining colleges and other non-STEM departments due to the integral role each serve within this technologically focused university.

Climate survey results, in conjunction with the objective data review and benchmarking information, led to the identification of barriers to the recruitment and advancement of women faculty involving *career navigation*, *climate*, and *flexibility/options for managing the work/life balance*. Issues related to career navigation could be caused by women’s self-agency and negotiation skills, coupled with a lack of “sponsorship” from more seasoned faculty and/or administration, hinder the success of female faculty in obtaining more advantageous starting packages, assignments, compensation, and promotion. Climate issues are exacerbated by female’s view of the workplace in personal terms, as opposed to a more male process-oriented view, meaning that issues of connectedness, support, and interpersonal relations, are important to their success. Overall satisfaction for men and women is tied to faculty perception of value and influence, and to a lesser extent to one’s view of the department climate and work/life balance. Finally, managing work/life balance through flexible work arrangements, available and convenient child care, and tenure clock adjustments, may lower stress and increase satisfaction, and potentially aid in the retention of female (and male) faculty.

This study sought answers to each research question and the following report summarizes evidence-driven results and conclusions for each. Based on the findings, a list of detailed recommendations are offered which will afford RIT the opportunity to systematically track and report on data related to the representation, advancement, and recruitment of women faculty at RIT. To promote the success and advancement of women faculty at RIT, other recommendations are aimed at enhancing or implementing new programs and policies which stem from the study’s findings. Recommendations that follow seek to address barriers to the recruitment, representation, and advancement of women faculty at RIT by building on existing institutional structures as well as developing and integrating new structures.

## Recommendations

The research team created several recommendations as a result of this self-study. The following are **recommendations which have resulted in actions taken** by various RIT faculty and/or administrative units as noted in the *italicized text* below.

- Create a comprehensive institutional transformation strategy to address research findings from this self-study with a goal of increasing the representation, retention, and advancement of women faculty at RIT.  
*Progress: Institutional transformation strategy submitted for funding consideration to the NSF ADVANCE Institutional Transformation program in NOV 2011 by a group of RIT faculty including M. Bailey - KGCOE, S. Mason - GCCIS, C. Marchetti - COS, M. Valentine - CAST, J. Hatala - CAST, S. Baum – COS, K. Crawford - CLA, S. Foster – NTID, and D. Blizzard.*
- Launch RIT Faculty Mentoring Network Program.  
*Progress: University-level faculty mentoring program roll-out began in AY2011 including program assessment activities.)*
- Support Faculty Exit Interview Procedure and Survey Instrument.  
*Progress: Program has been under development by Human Resources and Academic Affairs since AY 2010.*
- Conduct annual faculty salary studies by gender and race/ethnicity and begin to build transparency around this issue and the salary study results.  
*Progress: Annual faculty salary studies have occurred since summer/fall 2010 by Human Resources, Institutional Research, and Academic Affairs.*
- Establish a tenure-clock extension policy to accommodate faculty going through challenging work/life balance periods.  
*Progress: Charge presented to Academic Senate and forwarded to Faculty Affairs Committee to consider revising the tenure policy (E5.0) to broaden and clarify the tenure-clock extension provisions. This effort is ongoing into AY2012.*
- Establish a broadened set of practices around the dual career employment issue and widely disseminate this information to current faculty and interested prospective faculty.  
*Progress: Conceptual design of dual-career hire practices and procedures are under development by Human Resources and Academic Affairs (started in AY 2011).*
- Conduct faculty climate surveys on a regular basis such as every three years.  
*Progress: The COACHE faculty climate survey administered through Harvard will be conducted at RIT in the fall of AY2012.*
- Maintain websites related to project and work/life balance.  
*Progress: Active websites*
  - RIT ADVANCE website located at <http://nsfadvance.rit.edu/>.
  - Work/Life resources page at <http://finweb.rit.edu/humanresources/benefits/greatplace.html>

The following recommendations which resulted from the self-study **have not yet been addressed**:

- Create a reporting structure to communicate data-driven, organized answers to the four research questions in order to inform the RIT community, aid in transparency, and

communicate the importance of eliminating barriers that exist at RIT in regards to the recruitment, retention, and advancement of women faculty.

- Collect, analyze, and report data necessary to answer NSF ADVANCE research questions 1-4, namely [37]:
  - STEM designations for all academic units at RIT
  - Number of men and women tenured and tenure-track faculty by terminal degree, college, department, rank, STEM designation, and race/ethnicity
  - Number of non-tenured men and women faculty (e.g., Instructional, Research, Postdoctoral) by college, department, rank and race/ethnicity (periodic)
  - Number of faculty who submit tenure packets, and number awarded tenure, by gender, race/ethnicity, terminal degree, college, and department
  - Number of faculty who apply for promotion, and number promoted, by gender, race/ethnicity, department, college, terminal degree, and promotion transition - assistant to associate; associate to full
  - Number of tenured associate professors by department, college, terminal degree, race/ethnicity, and gender with years-in-rank in six, 3-year categories
  - Number of faculty who leave their departments, excluding those who died or retired, by rank, gender, race/ethnicity, college, and department
  - Number of faculty hired by rank, gender, race/ethnicity, college, and department
  - Cohort analyses of tenure and promotion, including to full professor (periodic)
  - Number of scientists and engineers in leadership positions by rank, race/ethnicity, gender, and college
- Create database of start-up packages (starting salary, summer support, graduate student support, space allocations, equipment allotments, start-up funds, etc.) and report aggregate start-up package data along with other answers to the four research questions.
- Annually benchmark benefits, policies, and resources found to be important to women faculty against other appropriate universities in order to uncover gaps and best practices.
- Clearly establish and define a faculty maternity leave policy beyond a definition of the Family Medical Leave Act.
- Examine the current flexible working arrangements (part-time employment) and the alternative work arrangements (job-sharing, working from off-campus, etc.) available for faculty at RIT. Identify the ease of subscribing to these arrangements and the impact on career advancement and compensation. Revise procedures as necessary and disseminate this employment option to the RIT faculty in an effective manner.
- Extend hours of operation of the on-campus child care facility and explore possibility of near-campus facility extending hours of operation in order to provide child care during evening hours and on holidays and weekends when classes are in session or graduation events are underway.

## 1. Background

In 2010, RIT employed 95 women tenured and tenure-track (T TT) faculty in the science, technology, engineering, and mathematics (STEM) disciplines, or 22.8% of the total STEM T TT faculty (Table 1). An additional 33 women T TT faculty were employed within the social and behavioral sciences (SBS) which constituted 36% of the total SBS TT faculty (Table 1). Overall in 2010, RIT employed 128 women T TT faculty within STEM and SBS which represented 25% of this faculty population. This value is significantly below the 34% average of doctoral scientists and engineers employed at Master's granting colleges and universities in the U.S. [1]. A comparison (Table 2) of RIT's women faculty representation to national availability data [1] reveals low levels except for computer science, in which a high percentage of RIT women T TT faculty within Golisano College of Computing and Information Sciences have master's degrees as their highest degree (a relic of past hiring practices). RIT's STEM colleges have made strides in recruiting women faculty, and the number of STEM women faculty has nearly tripled in the past 15 years as the size of the RIT faculty has grown, although the representation of women STEM T TT faculty has increased slowly from 15.9% in 1995 to 22.8% in 2010. There is also variability in the representation of women faculty members between STEM departments even within the same college. For example in October 2010, within the College of Science there was a large disparity between the percentage of women faculty within life and physical sciences with representations of 43% (15/35) and 13% (5/39), respectively. Both representations are significantly below national availability and the gap between the values is larger than expected based on the national trends [2]. In addition there were five academic STEM units in October 2010 with no female T TT faculty.

**Appendix A** lists all academic units at RIT which are considered STEM and SBS for this study.

In general, women faculty tend to be successful in terms of securing supporting types of high-level administrative positions, accounting for 67% of associate/vice dean positions in the predominately STEM colleges during 2011. However this same year, just 20% (2/10) of dean positions at RIT were held by women. In 2010, 23% of the STEM leadership positions were held by women faculty, aligning with their representation in STEM. However, women faculty overall at RIT held 25% of leadership positions, which lags their overall representation.

Prior work done at RIT to assess climate includes a 2002-03 climate study conducted by the Center for Governmental Research [3], which contained a small subset of questions to assess the climate for women, and a series of focus groups conducted during Spring 2005 with RIT women faculty. Key findings from this earlier work related to STEM and non-STEM faculty include:

### Earlier Climate Study Results

- 15-20% of male and 34% of female faculty respondents felt the campus tends towards being sexist.
- 65% of female faculty respondents did not agree that the tenure process is fair for all compared to 54% of all faculty who shared the same opinion.
- 75% of male faculty, but only 56% of female faculty respondents indicate, "Women feel comfortable at RIT".

### Focus Group Observations

- Overall, RIT provides a very good environment in which to work, and the environment has improved over time, in part due to administrative initiatives.
- Contribution of women faculty is devalued.
- Work-life balance is either a challenge or strength (variable across campus, and strongly dependent on college/department).
- Women seem to lack the ability to negotiate/advocate for resources.
- Initial male student perception of women faculty is poor (i.e., women faculty must prove themselves).

**Table 1. Tenured and Tenure-Track Women Faculty in STEM and SBS at RIT**

College <sup>4</sup>	Number of Women Faculty (Tenured and Tenure-Track) <sup>1</sup>						
	# Women Faculty 1995	# Women Faculty Oct 08	# Women Faculty Oct 10	% Women Faculty 2010	Asst: % Women RIT <sup>3</sup>	Assoc: % Women RIT <sup>3</sup>	Full: % Women RIT <sup>3</sup>
KGCOE	4	8	10	12.4%	17.4%	7.1%	13.3%
CAST <sup>2</sup>	3	7	11	19.3%	35.7%	4.8%	22.7%
GCCIS	5	23	26	27.7%	33.3%	34.1%	13.8%
COS	19	29	32	23.7%	36.7%	26.8%	15.6%
NTID <sup>2</sup>	n/a	12	11	32.4%	35%	40%	0%
CIAS <sup>2</sup>	n/a	4	3	25%	0%	66.7%	25%
GIS	n/a	0	2	50%	100%	0%	n/a
STEM Dean's Offices	1	3	5	45.5%	n/a	n/a	45.5%
<b>Total Women STEM Faculty</b>	<b>32</b>	<b>86</b>	<b>95</b>	<b>22.8%</b>	<b>31.3%</b> (36/115)	<b>23.7%</b> (35/148)	<b>15.6%</b> (24/154)
<b>Total Women SBS Faculty</b>	<b>n/a</b>	<b>31</b>	<b>33</b>	<b>36%</b>	<b>43%</b> (13/30)	<b>43%</b> (16/37)	<b>17%</b> (4/24)
<b>Total Women STEM/SBS Faculty</b>	<b>n/a</b>	<b>117</b>	<b>128</b>	<b>25%</b>	<b>34%</b>	<b>28%</b>	<b>16%</b>

<sup>1</sup> Represents Teaching (as opposed to Research) Faculty

<sup>2</sup> Data listed is for a subset of departments within college classified as STEM.

<sup>3</sup> Represents percentage of women faculty at each rank within each STEM college

<sup>4</sup> Kate Gleason College of Engineering (KGCOE), College of Applied Science and Technology (CAST), Golisano College of Computing and Information Sciences (GCCIS), College of Science (COS), National Technical Institute for the Deaf (NTID), College of Imaging Arts and Sciences (CIAS), Golisano Institute for Sustainability (GIS)

A number of studies published in the literature have resulted in similar lists of barriers that are faced by women in the STEM fields and reasons why women may leave these jobs. These report that women in science and engineering have found “balancing work with family responsibilities” to be their most significant challenge; for women engineers this was followed by “gaining

credibility and respectability,” and “isolation/lack of camaraderie or mentoring,” Interviews with men and women leaving and staying in science and engineering careers [4] revealed that one third of the women left due to lack of guidance and 73% cited mentoring as an important factor in their careers. Conversely, the presence of a mentor for men did not significantly affect whether or not they left their career/degree program, although 65% of men reported having mentors in graduate school, compared with just 20% of women.

**Table 2. Comparison of Representations of RIT Women T TT Faculty with National Availability**

	RIT % Women (2010)	National % Women
Engineering (not Engr. Tech.)	12%	21.6%
Physical Sciences	13%	29.3%
Computer Sciences	29%	22.0%
Mathematics and Statistics	16%	31.1%
Biological Sciences	43%	50.6%
Psychology	40%	72.0%
Social Sciences	36%	48.6%

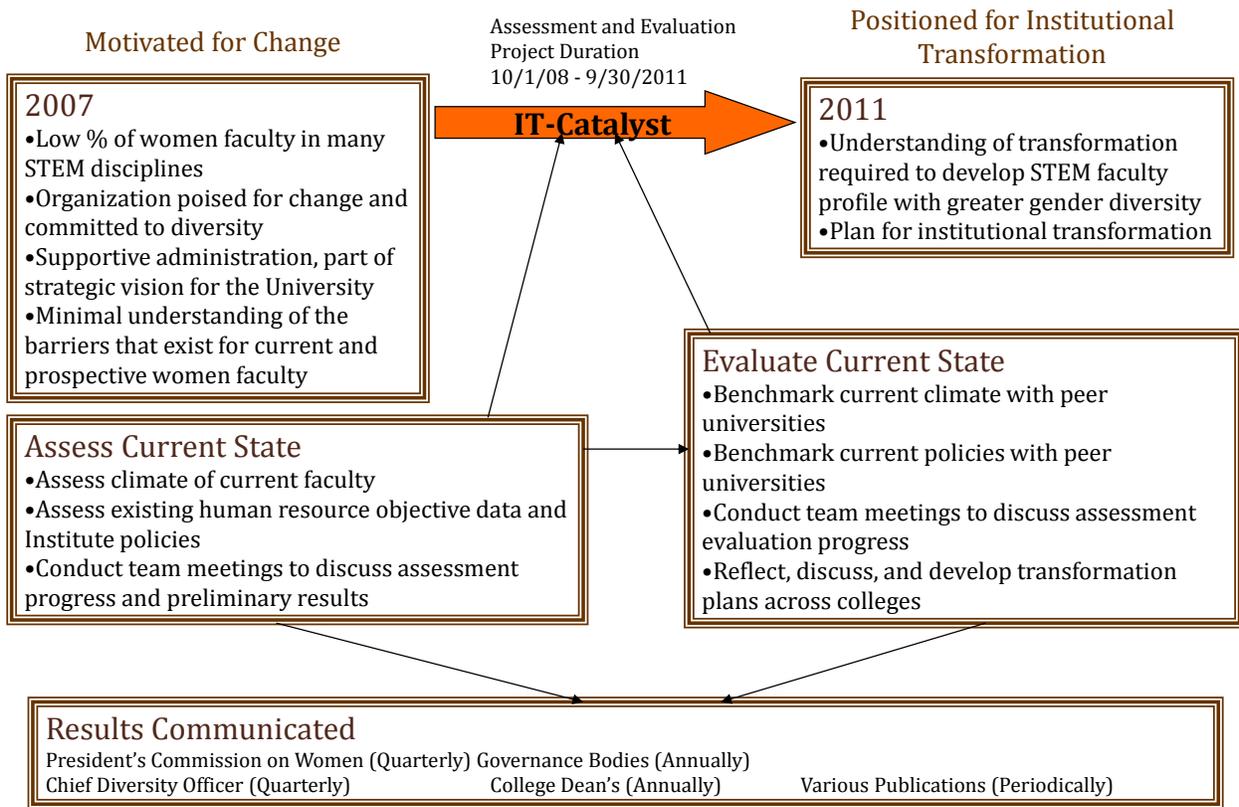
Women view the workplace in personal terms, as opposed to a more male process-oriented view, meaning that issues of connectedness, support, and interpersonal relations, are important to their success [5-8]. A compilation of the many reports of barriers facing women in academia shows that these challenges can be broken into two general categories: workplace issues and personal challenges. Workplace issues include feelings of isolation or marginalization [4,5, 9,10], lack of mentoring [4,5,9-12] and sponsorship by senior colleagues [13,14] that may lead to accumulated disadvantage over a career [15], a need to gain credibility or respect [5,16,17], unclear expectations for tenure and promotion [9,10], and biases ranging from subtle to open [9,10,18-20]. Personal challenges include: childbearing and childrearing decisions [9,21-24], balancing work/family time [9,20,24,25], and controlling overflow of work life into home life [26].

## 2. Research Approach

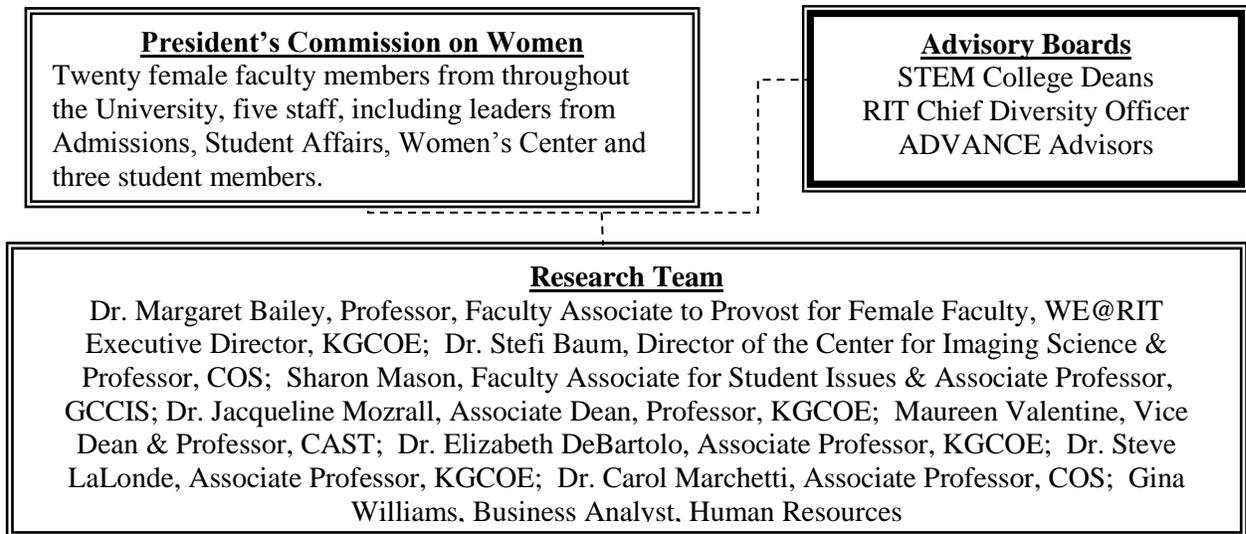
Based on preliminary findings, and supported by the literature, the research team developed a climate survey to collect more detailed information about the state of faculty, particularly women faculty, at RIT. A review of objective Human Resources Data was undertaken, and RIT’s policies and benefits were benchmarked against peer schools with a focus on elements that have been tied to potential barriers to recruitment, retention, and advancement of women faculty. The climate survey was developed using prior ADVANCE climate surveys as a guide. The survey was then administered at RIT in the fall of 2009.

Efforts to recruit, retain, and advance more women faculty members in the STEM fields at RIT must begin by answering several research questions. The project seeks to answer these questions and build strategies to address identified organizational weaknesses. Figure 1 shows the conceptual framework for the overall project. The organizational chart for the project is included within Figure 2. The project management team is inclusive of faculty leaders from the four largest STEM Colleges and a representative from Human Resources. Table 3 maps the project research questions to associated measures and/or methods.

**Figure 1. Activity Plan and Strategies**



**Figure 2. Project Management Structure**



**Table 3. Research Questions Mapped to Method(s) and Measures**

<b>Research Questions</b>	<b>Method</b>	<b>Measures</b>
<i>(1) What is the distribution of science and engineering faculty by gender, rank, and department?</i>	HR Obj. Data Review	<ul style="list-style-type: none"> <li>• Current number of faculty by department, rank, gender, and college (2004-2010)</li> <li>• Percentage of female by college (2004-2010)</li> <li>• Current number of non T TT faculty (2009)</li> <li>• Benchmark data (where available)</li> </ul>
<i>(2) What are the outcomes of institutional processes of recruitment and advancement for men and women?</i>	HR Obj. Data Review	<ul style="list-style-type: none"> <li>• Faculty applicant data by college (2007-2010)</li> <li>• Faculty hires (2004-2010) with comparison of applicants by gender, rank, and college (2007-2010)</li> <li>• Summary of TT acceleration or tenure credit upon hire</li> <li>• Tenure and promotion review outcomes by gender, department, and rank transition (2006-2010)</li> <li>• Cohort analysis of tenure and promotion, including to full professor (2006-2009)</li> <li>• Number of tenured Associate Professors by department and gender with years-in-rank, years in previous rank, and hired rank</li> <li>• Number of faculty who left their departments by rank, gender, and department (2004-2009)</li> <li>• Number of faculty voluntarily leaving before reaching tenure excluding retirements (2004-2009)</li> </ul>
<i>(3) What is the gender distribution of science and engineering faculty in leadership positions?</i>	HR Obj. Data Review	<ul style="list-style-type: none"> <li>• Number of men and women in leadership positions or on select committees (2009)</li> </ul>
<i>(4) What is the allocation of resources for science and engineering faculty?</i>	HR Obj. Data Review	<ul style="list-style-type: none"> <li>• Study of salaries of men and women faculty (averages based on rank then more detailed model with additional controls such as department, degree earned, years in rank; salary adjustments occurred in OCT 2010)</li> <li>• October 2008 Comparison of RIT Average STEM Salaries to CUPA Salaries by Discipline (for n &gt;5)</li> <li>• Study of Space Allocation and start-up packages of newly hired faculty by gender (data difficult to assemble)</li> </ul>
<i>(5) Are there barriers to the recruitment and advancement of women?</i>	HR Obj. Data Review RIT Faculty Work-Life Survey Institute Policy Review/Benchmark	<ul style="list-style-type: none"> <li>• Evaluation of results from research questions 1 – 4</li> <li>• Statistical analysis of responses to the RIT Faculty Work-Life Survey</li> <li>• Results of Institute Policy Review and Benchmark</li> </ul>
<i>(6) How successful are existing structures at addressing barriers to the recruitment and advancement of women?</i>	HR Obj. Data Review RIT Faculty Work-Life Survey Institute Policy Review/Benchmark	<ul style="list-style-type: none"> <li>• Evaluation of results from research questions 1 – 4</li> <li>• Statistical analysis of responses to the RIT Faculty Work-Life Survey</li> <li>• Results of Institute Policy Review and Benchmark</li> </ul>

### 3. Methodology

**3.1 Human Resources Objective Data Review:** Using data from the Human Resources Information System, counts of STEM, T TT faculty were developed for the periods of October 2004 through October 2010 to examine trends. Where more in-depth data was readily available, it was used to study areas including leadership, applicants, hires, attrition, promotion and tenure.

**3.2 Institute Policy Review and Benchmark:** The policy benchmarking activity was one of the earliest activities in the grant, providing a starting point for identifying areas that should be investigated further in the survey activity. A literature review identified several policy areas that are typically associated with cultural and gender diversity, including diversity statements, tenure policies, faculty mentoring programs, faculty awards, leave and grievance policies, procedures and benefits considered relevant to women seeking an academic position, and tuition support for family members.

RIT's policies and procedures were researched to determine whether or not these identified policies were in place. RIT's thirteen benchmark schools, as defined on the Human Resources website, were then investigated to determine if they had the policies in place. Four of the benchmark schools are also ADVANCE schools, which provided another comparison.

**3.3 Climate Survey Creation and Administration:** Over the course of the 2008 academic year, the project research team developed a comprehensive career-life survey focusing on gender issues in STEM. The team reviewed climate surveys previously developed and administered at other NSF ADVANCE institutions, primarily the survey developed at the University of Michigan [26] and the University of Wisconsin-Madison [27]. Questions from these surveys were adapted to meet the specific needs of the RIT environment. Additional questions were composed based on existing RIT culture and background. The survey was structured around four primary areas:

- Teaching, Resources, and Service
- Career Satisfaction, Work Load, Recognition
- Climate, Mentoring, Tenure, Promotion
- Balancing Personal and Professional Life

Four individuals with experience in assessment and evaluation, but not involved in this study as investigators or survey participants, tested the final survey instrument in a paper format for clarity of questions and categories, formatting and time requirements. Minor updates were made based on their feedback.

The Survey Research Institute (SRI) at Cornell University then coded the instrument to be offered to all tenure and tenure-track faculty at RIT via a secure website. The survey titled the "RIT Faculty Career Life Survey" was administered at RIT in the fall of 2009. To ensure confidentiality, SRI directly invited participation of RIT faculty by sending all email on behalf of the RIT administration (invitation plan included as Table 4), tracking respondents, communicating with non-respondents and collecting and aggregating data. Overall, more than 66% of all tenured and tenure-track faculty at RIT completed the survey (Table 5). To download the full RIT Faculty Career Life Survey, visit <http://nsfadvance.rit.edu/> or see **Appendix B**.

**Table 4. Survey Invitation Plan**

<b>Email Correspondence</b>	<b>Sent by</b>	<b>Date</b> (week number during 10-week academic quarter)
Invitation email from University President and Provost	SRI	OCT 1, 2009 (week 4)
First reminder email to non-respondents from President and Provost	SRI	Oct 14, 2009 (week 6)
Second reminder email to non-respondents from Provost	SRI	Oct 21, 2009 (week 7)
Third reminder email to non-respondents from Research Team	SRI	Oct 28, 2009 (week 8)
Fourth (final) reminder email to non-respondents from Research Team (indicating close date)	SRI	Nov 4, 2009 (week 9)

**Table 5. Survey Response Rates by Gender and College**

<b>Gender</b>	<b>Completions</b>	<b>Out of</b>	<b>Rate</b>
Female	175	245	71.43 %
Male	360	563	63.94 %
<b>Overall</b>	<b>535</b>	<b>808</b>	<b>66.29 %</b>

<b>College/Division</b>	<b>Completions</b>	<b>Out of</b>	<b>Rate</b>
Center for Integrated Manufacturing Studies	3	6	50.00 %
College of Applied Science and Technology	56	71	78.87 %
College of Imaging Arts and Sciences	55	100	55.00 %
College of Liberal Arts	83	124	66.94 %
College of Science	99	137	72.26 %
E. Philip Saunders College of Business	18	38	47.37 %
Golisano College of Computing & Info Sciences	68	92	73.91 %
Kate Gleason College of Engineering	62	85	72.94 %
National Technical Institute for the Deaf	87	147	59.18 %
Office of the President	1	1	100.00 %
Provost	3	6	50.00 %
Student Affairs	0	1	0.00 %
<b>Overall</b>	<b>535</b>	<b>808</b>	<b>66.29 %</b>

**3.4 Survey Data – Statistical Analysis Methodology:** The responses to each climate survey question were analyzed by gender where adequate sample size existed. Questions with numeric or Likert scale answers compared mean responses for males and females using a two-sample t-test. Questions with categorical response options compared proportions of males and females in each category using a chi-square test.

**3.5 Survey Data – Benchmarking Methodology:** The results of the RIT Faculty Work Life survey were benchmarked against climate survey results from other ADVANCE schools. The purposes of this benchmarking are to (1) determine whether problems with the work-life environment at RIT are unique to us or common to other institutions, (2) identify elements of the

work-life environment at RIT that are strengths relative to other ADVANCE schools, and (3) identify actions taken at other schools to address issues similar to those found at RIT (this work is ongoing). In the creation of the RIT Work-Life survey, instruments developed at other ADVANCE schools – in particular, the University of Michigan and University of Wisconsin-Madison – were used for reference. These schools’ results were then used for benchmarking.

**3.6 Salary Study – Statistical Analysis Methodology:** A modeling effort was undertaken to evaluate the following research question, “What is the allocation of resources for science and engineering faculty?” A series of linear regression models were developed using male faculty data then fitted to all faculty. Chi Square comparisons were run to see if female faculty tended to have more below the predicted salary than male faculty. Comparisons were generated for the entire population, by rank, by college, and by rank within college. Salary equity analysis was generated using available variables such as time in rank, college, terminal degree, gender, ethnicity, and length of service.

#### **4. Results to Research Questions 1-4**

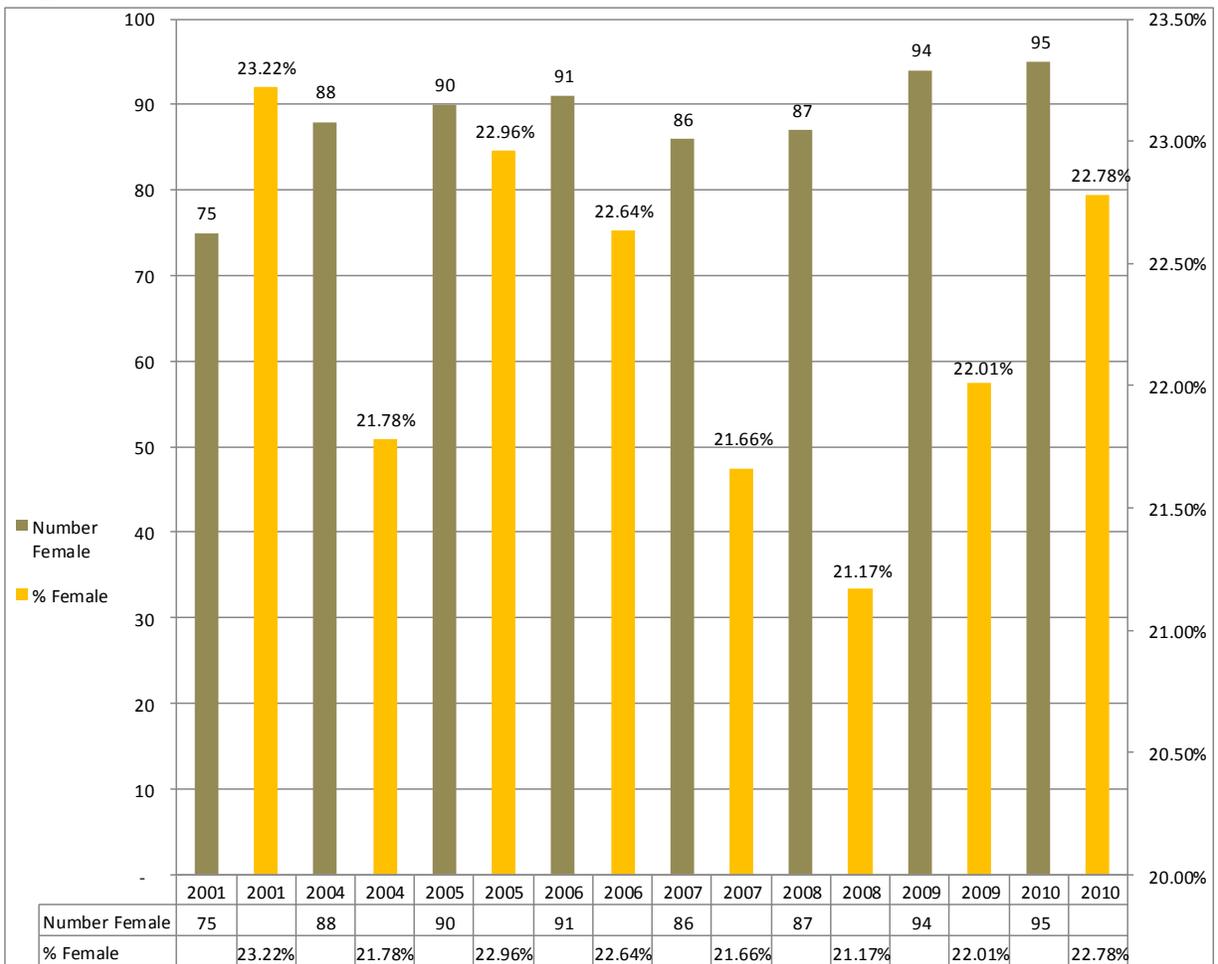
**4.1 Distribution of Science and Engineering Faculty:** In 2008, 29.82% of all T TT faculty at RIT were women while non T TT faculty had a higher representation at 40.67%. From 2001 – 2010 as shown in Figure 3, the percentage of female STEM T TT faculty has stayed relatively flat, with the numbers of female faculty members slowly increasing over most subsequent years. At 22.78% female STEM T TT faculty in 2010, RIT is significantly lower than the 34% average of doctoral scientists and engineers employed at Master’s granting colleges and universities in the U.S. [1]. There is also variability in the representation of women faculty members between STEM departments with 11.76% (4/34) of academic STEM units in 2010 including no female T TT faculty and 50.0% (17/34) including a representation below 20% which is often referred to as a critical mass threshold [28,29].

**4.2 Recruitment of STEM T TT Faculty:** For the period 2007-2010, the percentage of female STEM TT hires was 22.08% (Figure 4). We have seen a general upward trend over the past several years from a low in 2005 of 8.33% (ratio of female to total hires or 1/12) to a high in 2010 of 55.56% (5/9). As shown in Figure 4, the percentage of female applicants for STEM TT positions was 18.70% which is significantly below the national pool of doctorates awarded to women in respective STEM fields as listed in Table 2 [1].

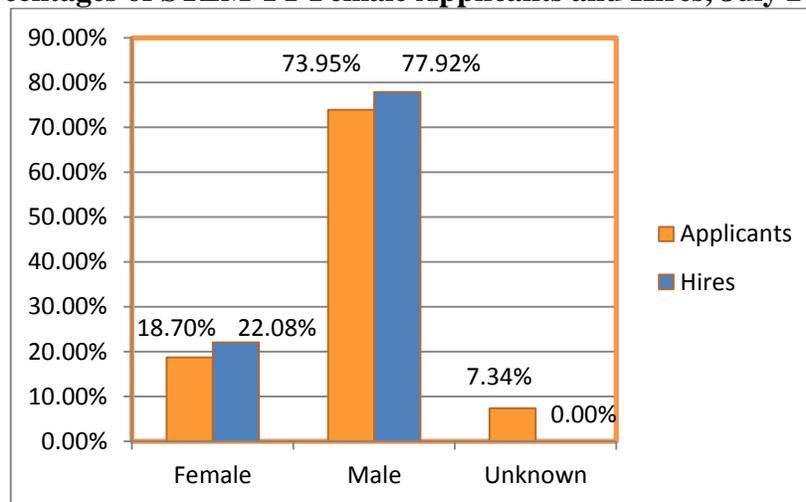
**4.3 Advancement of STEM T TT Faculty:** From 2006 - 2010, females made up 25.62% (31/120) of the T TT rank promotions and 20.93% (18/86) of the tenure approvals for STEM departments. There was no significant difference in the tenure denial rate for that same period for women and men faculty, with 6.25% for females (1 denied out of 16) and 9.8% for males (5 denied out of 51).

Female and male faculty within the most heavily populated STEM colleges at RIT tend to spend equivalent time in rank as an assistant professor before being promoted to associate professor with 5.59 years on average for females and 5.69 years for males according to 2006-2010 data (Table 6).

**Figure 3. STEM T TT Assistant, Associate, and Full Female Number and %, 2001-2010**



**Figure 4. Percentages of STEM TT Female Applicants and Hires, July 2007 – Sep. 2010**



**Table 6. Average Time in Rank (TIR) of Assistant Professor for Faculty Promoted to Associate Professors within the Largest STEM Colleges at RIT (2006-2010)**

<b>STEM College</b>	<b>Female Avg. TIR (faculty count)</b>	<b>Male Avg. TIR (faculty count)</b>	<b>College Avg. TIR (faculty count)</b>
College of Applied Science and Technology <sup>1</sup>	- (0)	4.60 (11)	4.60 (11)
College of Science	5.51 (6)	5.76 (12)	5.67 (18)
Golisano College of Computing & Info Sciences	5.60 (11)	6.48 (19)	6.15 (30)
Kate Gleason College of Engineering	6.00 (1)	5.39 (11)	5.44 (12)
<b>Average across included colleges</b>	<b>5.59</b> (18)	<b>5.72</b> (53)	<b>5.69</b> (71)

<sup>1</sup> Data listed is for faculty from CAST STEM departments only.

However, tenure track acceleration or tenure credit upon hire was less prevalent among female STEM T TT Assistant Professor hires as compared with their male cohort. Based on an arduous task of reviewing 63 faculty start-up letters from 2005-2008, of the 46 Assistant Professors hired (37 men and 9 women), 16% (or 6/37) of males received some credit toward tenure while 0% (0/9) of females received credit.

Regarding time in rank analysis for STEM T TT Associate Professors, Tables 7a and 7b are created based on October 2010 time in rank data for Associate Professors hired at assistant or associate ranks on or after 7/1/1999, respectively. Data is unavailable prior to this date due to a record system conversion issue. The representation of women among this faculty rank is 21.31% (26/122), closely matching the overall representation of women in the STEM T TT faculty. In comparing Tables 7a and 7b, most (80% or 8/10) female Associate Professors were hired at the Assistant Professor rank. From 2004-2009, only 10% (or 2/20) of female faculty hired were given the rank of Associate or Full at the time of hire as compared with 24.39% (or 20/82) of male new hires. In the future, the data represented here will inform time in rank comparisons between female and male Associate Professors, however due to the limited data available no conclusions can be drawn at this time.

**4.4 Attrition of Faculty by Gender and Ethnicity:** Studying faculty attrition at RIT reveals higher levels of leaving for women as compared with men. Tables 8a and 8b includes results from analyses for T TT faculty (at all ranks) hired in each calendar year from 2002-2011. The tables list how many are still employed at RIT as of October 1, 2011 and how many faculty have left each year voluntarily. Deceased faculty are not included in either hire or attrition data and faculty who left for retirement are not included in the data. . Table 8a includes attrition data by gender and Table 8b includes attrition data by race. From 2002 - 2011, of the 107 female faculty hired, 26.17% (or 28/107) left as compared with 16.00% (32/200) of male faculty as shown on Table 8a, which constitutes a statistically significant difference (p<0.05). The attrition rate for AALANA (African American, Latina American, and Native American) faculty hired over the

same period was 24.53% (13/53) which is considerably higher than that for non-AALANA faculty of 18.78% (46/245) as listed on Table 8b.

The assistant professor (T TT) turnover rate at RIT from 2002 - 2009 was 29% for females and 13% for males. Turnover rate is based on the number of assistant professors leaving RIT (voluntary and involuntary) divided by the number of assistant professors hired over a given time period. The turnover rates display high variability depending on college with five colleges (STEM and non-STEM) revealing higher attrition rates for women faculty than men and three colleges (all STEM) where no women faculty left over this time period.

**Table 7a. Time in Rank of STEM T TT Associate Professor among those Hired (on or after 7/1/99) as Assistant Professor (October 2010)**

<b>Time (years) in Rank</b>	<b>Female Count (% of women)</b>	<b>Male Count (% of men)</b>	<b>Total Count (% of total)</b>
0 to less than 3 years	7	25	32
	(87.50%)	(83.33%)	(84.21%)
3 to less than 6 years	1	5	6
	(12.50%)	(16.67%)	(15.79%)
6 to less than 9 years	0	0	0
9 to less than 12 years	0	0	0
15 years and longer in rank	0	0	0
<b>Total</b>	<b>8 (100%)</b>	<b>30 (100%)</b>	<b>38 (100%)</b>

**Table 7b. Time in Rank of STEM T TT Associate Professor among those Hired (on or after 7/1/99) as Associate Professor (October 2010)**

<b>Time (years) in Rank</b>	<b>Female Count (% of women)</b>	<b>Male Count (% of men)</b>	<b>Total Count (% of total)</b>
0 to less than 3 years	1	12	13
	(50.00%)	(57.14%)	(56.52%)
3 to less than 6 years	1	5	6
	(50.00%)	(23.81%)	(26.09%)
6 to less than 9 years	0	4	4
	(0%)	(19.05%)	(17.39%)
9 to less than 12 years	0	0	0
15 years and longer in rank	0	0	0
<b>Total</b>	<b>2 (100%)</b>	<b>21 (100%)</b>	<b>23 (100%)</b>

**Table 8a. Voluntary Attrition Data by Gender for T TT Faculty (at all ranks) Hired in each Calendar Year from 2002-2011 with Number Still Employed at RIT as of October 1, 2011 (voluntary attrition only)**

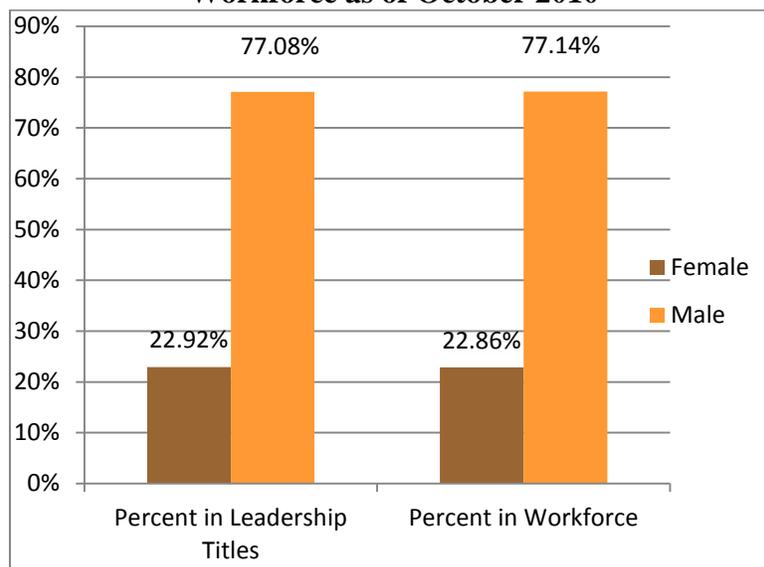
Calendar Year Hired	Female			Male		
	Female Hires	Female Voluntarily Left	Female Voluntary Attrition Rate	Male Hires	Male Voluntarily Left	Male Voluntary Attrition Rate
2002	13	6	46.15%	26	9	34.62%
2003	19	8	42.11%	22	5	22.73%
2004	6	1	16.67%	23	3	13.04%
2005	3	1	33.33%	16	5	31.25%
2006	15	6	40.00%	12	1	8.33%
2007	7	4	57.14%	21	4	19.05%
2008	7	1	14.29%	30	2	6.67%
2009	16	1	6.25%	22	1	4.55%
2010	11	0	0.00%	14	2	14.29%
2011	10	0	0.00%	14	0	0.00%
<b>Total 02-11</b>	107	28	<b>26.17%</b>	200	32	<b>16.00%</b>

**Table 8b. Voluntary Attrition Data by Race for T TT Faculty (at all ranks) Hired in each Calendar Year from 2002-2011 with Number Still Employed at RIT as of October 1, 2011 (voluntary attrition only and undisclosed race are not included)**

Calendar Year Hired	AALANA			Non-AALANA		
	AALANA Hires	AALANA Voluntarily Left	AALANA Voluntary Attrition Rate	Non-AALANA Hires	Non-AALANA Voluntarily Left	Non-AALANA Voluntary Attrition Rate
2002	8	6	75.00%	31	9	29.03%
2003	10	2	20.00%	31	11	35.48%
2004	5	2	40.00%	24	2	8.33%
2005	3	2	66.67%	16	4	25.00%
2006	7	1	14.29%	20	6	30.00%
2007	3	0	0.00%	25	8	32.00%
2008	6	0	0.00%	26	2	7.69%
2009	7	0	0.00%	27	2	7.41%
2010	2	0	0.00%	23	2	8.70%
2011	2	0	0.00%	22	0	0.00%
<b>Total 02-11</b>	53	13	<b>24.53%</b>	245	46	<b>18.78%</b>

**4.5 Gender Distribution of Faculty in Leadership Positions:** Of the 709 leadership committee positions identified in our study, 33.43% (237) are held by females. This closely matches the percentage of all female faculty at RIT which is 33.2% (2010, STEM and Non-STEM, T TT and non T TT). In 2010, 22.92% (11/48) of the STEM leadership titles were held by women faculty which aligns with their representation within this population (Figure 5). However, women T-TT faculty hold 24.74% of leadership titles at RIT which is less than their overall representation.

**Figure 5. Percent of T TT STEM Faculty Holding Leadership Titles and Percent in Workforce as of October 2010**



**4.6 Resource Allocation for STEM Faculty by Gender:** An initial study of salaries of men and women faculty was conducted by RIT Human Resources based on salary averages by rank and gender. Upon comparison for each rank across genders, unexplained differences were observed (Figure 6a). RIT Institutional Research and Policy Studies created a more detailed model with additional controls such as department, degree earned, years in rank, terminal degree, and ethnicity. A series of linear regression models were developed, using male faculty data, and then fitted to all faculty. Chi Square comparisons were run to see if female faculty tended to have more actual salary values below the predicted salary than male faculty. Comparisons were generated for the entire population, by rank, by college, and by rank within each college. For each college and/or rank, there were individuals for whom actual salary differed from predicted salary by more than what would be expected due to normal variation, based on the variables used in the models. A separate compression salary analysis was also conducted at this time.

Results were disseminated to the Provost and Deans to begin reviewing any potential areas of inequity. Where identified, initial faculty salary adjustments occurred in the fall of 2010 with RIT allocating 0.5% pool of salary dollars to begin correcting compression and gender related salary issues. Figures 6a and 6b report average salary (normalized to 9.5 months/year) by rank and gender for T TT STEM faculty before (Figure 6a) and after (Figure 6b) the salary adjustments were made in fall 2010. As a result of salary adjustments, the gender average salary gap was reduced for assistant female professors from 4.86% to 4.14% and for female associate professors from 5.99% to 3.17%. In the case of full professors, the gap actually widened from 5.97% to 7.79%.

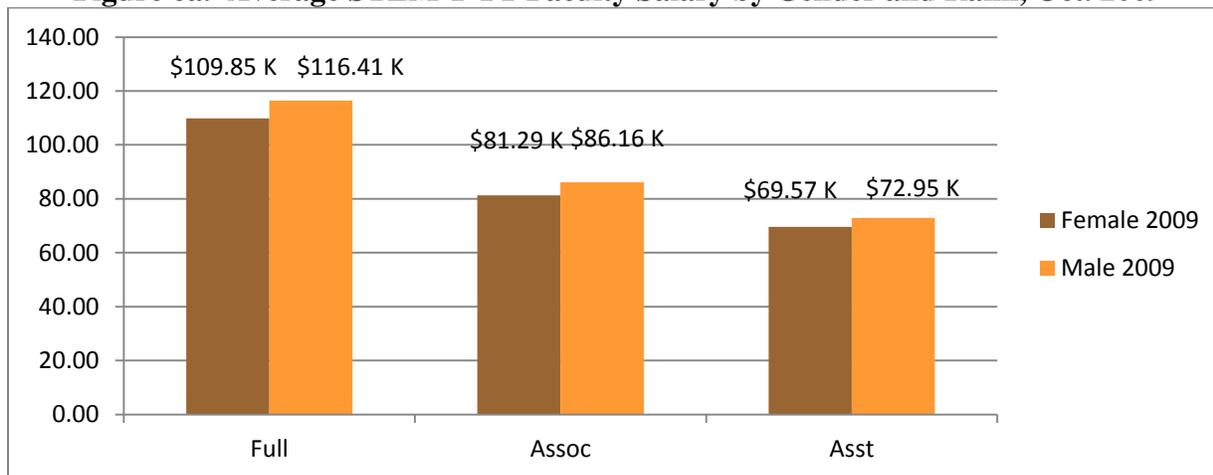
In addition, a study of space allocation and start-up packages of newly hired faculty by gender was attempted; however, data were too difficult to assemble given the current systems.

**4.7 Results from “RIT Faculty Career Life Survey”:** Climate survey statistical results can be downloaded at <http://nsfadvance.rit.edu/> or see **Appendix C**. Detailed results are based on: All

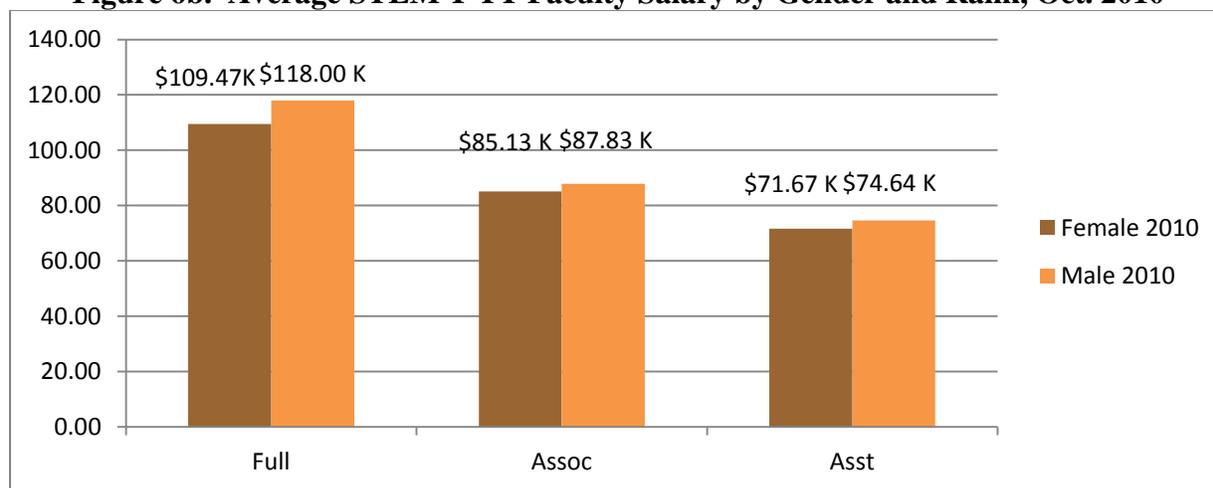
Responses by Gender, Non-STEM and STEM Responses by Gender, All Responses by Ethnicity, and All Responses by Rank.

The 2009 climate survey included questions regarding the level of overall satisfaction with current position and serious consideration of leaving RIT. Response patterns for several questions are explored [30, 31].

**Figure 6a. Average STEM T TT Faculty Salary by Gender and Rank, Oct. 2009**



**Figure 6b. Average STEM T TT Faculty Salary by Gender and Rank, Oct. 2010**



The survey results indicate differences in overall satisfaction with position (survey question 19k: *All things considered, how satisfied are you with your current position at RIT?*) by several demographic variables including gender, faculty rank, and STEM/non-STEM. In an ordinal logistic regression model of these variables on overall satisfaction, the following results were noted:

- All three demographic variables, namely gender, faculty rank, and STEM/non-STEM were significant.
- Higher satisfaction is more likely for males than for females ( $p < 0.05$ ).
- Higher satisfaction is more likely for Professors than for Assistant Professors ( $p < 0.01$ ).

- No difference between Associates and Assistant Professors.
- Higher satisfaction is less likely for STEM faculty than for non-STEM ( $p < 0.01$ ).

Overall, differences in average satisfaction align with the results of the regression for example:

- Average Satisfaction by Rank: Assistant - 3.49, Associate - 3.49, Full - 3.90
- Average Satisfaction by STEM/non-STEM: non-STEM - 3.75, STEM - 3.53
- Average Satisfaction by Gender: Female - 3.49, Male - 3.69

Examination of responses to overall satisfaction by gender indicates the following:

- On average, males have higher satisfaction than females ( $p < 0.05$ )
- 57.1% of females and 63.8% of males were satisfied (not significantly different).
- 20.6% of females and 15.6% of males were dissatisfied (not significantly different).
- 16.0% of females and 24.0% of males were very satisfied ( $p < 0.05$ )

Looking at the data further, it seems that gender differences in average satisfaction grow with rank (faster for non-STEM than for STEM).

- Assistant and non-STEM: Female - 3.50, Male - 3.54 ( $F - M = -0.04$ )
- Assistant and STEM: Female - 3.44, Male - 3.47 ( $F - M = -0.04$ )
- Associate and non-STEM: Female - 3.52, Male - 3.69 ( $F - M = -0.17$ )
- Associate and STEM: Female - 3.26, Male - 3.41 ( $F - M = -0.15$ )
- Full and non-STEM: Female - 3.75, Male - 4.29 ( $F - M = -0.54$ )
- Full and STEM: Female - 3.47, Male - 3.80 ( $F - M = -0.33$ )

Female/male comparisons within rank and STEM do not show significance (except for non-STEM Full Professor), which could be due to the smaller sample sizes for the comparisons.

There were no significant differences in survey responses to the question regarding serious consideration of leaving RIT by demographic variables (survey question 36b: *I have seriously considered leaving RIT in order to achieve better balance between work and personal life.*) Overall, 25% of faculty agree or strongly agree with this question.

To explain overall satisfaction with current position and serious consideration of leaving RIT in terms of the climate survey questions, measures of *value and influence*, *department climate*, and *work/life stress* were considered. Figure 7 summarizes these results, with plus signs on the arrows indicating positive relationships and minus signs indicating negative relationships.

The following seven variables were considered measures of *value and influence* (with an alpha reliability coefficient of 0.75).

- Sense of being valued by unit/department and upper administration.
- Level of social interaction with colleagues, solicitation of opinions about scholarship.
- Satisfaction that one's research is on track for career advancement and with one's long range career plan.
- Amount of influence in the unit/department over obtaining a desired teaching schedule.

A linear regression analysis of overall satisfaction on this set of variables termed *value and influence* had an adjusted-R<sup>2</sup> value of 60.3% (separately by gender, this is 58.2% for females and 61.4% for males). Regressing serious consideration of leaving RIT on these variables had an adjusted-R<sup>2</sup> value of 12.1% (16.2% for females and 10.2% for males).

*Department climate* was measured with a set of eight variables, including sociability, diversity, respect, collegiality, gender equality, collaboration, cooperation, and support (with an alpha reliability coefficient of 0.90). The linear regression of overall satisfaction on these *department climate* variables had an adjusted-R<sup>2</sup> value of 20.8% (separately by gender, this is 19.2% for females and 21.3% for males). Regressing serious consideration of leaving RIT on these variables had an adjusted-R<sup>2</sup> value of 9.2% (11.9% for females and 8.6% for males).

*Work/life stress* was measured by satisfaction with the work/life balance and six sources of stress, including managing household responsibilities, child care issues, personal health, health of family members, personal finances, and planning for retirement (with an alpha reliability coefficient of 0.77).

- The linear regression of overall satisfaction on these *work/life stress* variables had an adjusted-R<sup>2</sup> value of 13.1% (and 17.2% for males), while regressing serious consideration of leaving RIT on these variables had an adjusted-R<sup>2</sup> value of 9.2% (16.4% for males).
- This set of variables was not reliable for females (alpha = 0.60 for women), so was reduced to only satisfaction with the work/life balance and stresses due to managing household responsibilities and child care issues (alpha = 0.77 for females). The linear regression of overall satisfaction on this subset of work/life stress variables had an adjusted-R<sup>2</sup> value of 7.3% for females, and the regression of serious consideration of leaving RIT had an adjusted-R<sup>2</sup> value of 15.5% for females.

It appears that, for males, household responsibilities and child care are just as reliable as health and finance concerns in measuring stress. Female stress seems to be focused on household responsibilities and child care, while male sources of stress also include health and finance concerns. However, the largest correlation with overall satisfaction and serious consideration of leaving is satisfaction with the work/life balance (this is true for both males and females).

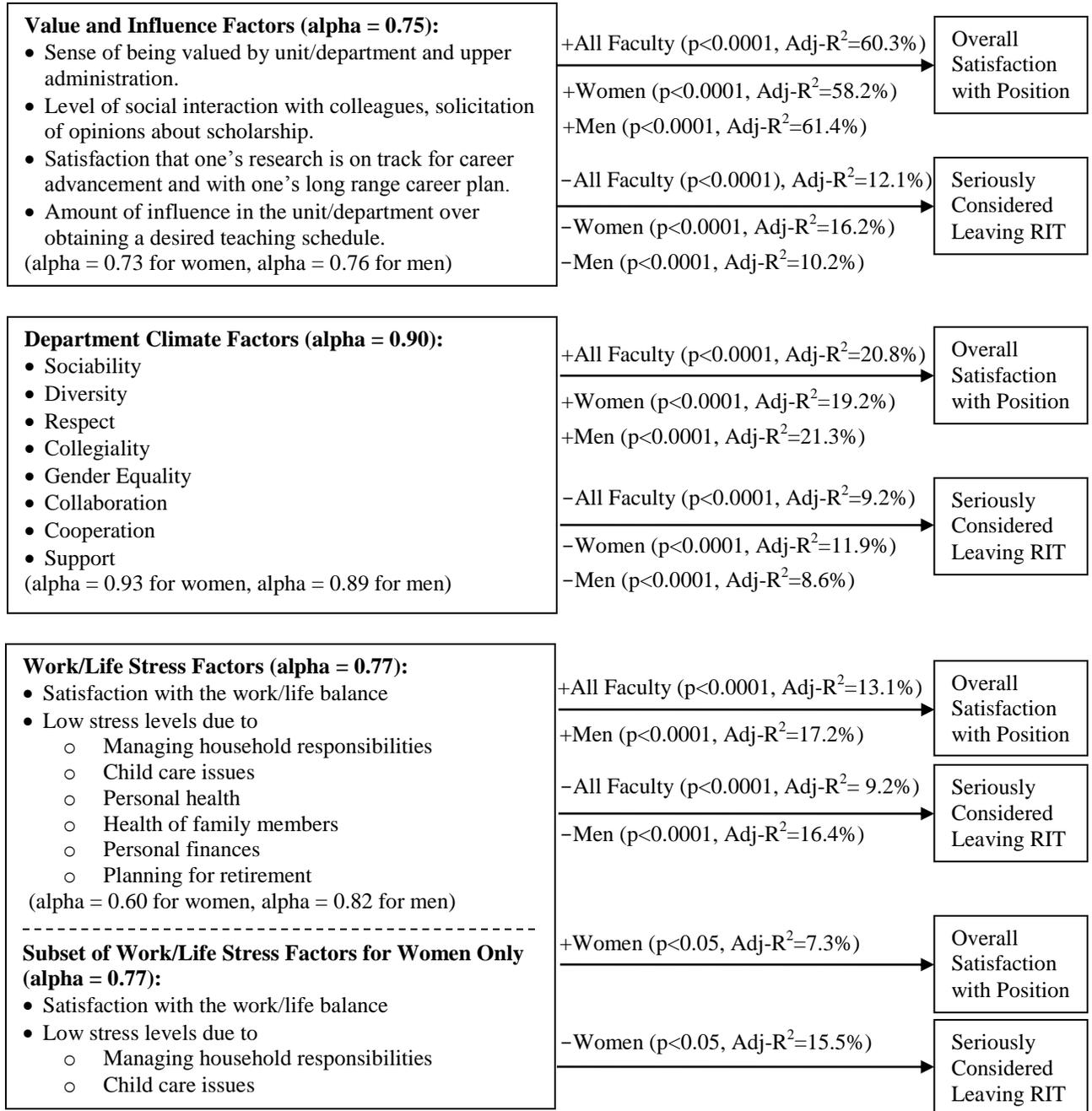
Therefore, in explaining overall satisfaction with current faculty position at RIT in terms of the climate survey questions, the measure of *value and influence* is the most useful with an adjusted-R<sup>2</sup> value of 60.3%. This measure is equally valid for men and women. Serious consideration of leaving RIT is not as well explained by any of the three measures (value and influence, climate, and work/life stress).

The three sets of questions regarding value and influence, department climate, and work/life stress are further analyzed, with results by ethnicity and gender, by college, and by department in a supplemental report titled NSF EFFORT@RIT Measures by Gender, Ethnicity, and College. To download the supplemental report, visit <http://nsfadvance.rit.edu/>, or see **Appendix D** [31].

In benchmarking these results to other universities it is clear that RIT is unique in the factors that predict faculty satisfaction with one's position.

- University of Michigan found the following factors to contribute positively to job satisfaction for STEM faculty: Satisfaction with resources, rating of chair, and the degree to which people feel that they influence department climate (men and women); positive climate (women); committee service (men) and gender egalitarian atmosphere (men). Factors contributing negatively to job satisfaction: Scholarly isolation (men and women); department failing to nominate them for an award (women); overhearing disparaging comments about women (women); and overhearing disparaging comments about racial-ethnic minorities (men) [26].

**Figure 7. Regression Analyses for Satisfaction and Serious Consideration of Leaving**



- Harvard University found extent to which department is a good fit (tenured faculty) and adequate overall mentoring (tenure-track faculty) to be the most significant positive contributors to job satisfaction [25].
- Case Western Reserve University found that women seem to gain greater job satisfaction than men from a positive internal work environment while men seem to gain greater job satisfaction than women from internal academic resources [6].

## 5. Barriers to the Recruitment and Advancement of Women Faculty at RIT

The climate survey results, in conjunction with the objective data review and benchmarking information, lead us to believe that important barriers to the recruitment and advancement of women at RIT include career navigation, climate, and flexibility/options for managing the work/life balance [30].

**5.1 Career Navigation:** In negotiations, female survey responses indicate more effort while male responses indicate more satisfaction. The 2009 climate survey results are similar to those found during the 2002-03 focus groups.

- During initial contract negotiation, females indicate more effort ( $p < 0.01$ ) in pursuing credit towards tenure than males, while males indicate more satisfaction with rank and salary ( $p < 0.05$ ) and summer salary ( $p < 0.05$ ).
- Since initial contract negotiation, females indicate more effort ( $p < 0.01$ ) in pursuing course release than males, while males indicate more satisfaction with rank and salary ( $p < 0.05$ ) and summer salary ( $p < 0.05$ ).

Results from other schools were available in terms of items requested and offered, but without additional details and context, it is difficult to read more into the results. For example, information about gender differences in course release time requests or offers would be more meaningful with companion information regarding the starting course load. UC-Boulder survey results [32] indicate that more men than women faculty negotiated and were aware that they could negotiate, but a higher percentage of women received what they wanted in negotiations. University of Michigan (2001) survey results [26] indicate that, during initial contract negotiations, STEM women were more likely than STEM men ( $p < .05$ ) to be offered lab space. During contract renegotiations, STEM men were more likely than STEM women ( $p < .05$ ) to be offered course release time, lab equipment, and travel funding. The differences in faculty asking for items during renegotiation were not significant by gender.

The seemingly higher success of males in negotiations is supported by our objective data review:

- In the period from 2004 through 2009, 24% of males were hired above the assistant professor level compared to 10% of females.
- Based on manual review of faculty start-up letters from 2005-2008, 16% of males hired at the assistant professor level received some credit toward tenure, compared to 0% of females. With no central database, this data was difficult to assemble.

Whether by choice, luck or skillful negotiation, males spend their time differently than females, often better aligning themselves for career advancement.

- Faculty were asked to estimate how they apportioned time at work across several given domains of activity. The figures entered could differ from the formal terms of appointment. Percentages were selected which summed to 100%.
- Males report spending more time in scholarship/research (21% of time compared to 18.2% for females,  $p < 0.05$ ) and service to their discipline (6.7% of time compared to 5.3% for females,  $p < 0.05$ ), and less in teaching than the females (46.2% of time compared to 50.8% for women,  $p < 0.01$ ).
- A higher percentage of males (60.5%) than females (51.6%) have been asked to serve in a leadership role at RIT ( $p < 0.05$ ).
- Males are more satisfied on average with their distribution of time, scholarship/research, long range career plans, and position overall ( $p < 0.001$ ,  $p < 0.05$ ,  $p < 0.05$ , and  $p < 0.05$ ) than the females.
- Regarding distribution of apportioned time, 39.3% of male respondents were satisfied compared to 26.2% of females ( $p < 0.01$ ) while 50.0% of female respondents were dissatisfied as compared to 31.9% of males ( $p < 0.001$ ).
- In regards to satisfaction with overall scholarship/research dimension of professional career,
  - 11.6% of women respondents were very dissatisfied compared to 4.8% of men ( $p < 0.05$ )
  - 33.5% of women respondents were dissatisfied as were 26.8% of men (not statistically significant)
  - 48.4% of male respondents were satisfied as were 40.5% of female (not statistically significant).
- Regarding quality of long range career map/plan:
  - 6.5% of women respondents were very dissatisfied compared to 2.1% of men ( $p < 0.05$ ).
  - 20.0% of women respondents were dissatisfied as were 14.5% of men (not statistically different).
  - 58.2% of male respondents were satisfied as were 54.1% of female (not statistically different).

With regard to tenure,

- 84% of female respondents and 90% of male respondents feel that neither sex gets preferential treatment during the tenure process (16% of females feel that males get preferential treatment, while 8% of males feel that females get preferential treatment). On the 2002-03 climate survey, 65% of female respondents compared with 54% of all respondents did not agree that the tenure process was fair for all.

A larger percentage of women are more proactively seeking advice from mentors as compared to their male peers and therefore demonstrating self-agency.

- 30% of female faculty report having a mentor, compared to 18% of male faculty ( $p < 0.01$ ).
- Among survey responses, 60% of females and 35% of males do ( $p < 0.0001$ ) view support for mentoring junior faculty to be of significant value in improving the overall quality of faculty work/life balance at RIT.

The issue of mentoring has arisen at other schools, where mentoring is often either not present uniformly or not effective. At UC-Boulder [32], survey results indicate that more women than men have mentors. However, more men than women have mentors who are of the same gender and in the same department. At Rice [33] there was no significant gender difference in mentoring. Mentors were reported as equally likely to be internal to Rice and external. In general, the quality of mentoring was scored poorly. At Harvard University [25] women view their departments' mentoring of junior faculty less effective and adequate than men, although both men and women on average rate the effectiveness and adequacy as being on the positive side of neutral. 90% of tenured faculty report having served as a mentor (formal, informal, or both), with no significant gender differences. Nearly 90% of tenure-track faculty report having a mentor (formal, informal, or both), and informal mentoring is reported to be significantly more helpful. Women view mentoring as significantly less adequate than men do in the following areas: publishing scholarly work, teaching, requirements for promotion and tenure, negotiating office politics, and work-life balance. At the University of Michigan [26] a survey asked about mentoring in eight specific areas: providing a role model, acting as an advocate, networking, preparation for advancement, publishing, departmental politics, obtaining needed resources, and balancing work and family. All respondents indicated either "some" mentoring or "none" in each of these areas. STEM women assistant professors reported having significantly fewer mentors than STEM men assistant professors, and STEM women reported an average of over three areas with no mentoring, compared with less than one area with no mentoring on average for STEM men.

The objective data review and salary study revealed differences along gender lines:

- 32% of female T TT STEM faculty do not have a terminal degree (compared to 22% of the male faculty), thus limiting their chances for advancement.
- For each college and/or rank, there were individuals for whom actual salary differed from predicted salary by more than what would be expected due to normal variation, based on the variables used in the models. The deans and Provost reviewed the individual data to determine what, if any, action needed to be taken. For reporting purposes, average salary by rank and gender for T TT STEM faculty are presented for 2009 and 2010 which coincide with the periods before and after the salary study and adjustment process (Figures 6a, 6b).

We hypothesize that women's self-agency and negotiation skills, coupled with a lack of "sponsorship" from more seasoned faculty and/or administration, hinder the success of female faculty in obtaining more advantageous starting packages, assignments, compensation, and work plans [8,13-15].

**5.2 Climate:** Male responses indicate a more positive department view than female responses.

- Males' view of their department on a whole is more friendly ( $p < 0.05$ ), diverse ( $p < 0.01$ ), respectful ( $p < 0.01$ ), and non-sexist ( $p < 0.0001$ ) than females' view of their department.
  - By looking at the distributions of responses, we can see that 66% of females view the department as friendly, compared to 74% of males.
  - 49% of females and 62% of males consider their department to be diverse.
  - 61% of females and 65% of males view their department as respectful.

- The department is viewed as non-sexist by 62% of females and 81% of males. Conversely, 18% of female respondents and 6% of male respondents feel the campus tends toward being sexist which is an improvement from the 2002-03 climate survey of 34% of female and 15-20% of male respondents.
- Males agree more strongly than females that they are free to pursue their research without risk to their tenure ( $p < 0.01$ ).
  - In the distributions of responses, 58% of females and 70% of males agree that they are free to pursue their research without risk to their tenure (of which 28% of females and 41% of males strongly agree).
- A higher percentage of females (15%) than males (2.5%) indicate receiving unwanted sexual attention ( $p < 0.0001$ ).
- A higher percentage of females than males feel that the other sex within their department gets preferential treatment as described in Table 9.

**Table 9. Preferential Treatment Survey Response Breakdown by Gender**

Area	% Females Who Feel That Men Get Preferential Treatment	% Males Who Feel That Women Get Preferential Treatment
Promotion	22%	9%
Tenure	16%	8%
Receiving Career Advice	27%	15%
Career Advancement/Leadership	41%	12%
Compensation	62%	9%

Other schools reported similar results in terms of department climate and the presence of unwanted sexual attention. At the University of Michigan STEM men view their department as having a more positive, tolerant, gender egalitarian climate, feel less surveillance and tokenism, and view their department chair as more fair and creating a more positive environment, compared with STEM women ( $p < .05$ ). Michigan's survey also revealed a higher percentage of STEM women reporting sexual harassment and reporting that *others* reported sexual harassment than STEM men ( $p < .05$ ). This survey did not ask a perception question related to men or women receiving preferential treatment, but it did include a question about experiencing gender discrimination. In the areas of promotion, salary, space, equipment, resources, and access to administrative staff, STEM women more frequently reported gender discrimination than STEM men ( $p < .05$ ). Additionally, the results of the Michigan survey indicate that positive climate is a substantial predictor of overall satisfaction [26].

At UC Boulder the results of the department climate questions were grouped together in order to assign a single score. Tenure track women scored significantly ( $p < .05$ ) lower than tenure track men on this score, meaning that their perceptions of their department or unit climate were overall more negative than the perceptions of men [32]. At Rice women rated their department climate as less friendly and tolerant than men, although both men and women's average scores were on the positive side of a neutral assessment. Men also reported a higher level of gender egalitarianism. Women reported higher levels of isolation, tokenism, and surveillance than men. More women than men reported receiving unwanted sexual attention during the past 5 years [33].

In addition, the objective data review reveals while the representation of female faculty at RIT has slowly increased over the past fifteen years, levels lag behind national benchmarks. The women on the faculty are also more likely to leave RIT than male faculty.

- Since 1995 the number of women T TT STEM faculty has nearly tripled although the representation has increased slowly from 15.9% in 1995 to 22.8% in 2010.
- The representation of women T TT STEM faculty has remained relatively unchanged since 2001, ranging from 23.2% in 2001 to 22.78% in 2010 which are significantly lower than the 34% average of doctoral scientists and engineers employed at Master's granting colleges and universities in the U.S [1].
- There is also variability in the representation of women faculty members between STEM departments with 11.76% (4/38) of academic STEM units in 2010 including no female T TT faculty, 14.71% (5/34) with only one, and 50.0% (17/34) including a representation below 20% which is often referred to as a critical mass threshold [28,29].
- The assistant professor turnover rate from 2002 - 2009 was 29% for females and 13% for males. Turnover rate is based on the number of assistant professors leaving RIT (voluntary and involuntary) divided by the number of assistant professors hired over a given time period. The turnover rate is highly dependent on college with five colleges (STEM and non-STEM) revealing higher attrition rates for women and three colleges (all STEM) where no women faculty left.
- Overall T TT faculty attrition at RIT reveals higher levels of leaving for women faculty as compared with men based on hire data from 2002-2011. When determining how many are still employed at RIT as of October 1, 2011 (all voluntary termination reasons considered except retirement), of the 107 female faculty hired, 26.17% (or 28/107) left as compared with 16.00% (32/200) of male faculty.

The literature shows that women's view of the workplace in personal terms, as opposed to a more male process-oriented view, means that issues of connectedness, support, and interpersonal relations, are important to their success [5-8].

**5.3 Managing Work/Life Balance:** Female responses indicate more stress, less satisfaction, and higher value in flexibility/options than male responses. The 2009 climate survey results are similar to those found during the 2002-03 focus groups.

- 58% of female respondents and 64% of male respondents think their colleagues are supportive of their work/life balance.
- Managing household responsibilities ( $p < 0.0001$ ), child care issues ( $p < 0.0001$ ), and health of family members ( $p < 0.01$ ) were more stressful for females, on average, than for males.
  - Among the responses, 36% of females and 16% of males indicated that managing household responsibilities is a source of significant stress.
  - Child care issues are a source of significant stress for 34% of females and 14% of males.
  - Health of family members is a source of significant stress for 25% of females and 16% of males.
- On average, males agree more strongly that they are satisfied with their work/life balance ( $p < 0.05$ ).

- Among the responses, 43% of females and 48% of males agree that they are satisfied with their work/life balance (of which 13% of females and 19% of males strongly agree).
- 39% of females and 29% of males disagree that they are satisfied (of which 10% of females and 8% of males strongly disagree).
- Females agree more strongly, on average, that they often forego personal activities for professional responsibilities ( $p < 0.05$ ) and that their career has been slowed by personal responsibilities ( $p < 0.0001$ ).
  - Among the responses, 66% of females agreed that they often forego personal activities for professional responsibilities, compared to 47% of males.
  - 38% of female respondents and 26% of male respondents report that they forego professional activities for personal responsibilities.
  - 50% of females and 23% of males agreed that their career has been slowed by personal responsibilities.
- A higher percentage of females (34.6%) than males (16.2%) have considered time off for personal reasons ( $p < 0.0001$ ).
- On average, females view assistance with employment for a spouse and increased clerical/administrative support to be of more value than males do (all  $p$ 's  $< 0.001$ ).
  - Among the responses, 43% of females and 22% of males view assistance with employment for a spouse to be of significant value.
  - 49% of females and 30% of males consider increased clerical/administrative support to be of significant value.
- On average, females view all of the following to be of more value than males do (all  $p$ 's  $< 0.0001$ ). Listed next to each policy or practice is the percentage among the responses who consider this to be of significant value.
  - More on site/near site child care: 40% of females and 17% of males
  - Child care with extended hours: 42% of females and 12% of males
  - Subsidies/grants for child care: 45% of females and 15% of males
  - Part time faculty appointments: 29% of females and 10% of males
  - Enhanced tenure clock policies: 42% of females and 14% of males
  - Options for alternative work arrangements: 52% of females and 14% of males
  - Support for mentoring junior faculty: 60% of females and 35% of males
  - Award for outstanding female faculty: 34% of females and 11% of males

Work-life balance issues were identified at other ADVANCE schools. The Harvard University survey results [25] indicate that the following areas are reported as a higher level of stress more frequently for women than men: managing household responsibilities, child care, dependent care, your own health, and reproductive decisions/issues. The Rice survey [33] did not show any significant gender differences in satisfaction with the balance between work and personal life, although the results did indicate that assistant professors were the least satisfied and full professors the most satisfied with this balance. The University of Michigan survey [26] indicated that STEM women were significantly less likely than STEM men to be satisfied with their work/life balance. The University of Wisconsin-Madison survey [34] indicated that men were more likely than women to agree that they are satisfied with their work/life balance. More women than men felt that their career progression has been slowed by personal responsibilities. No significant gender differences were found regarding foregoing *professional* activities for

*personal* responsibilities (the Wisconsin survey asked this question in a different way than the RIT survey).

The objective data review showed that, although RIT has part-time faculty positions, few, if any, T TT STEM faculty have such a position.

- In 2009, 10 of the 545 STEM faculty were part-time, 9 of whom were non-T TT. In 2010, all of the STEM part-time faculty were non-T TT.

It is unclear if faculty are unaware that this option exists or are not taking advantage of it due to the ambiguity of its effect on tenure, promotion, status with the department, and eligibility for retirement. Among survey responses, 29% of females and 10% of males view part-time faculty appointments and 52% of females and 14% of males view alternative work arrangements to be of significant value in improving the overall quality of faculty work/life balance at RIT.

Dual career employment issues are also relevant for many faculty at RIT and both genders report agreement with the need for more assistance with employment for spouse/partner, women report higher levels of agreement ( $p < .001$ ). Faculty identifying this issue as a source of stress on the climate survey expressed concerns regarding the disruption that spousal/partner separation can cause on the family unit and the likelihood that RIT loses potential hires due to the lack of clear dual career practices.

In order to address this issue, RIT is a member university within a regional consortium in Upstate New York called HERC (available at [http://www.unyherc.org/home/index.cfm?site\\_id=671](http://www.unyherc.org/home/index.cfm?site_id=671)) which provides a means of sharing information among members in order to attract outstanding faculty. One of the featured areas of HERC focuses on the dual career candidate. As was the case with part-time employment options, it is unclear if faculty are aware of this network or if they are not taking advantage of it due to ambiguity or lack of usefulness. Even among universities with clear policies regarding dual-career placement assistance, only a minority post the information in a manner that is easily found [35].

Benchmarking with other institutions shows RIT lacks the following:

- Articulated methods to stop/extend the tenure clock
- Clear definition of maternity leave beyond a definition of the Family Medical Leave Act
- Institute-level formal mentoring program or framework for faculty

Policy benchmarking revealed that only three schools in our comparison cohort and including RIT did not have clearly articulated methods of “stopping the tenure clock” or extending time toward tenure. This policy was one that is often questioned and discussed during the interview stage for potential female faculty. Without a clear definition available in the policy, a potential faculty member may consider the school unsupportive toward family/health issues.

Observed differences were also noted for a clear definition of faculty maternity leave, although this difference was not as evident. Five of the schools evaluated, including RIT, did not have a readily available explanation of how maternity was handled beyond a definition of the Family Medical Leave Act. Three of the four ADVANCE schools had very specific information related to this, for example RPI has “one semester at full pay and another semester at half pay.”

RIT and one other were the only schools that did not have a formal mentoring program in place, although four of the twelve schools that do have mentoring programs identified on their website somewhere did not have a well-defined process available to the public.

Perhaps due to the lack of family friendly policies including dual-career considerations and a clearly articulated mentoring program in place at RIT, objective data review revealed that RIT is unable to attract a sufficient representation of women within faculty candidate pools for open STEM T TT positions.

- For the period 2007 - 2010, the percentage of female applicants for STEM TT positions was 18.70% which is significantly below the national pool of doctorates awarded to women in respective STEM fields (Table 2) [1].

We conjecture that managing work/life balance through flexible work arrangements, available and convenient child care, and tenure clock adjustments, may lower stress and increase satisfaction, and potentially aid in the retention and recruitment of female (and male) faculty [9,20,24-26].

**5.4 Summary of Related Faculty Comments:** On the 2009 RIT Faculty Work Life Survey, there were several opportunities for faculty to express their opinions in written form on topical areas covered in the survey. Response rate were relatively high for these questions with 197 faculty commenting on “teaching activities, resource allocations, and service”; 169 commenting on “career satisfaction”; and 124 on “sources of stress”. A quantitative representation of common responses ( $n > 5$ ) to four of the open-ended questions on the survey is located in Table 10a through Table 10d. A summary of this data is also included at <http://nsfadvance.rit.edu/>.

## **6. Success of Existing Structures at Addressing Barriers to the Recruitment and Advancement of Women Faculty at RIT**

In response to a lack of adequate gender diversity at RIT, in 2007 when our current President began his tenure, several strategic goals were established to increase the representation of women students and T TT faculty on campus. Shortly afterwards, The President’s Commission on Women was established based on a previous advisory board created by the past-President. The first charge of this renamed group was to provide recommendations to increase the representation of women undergraduate students at RIT. The commission consists of faculty, staff, administrators, and student representatives and possesses only an advisory role with no formal reporting structure outside of the President. In response to aggressive goals around women students, the RIT Office of Admissions created a more aggressive recruitment strategy for women.

**Table 10a. Quantitative Summary Table for Question 15: *Additional comments regarding your teaching activities, resource allocation negotiations, or service.***

<i>q15: Additional comments regarding your teaching activities, resource allocation negotiations, or service.</i>							
(N=197)	Total	Female	Male	STEM Gender		Non-STEM Gender	
<i>Common response categories with n&gt;=5:</i>	Responses			Female	Male	Female	Male
Leadership opportunities <sup>1</sup>	48	19	29	3	18	16	11
Lack of resources – time, space, funding, travel costs, start-up packages	44	19	25	6	15	13	10
Committee and service loads too high	32	12	20	3	12	9	8
Devalued service	28	13	15	8	11	5	4
Research institution want-to-be	24	7	17	2	15	5	2
Release time	19	10	9	1	6	9	3
High teaching load	18	9	9	2	6	7	3
High work load	17	6	11	3	6	3	5
Negotiations difficult or non-existent	16	9	7	5	5	4	2
Lack of clarity for expectations	8	2	6	0	4	2	2
Teaching is undervalued	7	1	6	1	5	0	1
Salary concerns	7	1	6	0	4	1	2
Poor mentorship	6	4	2	3	2	1	0
Course development reqd w/no support	5	2	3	1	2	1	1
Other responses which did not fit into a category	68	27	41	8	25	19	16

<sup>1</sup> Responses which were categorized as "Leadership opportunities" varied greatly.

**Table 10b. Quantitative Summary Table for Question 22: *Additional comments regarding your career satisfaction.***

<i>q22: Additional comments regarding your career satisfaction.</i>							
(N=169)	Total	Female	Male	STEM Gender		Non-STEM Gender	
<i>Common response categories with n&gt;=5:</i>	Responses			Female	Male	Female	Male
Lack of time/resources for research	54	28	26	12	15	16	11
Disconnect between upper administration drive for research and department level teaching culture or reality	30	11	19	7	17	4	2
High teaching loads	19	8	11	2	6	6	5
Under valued faculty	18	8	10	3	7	5	3
High service loads	16	8	8	2	2	6	6
Poor leadership	15	7	8	2	5	5	3
Vague promotion/tenure guidance	9	4	5	1	3	3	2
Low pay	8	3	5	2	5	1	0
Low marketability outside of RIT	6	3	3	1	1	2	2
Non-PhD barriers	5	1	4	0	3	1	1
Retirement	5	2	3	2	3	0	0
Unsupportive of family needs	5	4	1	2	1	2	0
External work is most rewarding	5	3	2	0	2	3	0
Other responses which did not fit into a category	70	19	51	3	28	16	23

**Table 10c. Quantitative Summary Table for Question 34: *Additional comments on any unit, department, college or institute climate issues.***

<i>q34: Additional comments on any unit, department, college or institute climate issues.</i>							
(N=58)	Total	Female	Male	STEM Gender		Non-STEM Gender	
<i>Common response categories with n&gt;=5:</i>	Responses			Female	Male	Female	Male
Lack of women leaders	7	6	1	2	0	4	1
Anti-female attitudes	7	6	1	3	0	3	1
Lack of support from RIT	7	5	2	1	1	4	1
Jokes/harassment	6	4	2	2	1	2	1
Other responses which did not fit into a category	54	35	19	15	11	20	8

**Table 10d. Quantitative Summary Table for Question 43: *Please indicate the extent to which each of the following has been a source of stress for you during the last two years: Other stresses related to balancing personal and professional life.***

<i>q43: Please indicate the extent to which each of the following has been a source of stress for you during the last two</i>							
(N=124)	Total	Female	Male	STEM Gender		Non-STEM Gender	
<i>Common response categories with n&gt;=5:</i>	Responses			Female	Male	Female	Male
General work load, teaching load or course load concerns	18	11	7	5	4	6	3
Concerns around new emphasis on scholarship	11	5	6	2	6	3	0
Flexible or decreased work load for new parents	10	6	4	1	4	5	0
Too many awards to female/minority/ethnic faculty not enough general faculty awards	10	4	6	1	5	3	1
Expanded Margaret's House hours/child care during irregular hours	8	6	2	2	2	4	0
Spouse dual career issues	7	5	2	2	1	3	1
Flexible work arrangements [job share, work from home, part-time]	6	5	1	3	1	2	0
Not feeling valued	6	2	4	2	3	0	1
Mentoring of Junior Faculty/pre-tenure faculty	5	4	1	0	1	4	0
Lack of trust in management/feeling that administration does not care	5	0	5	0	5	0	0
Committee responsibilities	5	3	2	0	1	3	1
Other responses which did not fit into a category	88	30	58	10	34	20	24

For nearly ten years, the upper administration at RIT has embraced and resourced the need for diversity among students and faculty with a specific focus on the AALANA population. In 2002, the Office of Faculty Recruitment was created and has developed many programs since its inception including the nationally recognized Future Faculty Career Exploration Program designed to increase racial diversity among faculty hires [36]. Other programs have focused on hiring AALANA post-doctoral students and providing funding for current AALANA employees to obtain advanced degrees. Although the office's mission includes mention of "women professionals and faculty" as an intended target audience, none of the programs offered have targeted this population specifically. This may be attributed to resourcing issues. The Office of

Faculty Recruitment also oversees and regulates Faculty Search Committee practices across campus and in this role there are measures in place to address both racial and gender diversity considerations.

Examples of existing or newly proposed structures designed to address barriers to the recruitment and advancement of women faculty at RIT which are identified in this study as career navigation, climate, and work/life balance include the following with a discussion on “success” where possible:

- The RIT Faculty Mentoring Network was proposed (2010) and under consideration for funding (2011) with peer-networking elements launched on a pilot scale in 2011. There is a perceived need for such a program on campus according to the 2009 climate survey where both women and men respondents identified value in supporting mentoring of junior faculty as a means of improving overall quality of faculty work/life balance at RIT. Women report significantly higher value in mentoring than men. Because the mentoring program is in its infancy, its effectiveness cannot be assessed at this time.
- Institutional membership in HERC has been obtained to assist dual-career faculty members. Based on climate survey results, both women and men see value in more assistance being offered to assist in spouse/partner employment. Women report significantly higher value in dual-career assistance than men.
- Part-time employment for faculty at RIT is available but not well-articulated or subscribed. Based on climate survey results, women see more value in part-time faculty appointments (39% vs. 10%) and alternative work arrangements (52% versus 14%) as compared with men in regards to improving the overall quality of work/life balance at RIT.
- The RIT Center for Women and Gender (formerly the RIT Women’s Center) within the Division of Student Affairs has been in existence for many years with a mission of fostering an educational environment in which women can personally, academically and professionally become successful. The center’s main focus is on women students however programing is also offered for women staff and faculty.
- Margaret’s House was established in 1996 as a full-service child care center on campus. During the child enrollment process at Margaret’s House, priority status is granted to the children of RIT undergraduate and graduate students and therefore faculty and staff child care needs are sometimes unmet or delayed through waitlist processes. Open-ended feedback responses on the 2009 survey regarding Margaret’s House were positive. However, based on climate survey results, women see more value in extended child care hours (42% vs. 12%) and more on-site/near child care (40% versus 17%) as compared with men in regards to improving the overall quality of work/life balance.
- Faculty Exit Interview procedure and survey instrument under development by Human Resources and Academic Affairs (2010) will provide information regarding reasons behind faculty attrition.

Therefore, most of the “structures” with the exception of Margaret’s House and the RIT Center for Women and Gender are relatively new and in some cases not yet vetted completely or funded. Accordingly, it is not possible to assess the success of the structures. Fully answering the final research question is ongoing and the answers to this question and the others will help shape a larger institutional transformation strategy for RIT.

## 7. Accomplishments of the EFFORT@RIT Project

Answering research questions 1-6 served as a thorough self-study and evaluation for RIT where a great deal of new information was learned, several accomplishments were achieved, and existing structures were leveraged as well as some new structures put into place.

Examples of data which were readily known prior to the start of this study and which served as motivators for the work include:

- The representation of women T TT STEM faculty has remained relatively unchanged since 2001.
- During this same time period and for many years prior, the representation of women T TT faculty at RIT has also remained nearly constant at 30%. In 2009, there were 242 female T TT faculty members at RIT representing 30.10% of the total T TT faculty.
- The representation of women undergraduate students at RIT has remained nearly constant for over two decades at approximately 30%.

There were some glimmers of hope among the data findings including:

- During the 2006 - 2010 timeframe, there was no significant difference in the tenure denial rate for women and men, with a 6.25% denial rate for female faculty and 9.8% for male faculty.
- Female and male faculty within the largest STEM colleges tend to spend equivalent time in rank at assistant professor before being promoted to associate professor.
- Of the leadership committee positions identified in this study, 33.43% are held by females, closely matching the percentage of all female faculty at RIT.
- STEM leadership titles held by women faculty align with their representation within this population.
- Faculty reporting a sexist environment has declined. In 2009, 18% of female respondents and 6% of male respondents feel the campus tends toward being sexist as compared with 34% of female faculty respondents and 15-20% of male faculty respondents in 2002-03 campus wide climate survey.
- With regard to tenure, 84% of female respondents and 90% of male respondents feel that neither sex gets preferential treatment during the tenure process (16% of females feel that males get preferential treatment, while 8% of males feel that females get preferential treatment). In 2002-03, 65% of female as compared with 54% of all faculty respondents did not agree that the tenure process was fair for all.
- 30% of female faculty report having a mentor, compared to 18% of male faculty ( $p < 0.01$ ).

The vast majority of the findings of this research reveal opportunities for closely examining the existing structures in place at RIT to address barriers to the recruitment and advancement of women faculty. Most of the research findings reported thus far from this study are new discoveries for RIT. Therefore if measures and structures are in place, they were created without this information.

## 8. Conclusions

The ADVANCE IT-Catalyst project, “Establishing the Foundation for Future Organizational Reform and Transformation at Rochester Institute of Technology” identified barriers to the recruitment and advancement of women STEM faculty. Climate survey results, in conjunction with the objective data review and benchmarking information, lead to the identification of barriers involving *career navigation*, *climate*, and *flexibility/options for managing the work/life balance*. Issues related to career navigation could be caused by women’s self-agency and negotiation skills, coupled with a lack of “sponsorship” from more seasoned faculty and/or administration, hinder the success of female faculty in obtaining more advantageous starting packages, assignments, compensation, and promotion. Climate issues are exacerbated by women’s view of the workplace in personal terms, as opposed to a more male process-oriented view, meaning that issues of connectedness, support, and interpersonal relations, are important to their success. Overall satisfaction for men and women seems to be tied to faculty perception of value and influence, and to a lesser extent to one’s view of the department climate. Finally, managing work/life balance through flexible work arrangements, available and convenient child care, and tenure clock adjustments, may lower stress and increase satisfaction, and potentially aid in the retention of female (and male) faculty.

## 9. Acknowledgements

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## 10. References

- 1 National Science Foundation, Division of Science Resources Statistics. 2011. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2011*. Special Report NSF 11-309. Arlington, VA. Available at <http://www.nsf.gov/statistics/wmpd/>, downloaded Nov 4, 2011. TABLE 7-2. S&E doctoral degrees awarded to women, by field: 2000–08.
- 2 National Science Foundation, *S&E Doctoral Degrees Awarded to Women, by Field: 2000–08*, Table F-2, Women, Minorities, and Persons with Disabilities in Science and Engineering. Available from <http://www.nsf.gov/statistics/wmpd/tables.cfm>, downloaded 25 February 2011.
- 3 RIT, *RIT Climate Study: Perceptions of Faculty, Students, and Staff*, April 2003. Available from <http://www.diversity.rit.edu/docs/climatestudy.pdf>, downloaded 17 January 2011.
- 4 Preston, Anne, “Leaving Science: Occupational Exits of Scientists and Engineers,” Presentation at Joint Society Conference on Increasing Diversity in the Earth and Space Sciences [IDEaSS Conference] American Center for Physics in College Park, Maryland, June 2003.
- 5 Rosser, Sue V.; Lane, Eliesh O’Neil; “Key Barriers for Academic Institutions Seeking to Retain Female Scientists and Engineers: Family-Unfriendly Policies, Low Numbers, Stereotypes, and Harassment,” *Journal of Women and Minorities in Science and Engineering* 8, pp.161-189, 2002.

- 6 Diana Bilimoria, Susan R. Perry, Xiangfen Liang, Patricia Higgins, Eleanor P. Stoller, and Cyrus C. Taylor, "How Do Male and Female Faculty Members Construct Job Satisfaction?" presented at the 2005 NSF-ADVANCE Meeting in Washington, D.C. Available from [http://www.case.edu/admin/aces/resources.htm?nw\\_view=1294780243&](http://www.case.edu/admin/aces/resources.htm?nw_view=1294780243&), downloaded 25 February 2011.
- 7 Allen, Tammy D. and Eby, Lillian T., "Factors Related to Mentor Reports of Mentoring Functions Provided: Gender and Relational Characteristics," *Sex Roles* 50, pp. 129-139, 2004.
- 8 Girves, Jean E.; Zepeda, Yolanda; and Gwathmey, Judith K.; "Mentoring in a Post-Affirmative Action World," *Journal of Social Issues*, 61(3), pp. 449-479, 2005.
- 9 National Academy of Sciences, National Academy of Engineering, and Institute of Medicine Beyond, *Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*, Committee on Maximizing the Potential of Women in Academic Science and Engineering, 2007.
- 10 Committees on the Status of Women Faculty, "Report of the School of Engineering" Massachusetts Institute of Technology, March 2002.
- 11 National Research Council, "To Recruit and Advance: Women Students and Faculty in U.S. Science and Engineering," Committee on the Guide to Recruiting and Advancing Women Scientists and Engineers in Academia, Committee on Women in Science and Engineering, 2006.
- 12 Chesler, Naomi C. and Chesler, Mark A., "Gender-Informed Mentoring Strategies for Women Engineering Scholars: On Establishing a Caring Community," *Journal of Engineering Education*, pp. 49-55, 2002.
- 13 Ibarra, Herminia; Carter, Nancy M.; and Silva, Christine; "Why Men Still Get More Promotions Than Women," *Harvard Business Review*, September 2010.
- 14 Nolan, Susan A.; Buckner, Janine P.; Marzabadi, Cecilia H.; and Kuck, Valerie; "Training and Mentoring of Chemists: A Study of Gender Disparity," *Sex Roles* 58, pp. 235-250, 2008.
- 15 Judge, Timothy A.; Kammeyer-Mueller, John; and Bretz, Robert D., "A longitudinal model of sponsorship and career success: a study of industrial-organizational psychologists," *Personnel Psychology*, 57, pp. 271-303, 2004.
- 16 Foschi, Martha, "Double Standards in the Evaluation of Men and Women." *Social Psychology Quarterly* 59(3), pp. 237-254, 1996.
- 17 Shackelford, Susan; Wood, Wendy; Worchel, Stephen; "Behavioral styles and the influence of women in mixed-sex groups," *Social Psychology Quarterly* 59(3), pp. 284-293, 1996.
- 18 Steinpreis, R. E.; Anders, K. A.; and Ritzke, D.; "The Impact of Gender on the Review of the Curricula Vitae of Job Applicants and Tenure Candidates: A National Empirical Study," *Sex Roles* 41(718), 1999.
- 19 Dey, Eric L.; Korn, Jessica S.; and Sax, Linda J.; "Betrayed by the Academy: The Sexual Harassment of Women College Faculty." *The Journal of Higher Education* 67(2), pp. 149-73, 1996.
- 20 Myria Watkins Allen, Deborah J. Armstrong, Cynthia K. Riemenschneider, and Margaret F. Reid, "Making Sense of the Barriers Women Face in the Information Technology Work Force: Standpoint Theory, Self-disclosure, and Causal Maps," *Sex Roles*, 54, pp. 831-844, 2006.

- 21 National Science Foundation, Division of Science Resources Statistics, *Gender Differences in the Careers of Academic Scientists and Engineers*, NSF 04-323, Project Officer, Alan I. Rapoport, Arlington, VA, 2004.
- 22 Mason, Mary Ann and Goulden, Marc, "Do Babies Matter? The Effect of Family Formation on the Lifelong Careers of Academic Men and Women." *Academe* **88**(6), November 2002-December 2002.
- 23 Berube, Michael, "Professors Can Be Parents, Too." *Chronicle of Higher Education* **48**(31), pp. B12-13, 2002.
- 24 Sutor, J. Jill; Mecom, Dorothy; Feld, Ilana S.; "Gender, household labor, and scholarly productivity among University professors," *Gender Issues* **19**(4), pp. 50-67, Fall 2001.
- 25 Harvard University Faculty Climate Survey 2006/7 Report, prepared by Institutional research & Faculty Development and Diversity.
- 26 ADVANCE University of Michigan "Assessing the Academic Work Environment for Scientists and Engineers (2002)". Available from [http://sitemaker.umich.edu/advance/campus-wide\\_climate\\_for\\_faculty](http://sitemaker.umich.edu/advance/campus-wide_climate_for_faculty), downloaded 28 February 2011.
- 27 ADVANCE University of Wisconsin-Madison "Survey of Faculty Worklife (2006)". Available from <http://wiseli.engr.wisc.edu/advance.php>, downloaded 28 February 2011.
- 28 Kanter, R. M.; "Some Effects of Proportions on Group Life: Skewed Sex Ratios and Responses to Token Women." *American Journal of Sociology*, **82**(5), pp. 965-990, 1977.
- 29 Etzkowitz, H.; Kemelgor, C.; and Uzzi, B.; *Athena Unbound: The Advancement of Women in Science and Technology*. Cambridge: Cambridge University Press, 2000.
- 30 Bailey, M., Marchetti, C., DeBartolo, E., Mason, S., Valentine, M., Baum, S., Mozrall, J., & Williams, G. (2011). Establishing the Foundation for Future Organizational Reform and Transformation at a Large Private University to Expand the Representation of Women Faculty, *Proc. 2011 American Society for Engineering Education Annual Conference & Exposition*, Vancouver, BC, June. Accessed Nov. 3, 2011 from <http://nsfadvance.rit.edu/publications-and-documents>.
- 31 Marchetti, C., Bailey, M., Baum, S., & Mason, S. (2012). Perceived Levels of Faculty Value, Influence, and Satisfaction by Gender, Rank, Ethnicity, College, and Department at a Large Private University. *Proc. 2012 American Society for Engineering Education Annual Conference & Exposition*, San Antonio, TX, June.
- 32 University of Colorado-Boulder 2003 Faculty Climate Survey Report: "Interpersonal Relations, Collegiality, Leadership, Mentoring, Diversity, and Institutional Support According to Research and Teaching Faculty in 2003."
- 33 Rice University Academic Climate Survey Technical Report, June 2003.
- 34 University of Wisconsin-Madison Women in Science and Engineering Leadership Institute "Results from the 2003 survey of Faculty Worklife at UW-Madison."
- 35 Hult, Christine, Callister, Ronda, and Sullivan, Kim; "Is There a Global Warming Toward Women in Academia?" Association of American Colleges and Universities, Liberal Education, Summer/Fall 2005. Available from <http://www.aacu.org/liberaleducation/le-sufa05/le-sufa05perspective.cfm>, downloaded 25 FEB 2011.
- 36 The Chronicle of Higher Education. "A Drive to Diversify the Faculty Yields Results in Rochester" (Feb. 28, 2010). Available at <http://chronicle.com/article/A-Drive-to-Diversify-the/64384/>, downloaded 1 Mar 2011.

37 Progress Toward NSF ADVANCE: Institutional Transformation Goals - Proposed Toolkit for Reporting, ADVANCE Institutional Transformation Indicators Working Group1, January 2005.