

No More Duct Tape! Institutionalization of Advance Initiatives

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Abstract

NSF Advance-funded institutional transformation (IT) projects come with prestige and funding to launch initiatives aimed at transforming the organization and ultimately increasing the representation of women STEM faculty while improving their career journeys. Activities such as professional development workshops, networking opportunities, data collection and analysis can be welcomed by faculty and administrators for the value they add at little cost to the institution. However, external funding serves as “duct tape” adhering these activities to the university structure. Activities are best placed to continue beyond external funding when they are embedded in the university structure during the IT project. A large private university, in its fifth year of an IT grant (NSF ADVANCE #1209115), has several Advance initiatives in the process of institutionalization. These include Support for New Parents, Faculty Climate Data, Faculty Exit Survey Process, Dual Career Assistance Program, Faculty Objective Data (NSF Indicators), and Faculty Salary Equity Analysis. This paper describes a subset of the IT activities underway at RIT, highlighting progress toward sustainability based on the practice of initiating, partnering, and policy making.

Institutional Context

Rochester Institute of Technology (RIT) is a privately endowed, coeducational university with nine colleges emphasizing career education and experiential learning. The student body consists of approximately 15,400 undergraduate and 3200 graduate students. Enrolled students represent all fifty states and more than 100 countries. Nearly 3200 students from diverse racial and ethnic backgrounds are enrolled on the main campus along with approximately 2700 international students. RIT is an internationally recognized leader in preparing deaf and hard-of-hearing students for successful careers in professional and technical fields. The university provides unparalleled access and support services for the more than 1200 deaf and hard-of-hearing students who live, study, and work with hearing students on the RIT campus.

Over the past twenty years, RIT has committed substantial resources to diversifying the university population and to developing educational, structural, and policy measures to ensure its ongoing health and prosperity. In 1998, a University Diversity Action Plan was written; the position of assistant provost for diversity was created to oversee the implementation of the action plan; and a unique and highly successful African American, Latino American, and Native American (AALANA) faculty recruitment program was developed. As a result, the percentage of AALANA tenured and tenure-track (T/TT) faculty grew to 9.8%^[1]. In 2007, the university’s new president introduced two gender-related performance commitments to support strategic goals focused on increasing both the percentage of entering undergraduate women and the percentage of women T/TT faculty^[2]. Several initiatives are aligned in support of these goals, including formalization of the President’s Commission on Women and the creation of part-time Faculty Associate positions within the Provost’s Office to support women and AALANA faculty. In 2015, the university included a ‘difference maker’ focusing on women as part of the 2015 - 2025 Strategic Plan with the position that “RIT will be the largest producer of female, under-

represented male, and deaf or hard-of-hearing STEM graduates among all private colleges in the U.S.”^[3].

NSF ADVANCE

The National Science Foundation (NSF) has dedicated funding to support programs to improve the retention, recruitment and advancement of STEM women faculty through the NSF Advance: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers program. There have been significant advances in the number of women obtaining STEM doctorates but this has not translated to increased representation in faculty ranks^[4]. ADVANCE is designed to identify and eliminate organizational barriers and develop initiatives that foster gender equity^[5].

The ADVANCE program provides substantial funding to institutions. The 2016 Program Solicitation anticipated funding \$22.2 million for grants^[5]. Ideally, funding leads to long-term, positive impact at a university and as such, nearly all federal funding programs require a sustainability plan as part of the proposal process. The NSF ADVANCE program has a goal “to develop innovative and sustainable ways to promote gender equity that involve both men and women in the STEM academic workforce”^[5] and specifically states that “IT awards should create positive, sustainable, and permanent change in the institution.” In fact, the NSF Program Solicitation provides the following instructions for potential grantees related to sustainability:

Sustainability should be considered at every stage of project implementation and should become a specific project activity with dedicated staff time at least from the third-year site visit through to the end of the project^[5].

Grant money supports new activities, but the question arises as to what happens once the money is gone? At the end of a well-executed Institutional Transformation project, activities are no longer needed or they have been integrated into the fabric of the university. Qualitative and quantitative data with respect to activities as “readily adaptable, effective and attainable,” along with the costs associated with the efforts, lead to critical conversations which serve as the foundation for selecting efforts to institutionalize and determining methods to do so^[6].

A 2013 article by Morimoto, Zajicek, Hunt, & Lisnic^[7] analyzed the initiatives of four cohorts of ADVANCE schools. The authors suggest that, “Creating equity involves attention to the mechanisms of institutional practice rather than implementing a static policy or a fixed set of goals” (p. 400). As such, they suggest examining programs focused on individuals and programs focused on cultural and organizational change. The authors examined the “conceptualization patterns” of ADVANCE programs and found that the prevalent initiatives of these programs addressed:

- Representation of women faculty, from recruitment and hiring to retention and advancement;
- Gender biases in expectations and performance appraisals, and attempts to change the culture around masculine academic work and the climate for women ;
- Programs to provide access for women to mentoring and networking;

- Transparency in and coordination of policies and procedures across the university;
- Distribution of material resources;
- Building accountability for equity goals into initiatives.

In short, institutional transformation requires sustained initiatives that address the mechanisms of gender inequality, challenge the long-standing images of model employees, and develop institutions to be transparent and accountable.

Prior research by Litzler, Claiborne and Brainard^[8] notes the important distinction between sustainability and institutionalization (p. 2), “*Sustainability* of a program can be achieved with external funding and no institutional support. *Institutionalization* is achieved when the university makes a “permanent” financial commitment (i.e. line item) to a project or some aspect thereof.” The authors go on to state the four key aspects of institutionalization as value, leadership, stability, and diffusion. The discussion cites Curry^[9], who stresses the importance of institutionalization to the process of organizational change. Litzler, et al. continue to write that (p. 5), “For Curry, institutionalization involves the stabilization of the system after the organizational change has occurred. If changes or innovations are not institutionalized, they are likely to be terminated.” Integrating the four key aspects of institutionalization with the conceptualization patterns of Advance projects may serve as a useful context in which to consider specific initiatives at current Advance funded schools.

AdvanceRIT

The goal of the ongoing institutional transformation project at RIT is to increase the representation and advancement of women STEM faculty widely across ethnic, social, and cultural backgrounds. This goal would be accomplished by removing barriers to resources that support career success and by creating new interventions and resources. An additional emphasis adapts interventions to address the needs of key sub-populations classified by ethnicity or hearing-status.

In preparation for creating an appropriate transformational strategy, researchers conducted a self-study (NSF ADVANCE #0811076) from 2008-2011 to identify career advancement barriers for current women faculty and to establish how well the university addresses issues found to be important in their recruitment, retention, and advancement. Results of a 2009 faculty climate survey, conducted in conjunction with an objective data review and benchmarking, led to the identification of barriers in the areas of career navigation, climate, and flexibility in work/life management balance on which there has been previously reporting^[10-12].

The AdvanceRIT project adopted a multi-frame organizational analysis approach from Bolman and Deal^[13] to improve understanding of organizational issues at the university. This approach integrates several aspects of organizational theory, including structural, human resources, political, and symbolic perspectives, and suggests the use of each as a “frame” or “lens” for viewing the organization and the strategic approaches created to change the organization^[14]. This approach has been instrumental in improving understanding of our organization; ensuring that our set of proposed interventions are designed to positively impact the institution at the structural, human resource, political, and symbolic levels; and strongly supporting the

institutionalization of successful grant activities beyond the length of the grant, due to the broad and embedded nature of the proposed interventions.

In 2012, the university was awarded a \$3.2 million NSF Advance Institutional Transformation (IT) grant: AdvanceRIT - CONNECT: Increasing the Representation and Advancement of Women Faculty at RIT. The IT project’s objectives^[15] (with reference to Bolman and Deal lens for each) are listed in Table 1:

Table 1: Institutional Transformation Project Objectives

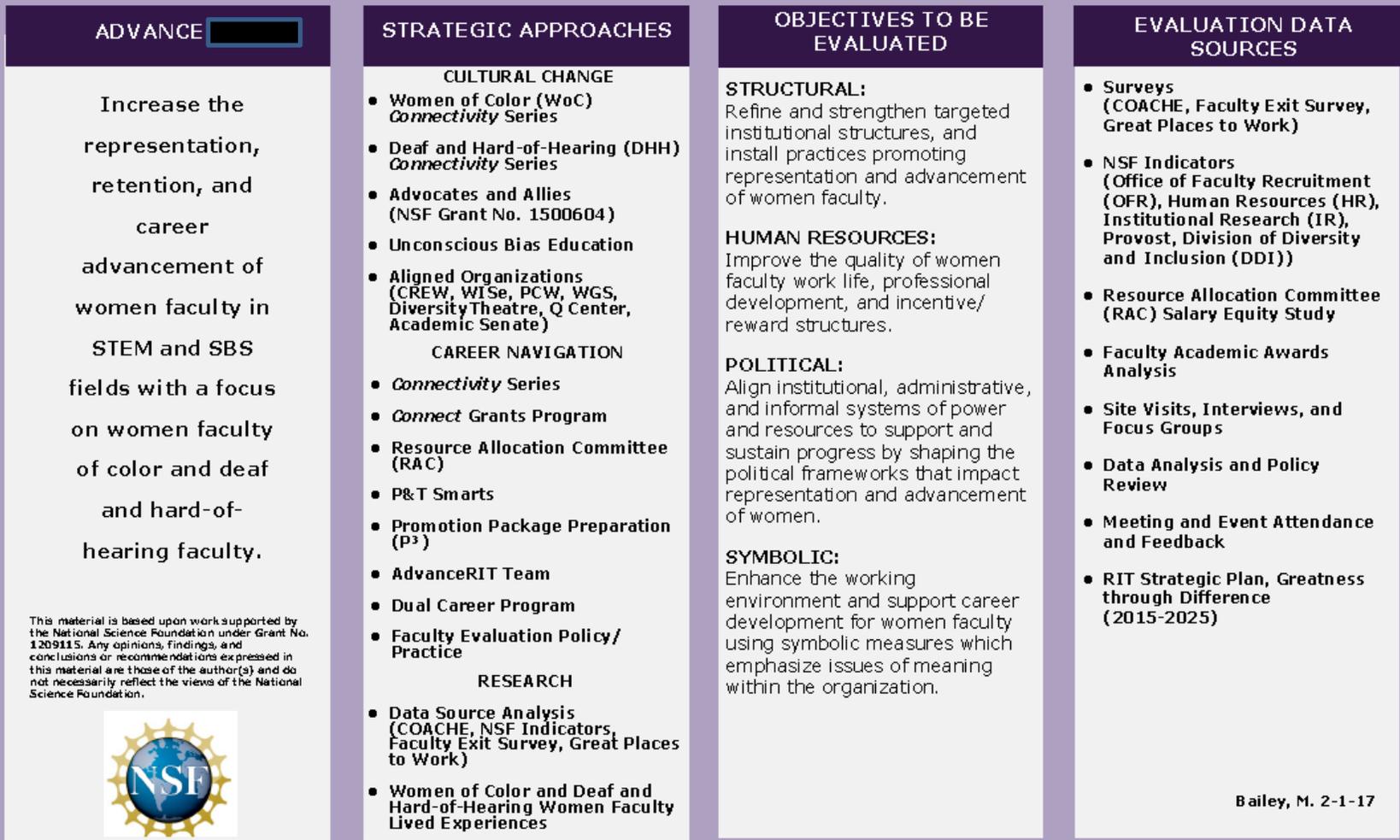
Objective	Bolman & Deal Lens
1. Refine and strengthen targeted institutional structures, and install practices promoting representation and advancement of women faculty.	Structural
2. Improve the quality of women faculty work life, professional development, and incentive/reward structures.	Human Resources
3. Align institutional, administrative, and informal systems of power and resources to support and sustain progress by shaping the political frameworks that impact representation and advancement of women.	Political
4. Enhance the working environment and support career development for women faculty using symbolic measures that emphasize issues of meaning within the organization.	Symbolic

The project team created a comprehensive array of programs and initiatives to support achievement of the project objectives and project goal. Activities are led by members of the grant’s leadership team and are divided into three broad categories including cultural change, career navigation, and research. A project Logic Model (Figure 1) graphically represents the relationships between project goals, objectives, strategic approaches, and relevant evaluative data sources.

Figure 1: AdvanceRIT Project Logic Model



LOGIC MODEL FOR PROJECT EVALUATION



Institutionalization

For the AdvanceRIT project, progress toward sustainability within university structures for grant activities can be attributed to a practice of initiating, partnering, and policy making. Change initiatives began with Advance team members and key campus partners identifying barriers. Partnerships allowed the campus to provide input and feedback on new initiatives. New policies and procedures formalized practices for use by faculty and administration. The initiating, partnering, and policy making practice is further described in Table 2.

Table 2: Initiating, Partnering, and Policy Making Practice

Step 1: Initiating 	Step 2: Partnering 	Step 3: Policy Making 
Advance team members and key campus partners “Shine a Light” on barriers and opportunities through literature reviews, benchmarking, and objective data analysis, then provide a structure for change initiatives.	Partnerships between Advance and existing campus entities provide exposure for new initiatives and allow the campus to provide input and feedback. Governance groups and administrative offices are key.	Institutionalization occurs by establishing policies and procedures that faculty and administrators can use. Faculty policy is created through shared governance. University policies and procedures are created through administrative offices such as Human Resources and Institutional Research.

Several Advance initiatives are in the process of being institutionalized. These include Support for New Parents, Faculty Climate Survey Administration and Response Data Analysis and Dissemination, Faculty Exit Survey Process, Dual Career Assistance Program, Faculty Objective Data (NSF Indicators), and Faculty Salary Equity Analysis. We describe the institutionalization of two of these initiatives below.

Faculty Climate Data: Understanding the climate of a university from a faculty perspective allows for informed decisions on processes and policies. As part of the structural strategic approaches within the IT grant, the university administered a campus-wide faculty climate survey through Harvard University’s COACHE program. The implementation of this significant work followed the pattern of institutionalization through collaboration, using a practice of initiating, partnering, and policy making. The Advance team played a key role in initiating the use of a campus-wide climate survey instrument specifically for faculty. In 2009 as part of an earlier IT-Catalyst grant, the team launched a self-created instrument that successfully provided data for the research team and key players across the university. This experience provided the catalyst for implementation of a broader instrument.

As part of the Advance project, the grant team partnered with Academic Affairs, Human Resources, the Office of Diversity and Inclusion, and the Wallace Center to initiate the implementation of COACHE in 2012. A task force was created, providing an opportunity for partnership between members of the Advance team, tenured and non-tenured faculty, experts in communication and the director of the Faculty Career Development Services center. The task force created and facilitated communication and developmental strategies to address the university's COACHE results and played a role in disseminating results to parties on campus that could analyze the information from several perspectives. The taskforce worked with the deans and provost to identify areas of celebration and areas for improvement. These results were shared in college meetings presented by each dean and an Advance team member, town hall meetings hosted by the provost, public dissemination of the provost's report and a video update made by the provost. Members of the Advance team took on the responsibility of analyzing the results by hearing status and by gender/ethnicity. A subsequent summary report was shared broadly. The first round of COACHE resulted in significant discussion across campus, policy changes through the faculty governance process, and a shifting of priorities at the college and university levels.

As the university approached the second round of COACHE, the taskforce was re-established to assist in the transition of oversight of the COACHE survey process from the Advance team to Faculty Career Development Services and the Office of Institutional Research. During the 2015-16 round of the survey, the implementation responsibilities for COACHE shifted away from the grant team to the director of the Faculty Career Development Services center, under the direction of the Provost. Once again the task force provided an opportunity for multiple stake holders including Advance to play a role in development of the communication plan for implementation and data dissemination. Results from the survey were also shared with college deans, Advance team members and other faculty associates to allow for analysis from various perspectives. The second-round results are currently being examined for deeper understanding and dissemination. The process is more established, more broadly accepted and administrators are now seeking the information to help them in making more informed decisions.

Salary Equity Study: Prior to the IT grant, and in support of the IT-Catalyst grant, the university conducted a 2010 faculty salary equity study that found instances of unexplained salary differences along gender lines. This mirrored national findings that demonstrate historical gaps in salaries for women across many fields^[16-19]. In response to the findings, the university established a pool of funding to address the salary inequities due to compression and gender related issues. The Provost and Deans reviewed any potential areas of inequity. Where identified, initial faculty salary adjustments occurred in the fall of 2010. Similar adjustments occurred in the years following. Follow-up analysis would determine the success of the redress process. However, additional analyses conducted by the university did not include faculty collaboration or input, and the analysis process and results were not evident to the campus. The Advance team saw an opportunity to build more transparency into the overall process.

In 2012, the funded institutional transformation project commenced, including the effort for a comprehensive faculty salary equity study. NSF offers a toolkit to grantees describing the basic components of the required salary equity study^[20] and the American Association of University Professors provides extensive guidelines^[21] for such studies. To conduct the salary equity study

in a manner in which stakeholders would ideally have a high-level of confidence in its results, Advance initiated the formation of a collaborative and cross-university Resource Allocation Committee (RAC) comprised of administrators and faculty with expertise in statistical analysis, faculty hiring and evaluation processes, institutional data, and gender equity considerations. By providing an inclusive framework, the grant team aimed to increase transparency in the salary equity study process and promote internal (campus) dissemination of the methodology used and results observed. Together, this collaborative group of faculty and administrators developed a deep understanding of the statistical study and a high-level of confidence in the study's outcomes. In the spring of 2016, the statistical analysis and executive summary were completed. In the faculty population under study, the difference in salary by gender was examined after accounting for other variables such as discipline, rank, time in rank, and most recent performance rating. This difference was less than 2%, a figure which is considered to be negligible by many compensation professionals.

As a result of the confidence in the overall process, the university administration disseminated the executive summary of the salary study report to the campus. With the support of the RAC, the university has begun presenting the results to the faculty of individual colleges, along with information about salary processes at the university, so that faculty and department heads have a basis for productive dialogues around salary. Questions raised by faculty at these presentations have prompted the addition of performance rating analysis by gender in the next salary equity study.

The university has recently asked the RAC to engage in this year's annual salary equity study, continuing the collaborative and transparent nature of the process. The next step is to formalize a RAC-like entity in university policy, thereby institutionalizing the work of the group. Avenues for implementation are currently being discussed and potentially include an advisory group to Human Resources for salary studies or a presidential-level committee to examine salary-related issues.

Next Steps

As the Advance project reaches the end of the five-year grant period, the team continues to consider, *how do we further institutionalize the initiatives of Advance at our university and how do we continue the momentum for inclusive change?* For suggestions, we turned to our External Advisory Board (EAB), who offered the suggestions^[22] listed in Table 3.

The EAB's suggestions provide a grounding and framework as key aspects of institutionalization^[7]. Advance's centrality to the university strategic plan illustrates value, involving the Board of Trustees involves leadership, a center for research would provide stability, and opening programs to all faculty creates diffusion. Through careful implementation of the recommendations, we hope to develop and sustain mechanisms that support gender equality, create new images of model employees, and build transparency and accountability within the university.

Table 3: External Advisory Board Suggestions

Engage	1. Engage new university leaders to be proactive in symbolic and resource-based support of Advance initiatives in particular, and inclusive change efforts, in general.
Involve	2. Involve the Board of Trustees in creating organizational goals and structures to sustain the outcomes of an integrated diversity agenda that fully incorporates gender.
Communicate	3. Communicate and exploit the centrality of Advance in the university's strategic plan. Think creatively about funding sources such as repurposing current internal grants or funds, cost-sharing with college deans and related units, and emphasize the diversity-focused and interdisciplinary nature of Advance work.
Open	4. Open Advance career navigation/professional faculty development programs to ALL faculty, to the degree possible. At the same time, continue to strongly encourage and support the engagement of women, AALANA, and deaf and hard-of-hearing faculty.
Conceptualize	5. Conceptualize a center for research devoted to an expanded set of Advance goals. Continue to heighten awareness of issues faced by faculty who are AALANA and Deaf and Hard of Hearing.

Conclusions

The campus can celebrate numerous successes achieved over the IT grant period. The move toward data-driven initiatives is to be applauded. Administration of the COACHE survey is an excellent way to gauge faculty perceptions of campus climate. By collecting this data and disseminating the results, the university can begin to foster dialogues around sensitive issues. Conducting a salary equity study that is a collaborative effort between faculty and administrators allows a close examination of salary and instills confidence in the outcomes of the study. Dissemination and discussion of the salary study results provides insight to faculty on factors that influence salary and open the door for conversations about this delicate topic.

A cautionary note must be included here to avoid over-reliance on data. As new researchers in many fields discover, data frequently raises more questions than it answers. When that data regards human beings, understanding the issues often requires a more personal (and time consuming) approach – talking to people! Data may drive the creation of initiatives, but to weave them into the university fabric they need to address core needs. To truly understand a university's COACHE survey results, one must do more than read the report. It is imperative to hear the stories behind the survey responses, and this requires trust. Focus groups, one-on-one conversations, and regular interactions build relationships that allow people to share confidences. An online survey will never do this. Similarly, seeing the results of a salary equity study provides valuable information to faculty. Yet despite the “negligible” gender difference seen in the university salary study, salary equity continues to be a concern for many women faculty. It is important for department chairs to examine the salaries of their faculty and to be accountable for any unexplainable differences by gender. They must also be able to have open conversations about salary with faculty without gender-related consequences (i.e. penalizing women for

requesting more money).

The AdvanceRIT project has attained progress toward institutionalization within university structures for grant activities through a practice of initiating, partnering, and policy making. Advance team members and key campus partners commence change initiatives by identifying barriers. Once a new program is developed, input and feedback gathered through campus partnerships. Finally, successful ideas inform policies and procedures to formalize new practices.

Acknowledgements

Support for this research was provided by the National Science Foundation ADVANCE Institutional Transformation program under Award No. 1209115. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

References

- [1] RIT Human Resources and Institutional Research (2015). NSF Indicator Data/Faculty Counts. Unpublished Data.
- [2] Imagine RIT: RIT's Strategic Plan 2005-2015. Accessed November 12, 2016. <http://www.rit.edu/president/strategicplanning/plan.php>
- [3] Rochester Institute of Technology, Office of the President (2014). "Greatness Through Difference: RIT's 2015-2025 Strategic Plan," https://www.rit.edu/president/strategicplan2025/pdfs/strategic_plan.pdf. Accessed Feb 10, 2017.
- [4] C. Hill, C. Corbett, and A. Rose, AAUW, Ed. *Why So Few*. Washington D.C.: American Association of University Women, 2010.
- [5] "ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers," *National Science Foundation*, Available: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383
- [6] K. (2009). Transforming Science and Engineering: Advancing Academic Women—By Abigail Stewart, Janet Elizabeth Malley and Danielle LaVaque-Manty. *Review of Policy Research*, 26(6), 890-892.
- [7] Morimoto, S. A., Zajicek, A. M., Hunt, V. H., & Lisnic, R. (2013). Beyond binders full of women: NSF ADVANCE and initiatives for institutional transformation. *Sociological Spectrum*, 33(5), 397-415.
- [8] Litzler, E., Claiborne, C., & Brainard, S. G. (2007). Five years later: The institutionalization and sustainability of ADVANCE. In *ASCE Annual Conference Proceedings*.
- [9] Curry, B. (1992). Instituting enduring innovations: Achieving continuity of change in higher education. Washington, DC: *ASHE-ERIC Higher Education Report, No 7* (ERIC Document Reproduction Service No 358 809)
- [10] "RIT_EFFORT_Career_Life_Survey.pdf" NSF ADVANCE RIT (2009, October). Accessed Oct. 18, 2014 from <http://nsfadvance.rit.edu/effort/>. 2 Bailey, M., Baum, S., Mason, S., Mozrall, J. Valentine, M., DeBartolo, ... Williams (2011 August). Establishing the Foundation for Future Organizational Reform and Transformation: Status of Women Faculty at RIT Regarding Recruitment, Representation, and Advancement (Final Project Report for

- NSF # 0811076, ADVANCE Institutional Transformation – CATALYST). Accessed Nov. 12, 2016 from <http://nsfadvance.rit.edu/effort/>.
- [11] Bailey, M., Marchetti, C., DeBartolo, E., Mason, S., 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.
- [12] Marchetti, C., M. Bailey, S. Mason, S. Baum, & M. Valentine. (2012). Perceived levels of faculty value, influence, and satisfaction by gender, rank, ethnicity, college, and department at a large private university. 2012 ASEE Annual Conference and Exposition, San Antonio, TX. 10-13 June 2012. n.p. Web.
- [13] Bolman, L. & Deal, T. (1991). Reframing organizations: Artistry, choice, and leadership. San Francisco, CA: Jossey-Bass.
- [14] Austin, A., Laursen, S., Hunter, A., & Soto, M. (2011, April). Organizational Change Strategies to Support the Success of Women Scholars in Science, Technology, Engineering, and Mathematics (STEM) Fields: Categories, Variations, and Issues. Proc. Annual Conference of the American Educational Research Association, New Orleans, LA.
- [15] S. Mason *et al.*, "Institutional transformation at a large private technical university: Reporting on the accomplishments of a combined data driven top-down and bottom-up approach," in *Frontiers in Education Conference (FIE), 2014 IEEE*, 2014, pp. 1-8: IEEE.
- [16] Lips, H. M. (2013). The gender pay gap: Challenging the rationalizations. Perceived equity, discrimination, and the limits of human capital models. *Sex Roles*, 68(3-4), 169-185.
- [17] Jagsi, R., Griffith, K. A., Stewart, A., Sambuco, D., DeCastro, R., & Ubel, P. A. (2012). Gender differences in the salaries of physician researchers. *JAMA*, 307(22), 2410-2417.
- [18] Ginther, D. K., & Hayes, K. J. (2003). Gender differences in salary and promotion for faculty in the humanities 1977–95. *Journal of Human Resources*, 38(1), 34-73.
- [19] Fuller, R., & Schoenberger, R. (1991). The Gender Salary Gap: Do Academic Achievement, Internship Experience, and College Major Make a Difference?. *Social Science Quarterly*, 72(4), 715-26.
- [20] Frehill, L.M., Cannavale, C.J., Kehoe, P., Lange, S.E., Malley, J., Meader, E., Sheridan, J., Stewart, A. and Svinglin, H. (2005). Toolkit for reporting progress toward NSF ADVANCE: Institutional transformation goals. Retrieved from www.advance.vt.edu/documents/other/advance_indicators_toolkit.pdf (Accessed January 30, 2016).
- [21] Haignere, L. (2002). *Paychecks: A guide to conducting salary-equity studies for higher education faculty*. American Association of University Professors, 1012 Fourteenth Street, NW, Suite 500, Washington, DC 20005.
- [22] External Advisory Board Findings (2016). Assessment of and recommendations for the AdvanceRIT project. Unpublished report.