

Lehigh University ADVANCE: Building Community Beyond Academic Departments

1. Theory of Change at Lehigh University

Our goals are to improve the (i) recruitment, (ii) retention and (iii) career advancement of women STEM faculty through sustainable institutional transformation that relies on institutionally supported interdisciplinary (ID) organization. Our institutional transformation goals are paralleled by a social science research (SSR) initiative aimed at understanding how ID research and teaching influences careers of women STEM faculty. Our hypothesis was that ID organization, if scaffolded by proactive policies, practices and procedures—including those for tenure and promotion evaluation and for mentoring and networking—will bring about the desired environmental change that facilitates our Lehigh University ADVANCE (LU ADVANCE) goals. Our smaller size, which may make departmental-based critical mass difficult, is expected to make ID connections easier. Lehigh's 2009 Strategic Plan, "Advancing Our Intellectual Footprint," proposes growth during the next 10 to 15 years through "cluster faculty hires" that cross disciplinary boundaries. Synergy between the Strategic Plan and LU ADVANCE helps our broad community to understand and commit to our goals across the campus.

LU ADVANCE is directed through a central office under the Provost and led by the core leadership team (CLT) of the co-PIs, program manager and co-directors. This group brings forward goal-directed tasks to a larger leadership team (LT), which includes the ADVANCE Chairs, Vice Provost for Academic Diversity (VPAD), and a senior scientist from the Social Science Research Center. The ADVANCE Chairs are tenured women STEM faculty who become full members of the LT from the year of their appointment forward. The LT discusses and prioritizes the proposed tasks and activities, passing them forward to the appropriate offices or groups to be put into motion. All activities are closely coordinated and managed by the ADVANCE co-directors and manager, and branded as LU ADVANCE. LU ADVANCE activities are reviewed annually by the External Advisory Committee and at least twice a semester by the Internal Advisory Committee (IAC), which provides feedback to the LT. The IAC is comprised of select STEM department chairs, the dean of the Rossin College of Engineering and Applied Science (RCEAS), the dean of the College of Arts & Sciences (CAS), the Deputy Provost for Faculty Affairs (DPFA), and women STEM faculty.

2. Progress on Specific Goals

LU ADVANCE has rolled out numerous initiatives directed at accomplishing the goals outlined above. Targeted communications including a brochure, website, regular e-mails, and promotional materials with our logo highlight the purpose of and opportunities available through LU ADVANCE. In this section we describe major activities in each arena, highlight evidence of specific impacts where appropriate, and provide overall evaluation of the progress toward each goal. Impacts and evaluation rely on feedback from specific activities, electronic surveys conducted in May 2011 (baseline) and November 2012 (progress), and internal and external evaluators. Note that retention and career advancement are covered together due to the highly intertwined nature of these goals.

2.1. Recruitment Initiatives: Conscious and deliberate recruitment of women STEM faculty hinges on environmental changes essential for institutional transformation. The activities below were designed by LU ADVANCE in collaboration with the VPAD to facilitate the environmental changes that support enhanced recruitment of women in STEM. LU ADVANCE has benefited greatly from the creation in 2011 of the VPAD administrative leadership position. The VPAD participates as a full LT member.

2.1.a. Best Practices and University Guidance: LU ADVANCE worked with the VPAD to develop two faculty recruitment documents. First, the [Faculty Recruitment: Best Practices for Diversity and Excellence](#) booklet was drafted during academic year (AY) 2010-11 and distributed both electronically and in hard copy to all faculty in August 2011. Second, the [Lehigh University Faculty Search Handbook Guidelines](#) appeared online in fall 2012 and was highlighted at a University faculty meeting. Additionally, the LU ADVANCE website section "Best Practices for Faculty Recruitment" represents an online tool kit of resources disseminated to colleges, departments and search committees.

2.1.b. Recruitment Seminar Awards: LU ADVANCE developed a small grant mechanism to encourage STEM departments to invite early career scholars to Lehigh to give seminars. The goal is to build relationships with women who may then be invited to apply for future faculty positions or provide help identifying future candidates. With increased advertising and growing popularity, this program has awarded 11 grants (seven in 2012-13).

2.1.c. Outreach: Outreach takes place at individual, committee, department, college, and university levels. The VPAD meets with all STEM search committees at least once, and interacts with them on a continuing basis. LU ADVANCE serves as a dynamic resource, meeting and consulting with individual search committees at various stages of the recruitment process. LU ADVANCE has met with RCEAS and CAS Deans about recruitment information needs.

On September 28, 2012, LU ADVANCE hosted the Cornell Interactive Theatre Ensemble (CITE) program “Effective Faculty Search Process—It Depends on the Lens: Unconscious Bias in the Faculty Search Process” for 42 faculty, including department chairs and search committee members. Feedback on this program demonstrated a desire for continued conversation and tangible tools to help minimize the negative impacts of unconscious bias. Leveraging this awareness and engagement, LU ADVANCE is coordinating with deans and search committee chairs to be actively involved in the search process. The ADVANCE co-directors and manager met with STEM department chairs individually and then with STEM department faculty at their faculty meetings throughout 2012. The ADVANCE co-directors presented at the RCEAS and CAS college faculty meetings. An online tutorial for search committee members was developed to supplement the Lehigh University Faculty Search Handbook Guidelines and reinforce the lessons learned from the CITE workshop. Finally, a case study panel compare/contrast session of past successful and unsuccessful searches will occur in spring 2013.

2.1.d. ID Hiring Policies: With a strategic emphasis on hiring ID faculty, it is important to document the expectations and workload of faculty hired to serve across multiple academic departments or programs/centers. In spring 2011 Provost Farrell charged an ad hoc committee of faculty members (with LT membership) across all four colleges and chaired by the DPFA to evaluate the policies, practices and culture that govern hiring procedures that include ID dimensions in teaching and/or research and scholarly work. In spring 2012 the Provost forwarded the report to the Faculty Personnel Committee (FPC). The report recommends that at a minimum, in addition to the offer letter, a memorandum of understanding be extended to cover all faculty members with significant ID interest.

2.1.e. Overall Evaluation of Recruitment Initiatives: The activities described above stimulate awareness of issues related to recruitment of women STEM faculty. The 2012 progress survey found that 82% of the STEM faculty who responded believe LU ADVANCE had at least somewhat of an effect on the university, and almost half of the faculty (49%) felt the environment changed at least somewhat, with increased emphasis on hiring women in STEM fields. A large percentage of both men and women believe the faculty hiring process is conducted fairly. However, more men agreed with this statement in the progress survey than at baseline, while the opposite was true of women. This may have occurred because of increased awareness of additional methods for recruiting women and unconscious bias in hiring decisions. Women continue to be well represented on search committees, but there is caution about their service load. The percentage of women hired rose slightly in the 2011-12 hiring season (36%) but one woman broke her contract. Preliminary evidence of more diverse search pools is emerging, though changes in institutional indicators (interviews, offers, hires) will not be available until the conclusion of the current search cycle. Based on qualitative interviews, all of the search committee chairs confirmed an increase in attention by the institution on the importance of a diverse faculty; however, there are varying levels of commitment to taking recommended steps to recruit and hire a diverse faculty.

We are fully aware that most of our STEM departments are still underrepresented in terms of gender diversity. A few of the departments remain all male, and several more have just one woman on the faculty. Significantly changing the culture and increasing the number of women in these departments remains our goal. Our data show improved awareness and active involvement of LU faculty, both men and women, to assist LU ADVANCE to reach this goal.

2.2. Retention and Career Advancement Initiatives: These initiatives are conducted by LU ADVANCE, the DPFA and Women, Gender and Sexuality Studies (WGSS). The activities below were designed to facilitate the environmental changes that support improved retention and career advancement.

2.2.a. Interviews: In addition to the electronic surveys, individual interviews of 20 women STEM faculty were conducted regarding job satisfaction and the value and opportunities for interdisciplinarity in the first year of the program in order to establish a baseline. These interviews help guide development of subsequent activities. These interviews will be repeated in 2015 to assess the impact of ADVANCE on individual women STEM faculty.

2.2.b. Lehigh University Women in Science and Engineering (LU-WISE) and Online Networking: LU-WISE was launched in fall 2010 and at least two LU-WISE luncheons or other activities have taken place per semester since that time. During fall 2012, LU-WISE took a hiatus to allow time for women to participate in other recruitment and retention activities scheduled throughout the semester. LU-WISE activities are aimed at reducing isolation of women STEM faculty and providing opportunities to share research interests, explore career development topics, and meet successful women who are speaking on campus. Faculty may suggest topics. One of the highlights of LU-WISE, introduced by President Alice Gast and coinciding with the 40th Anniversary of Undergraduate Women at Lehigh, was a special luncheon and mini-research symposium for the LU-WISE faculty and their female graduate and undergraduate research students where the discussions were focused on interdisciplinarity and mentoring.

Our proposal calls for the expansion of LU-WISE to the Lehigh Valley Association of Independent Colleges (LVAIC) women in STEM. A local symposium, “Interdisciplinary Scholarship Shapes STEM Careers of Women,” will take place on March 18, 2013 for STEM faculty of the neighboring LVAIC institutions. The four interconnected goals of the symposium are: 1) networking with Lehigh Valley STEM women in academia and industry; 2) interdisciplinary scholarship: how and why you do it; 3) understanding how to successfully navigate interdisciplinary STEM research at smaller institutions; and 4) brainstorming future broad impacts with regional collaborations.

We are in final development of an open access database populated with information about Lehigh women STEM faculty that allows a user to search with keywords for experts by area research for potential academic collaboration. There were technical and structural barriers that delayed the full launch of this tool, although pilot trials worked well. Both sets of issues have been resolved, and the full system is expected to become available in spring 2013.

The progress survey revealed that all of the women STEM faculty members who responded were aware of LU-WISE luncheons, and 84% of female respondents participated in them and found the opportunity to network valuable. Several women STEM faculty have forged collaborative vision and activities as a result. The LT continues to monitor the value of sustaining LU-WISE beyond the grant.

2.2.c. WGSS Seminar Series: Based on data from the baseline interviews, we identified topics for scholarly discussion that might lead to practice and policy actions and personal behavioral changes that could improve job satisfaction for women STEM faculty. In collaboration with WSSG, LU ADVANCE hosted several lectures devoted to these topics, including: Susan Basow, Lafayette College, about the subtle accumulated disadvantages women STEM faculty may experience in the classroom and ways to prevent that from negatively impacting careers; Lise Eliot, The Chicago Medical School of Rosalind Franklin University of Medicine and Science, about biological and societal induced differences between male and female brains with respect to STEM learning; and Donald Hall, dean of CAS, about unequal service burdens of women and men. Service and promotion to full professor will be further discussed through a lecture from Dana Britton, Rutgers University. The relationship between LU ADVANCE and WSSG leverages a respected campus network to explore and propose solutions to career issues that are important to women STEM faculty and that can impact all faculty at Lehigh.

2.2.d. Mentoring Program: LU ADVANCE and the DPFA launched a new voluntary mentoring program in fall 2011 for new and recently hired faculty with the formation of Interdisciplinary Networking Committees (INC). INC included one mentor from the new faculty member’s home department with similar research and/or teaching interests, one mentor from another discipline with intersecting or overlapping research and/or teaching interests, and a third mentor capable of adding an

additional helpful dimension. Based on spring 2012 positive and constructive feedback from the first cohort of 14 INC participants (including two STEM women and 6 STEM men), its structure was revised for new faculty members joining the university in fall 2012. Under a new “matched pairs” design, the 10 new faculty enrolling (including 1 STEM woman and 3 STEM men) were assigned a mentor from her/his home department or a closely related one, and then each mentor/mentee pair is matched with another pair for which there is at least some degree of intersecting or overlapping research and/or teaching interest.

2.2.e. Associate Professor Orientation: Starting in fall 2011, the Provost’s Office has sponsored a one-day orientation for newly promoted and tenured associate professors. This orientation provides an opportunity for newly tenured and promoted faculty members to meet with senior university administrators to learn about and discuss university operations and programs that are generally of less immediate interest to pre-tenure faculty members. It also provides them an opportunity to form a sense of community as the most recent cohort of “permanent members of the Lehigh faculty” and to explore with each other potential areas of common research and/or teaching interests.

2.2.f. ID Policy Evaluation: The ad hoc committee charged with evaluating the policies, practices and culture that govern hiring also examined reappointment, tenure and promotion procedures that include ID dimension in the teaching and/or research and scholarly work. Two main recommendations in their report identified potential revisions to the Rules and Procedures of the Faculty, which governs the reappointment, tenure and promotion procedures at Lehigh, and are intended to provide greater focus and weight to faculty achievements of an ID nature. Provost Farrell forwarded these recommendations to the FPC for review. The FPC agreed to move these recommendations forward for consideration and adoption in spring 2013. Our SSR results support these actions: while women are no more attracted to ID work, they do have more practical concerns than men about institutional reward of ID and collaborative work.

Regarding fair and equitable university procedures, the means for the women dropped somewhat from the baseline (2011) to the progress survey (2012). The baseline and progress surveys on the value of ID and collaborative research issues revealed that the percentage of men and women are equal as to their perception that collaboration is valued, but the percentage agreeing increased from 2011 (83%) to 2012 (97%). More women agreed the institution values ID research in 2012 (90%) than in 2011 (86%).

2.2.g Leadership Development: In 2011, LU ADVANCE started a new Faculty Development Grant program to help move STEM faculty from discussion of ID collaboration and leadership in meetings and seminars to action that has an impact on STEM faculty careers. Funds can be used toward travel by Lehigh STEM faculty and visiting scholars to promote ID collaboration or for tuition and travel assistance for Lehigh women STEM faculty to attend professional leadership programs. To date, 10 grants have been awarded.

Early feedback to LU ADVANCE shifted the focus of originally proposed leadership development program for women faculty. The clear message in this feedback is that women STEM faculty at Lehigh do not equate the achievement of leadership with assuming a university administrative position. Rather, they subscribe to a broader interpretation of leadership that includes the attainment of prominence in research, scholarship, teaching and service within their professional disciplines. As a mid-course correction, the VPAD and DPFA were charged to initiate a program designed to accommodate this broader interpretation of leadership and to provide support and structure for engaging in networking opportunities external to the university for achieving such leadership aspirations. They have met with a group of recently tenured and promoted women associate professors from both STEM and non-STEM disciplines to explore how best this can be achieved. The objective is to modestly, but adequately, fund individual leadership development plans, structured in consultation with a senior faculty mentor. A two-year pilot program should be in place for implementation by the end of the current semester.

2.2.h Overall Evaluation of Retention and Career Advancement Initiatives: Retention and career advancement are by nature long-term goals. The evaluation of these initiatives with attention to individuals and ID matters is ongoing through multiple mechanisms described in section 4 below. As appropriate, statements of impact have been included with individual initiatives above; however, it is too early in the lifespan of many of these initiatives to measure improved retention and advancement.

Some progress may be observed through surveys and interviews with STEM faculty. Results suggest there are significantly lower mean responses by women compared to men in measures of job satisfaction and satisfaction with opportunities to collaborate in both 2011 and 2012. Additionally, there was more disagreement among women that women are well represented in senior leadership positions (this could possibly reflect the recent change from a female to a male dean of CAS as well as increased awareness). In 2012, almost 50% of the women faculty members said that LU ADVANCE had impacted them at least somewhat and described their experience in terms of opportunities to interact with other women and an improved environment generally. There was also the perception that interdisciplinarity is valued to a greater degree. Thirty percent of men wrote comments regarding improving the university environment by increasing the number of women STEM faculty and making them more visible.

3. Social Science Research

Our broad research goals include contributing to the knowledge base on gender and academic STEM careers and fine-tuning our interventions that will in turn be applicable to institutions similar in size and mission. We are investigating the possibility that women and men STEM faculty differ in attitudes toward and participation in ID and collaborative research, assessing the potential for ID and collaborative structures to facilitate recruitment of a critical mass of STEM women, determining whether participating in ID and collaborative structures improves satisfaction and reduces feelings of isolation, and examining whether existing programs of mentoring and evaluation (based on long-standing disciplinary and sole-investigator practices) need to be transformed to accommodate the realities of ID and collaborative work. While there is some scholarly evidence that women are more attracted to ID/collaborative research, the research has not examined this sufficiently across disciplines and by types of universities. Existing research also suggests that there are both opportunities and hazards associated with women's pursuit of ID and collaborative endeavors.

We conducted the survey of STEM faculty in 10 mid-sized private research universities, focusing on gendering of ID and collaborative research. Findings indicate few gender differences in disposition toward and participation in ID and collaborative work. Women are less satisfied with their overall opportunities to collaborate. Affiliating with a center/program does not lead to greater satisfaction and less isolation for women; however, women feel better about themselves as a member of their center or program than as a member of their department. A pattern of interaction effects between gender and division emerged. For example, women in engineering are particularly concerned about showing gaps in their knowledge to collaborators. Women in engineering also perceived the greatest amount of institutional impediments to ID research. At this point we are unable to tease out the extent to which gender effects can be attributed to the lack of a critical mass versus disciplinary cultures and practices.

The other two components of our research agenda are the bibliometric study and the ethnographic study. The bibliometric study addresses the limitations of self-reported data by using publicly available CVs and data from ISI to create a list of published journal articles to code for each faculty member. The data will be used to examine effects of gender, discipline, and center affiliation on research productivity indicators including collaborative and ID research. Because gendering happens at the level of meaning and not just in terms of gender differences, qualitative work is essential to helping us understand reported attitudes and behaviors. Among our challenges is the unraveling of the effects of token status from departmental and disciplinary culture and how gendered contexts and meanings may impact scholarly practices. Originally, this project was limited to Lehigh; however, we now plan to expand beyond Lehigh via Skype interviews.

Regarding dissemination, we present our findings internally and externally (NSF ADVANCE Workshops, Sociologists for Women in Society) and have submitted our first manuscript to *Sex Roles*. We are pursuing additional venues for dissemination.

4. Internal and External Evaluation

The goal of the internal evaluation is to provide LU ADVANCE with timely information regarding the aspects of the program that are successful and to advise them of the less successful aspects

so they can be reexamined and modified. Impacts and recommendations that are available thus far are described in the narrative of the initiatives above. Incorporating advice from Dr. Kelly Mack during our first site visit, the current evaluation plan has four major components.

1. Climate surveys. LU ADVANCE conducted a baseline survey in Year 1, a progress survey in Year 3, and will conduct a final survey in Year 5.
2. Intervention activity assessments. The internal evaluator conducts interviews with search committee chairs and deans, and administers activity-centered feedback forms.
3. Monitoring and collecting tool kit and other relevant institutional data. Data are being collected on recruiting, interviewing, hiring, tenure and promotion, and service on committees for the three years prior to the start of the grant and through the life of the grant.
4. External evaluation. Campus stakeholder interviews coincided with observation of the CITE program. The PI received the external evaluation report in December 2012.

All of the women faculty members who responded to the progress survey were aware of LU ADVANCE, as were 79% of the men. Of 47 women STEM faculty, 41 attended at least one of the measured 14 LU ADVANCE-sponsored activities. The six women who did not attend are from four departments with a larger percentage of women faculty (63%, 46%, 42% and 18%).

5. Sustainability Plan for LU ADVANCE Initiatives

We recognized at the outset of the LU ADVANCE project that sustaining the effort of the ADVANCE grant beyond the end date of the grant will be important because the interventions we are implementing will take some time (several years) to show results in terms of women STEM faculty demographics. Career development paths of faculty span many years and these initiatives will need to be sustained beyond the end of the NSF project to continue to increase and retain women faculty in STEM at Lehigh beyond the grant. At a minimum, sustainability requires continued focus, resources, and recognition of progress or lack thereof, all sufficiently culturally embedded so that continuation is not dependent on any single individual or external funding source. The challenge for creating sustainable practices is to make them a part of the cultural fabric such that the practices and underlying thinking are the “new normal.” One indicator often used is policy change; this may be a useful indicator, but in the world of academia practice change is often at least as powerful and persistent. Below we will briefly outline key sustainability elements of the major LU ADVANCE programs.

Recruitment: The process for review of candidate pools prior to selecting finalists for faculty positions had been rather casual. With the deans’ engagement and guided by the LU ADVANCE-developed Faculty Search Handbook, this aspect of faculty searches has become much more deliberate both at the department level and at the college level. Evaluation of candidates, a second important element of recruiting, is also now acknowledged as a nontrivial process that requires training and practice. Sustainability of these practices will result due to policy changes in the mechanics of the hiring process, and significant practice changes in terms of how searches are done, when they are done well, and what happens when they are not.

Retention and Career Advancement: As noted, most of these activities are campus-wide and many are supported by the Provost’s Office, given the value to the university of the success of our faculty. Support at the Provost level will continue beyond the grant period, and also gives a visible indicator of the institutional importance of the ID mentoring work. Our women faculty have clearly said they want to develop leadership skills, but not be “programmed” for only formal leadership positions. The development of the leadership portion of the LU ADVANCE program came from the Provost’s Office, led by the DPFA and the VPAD. While initially aimed at the LU ADVANCE target audience, we expect this will be deployed across the campus to all faculty looking to develop their leadership talent. Sustainability for this activity will lie in the success of the project, continued demand by faculty for this type of development opportunity, and the demonstration of how success in this area benefits the university.