



Mirroring and Modeling an External Award Process; Structuring a Career Development Grants Program for Women at a Striving University

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The *Connect* Grants were established in 2013 as part of an institutional transformation effort at a large private university to increase the faculty representation and career advancement of women in science, technology, engineering and mathematics. Funded by the National Science Foundation (NSF) ADVANCE Institutional Transformation (IT) program (award 1209115), the effort's goal is to remove barriers to resources that support career success and create new interventions and resources to facilitate success. The project [1] incorporates a multi-faceted strategic approach designed to enhance recruitment, retention and advancement opportunities for women faculty from diverse ethnic, social, and cultural backgrounds in science, technology, engineering, and mathematics (STEM) disciplines which include social and behavioral science (SBS). The program, called the AdvanceUniX project, combines research with programming and policy/practice enhancements to drive long-term changes that will transform University X's culture, promote innovation, and expand the representation of women on our faculty and among our campus leadership [2].

As part of the overarching AdvanceUniX project, the *Connect* Grants are designed to broaden opportunities for women faculty and enhance plans of work associated with tenure and promotion preparation and overall career advancement. The goal is to drive discovery and learning within an environment that supports the development of project proposals and the process of peer review. These mini-grants encourage leadership and career development, mentoring, networking and research collaboration, while enhancing and advancing the university's multifaceted initiatives and scholarship infrastructure. In support of the overarching institutional transformation project, successful grant proposals are also required to align with one or more of the AdvanceUniX project goals. In addition to directly supporting career advancement with funding, the grant design and structure also supports this effort. By modeling the grants after the NSF's process, faculty are presented with an opportunity to experience a competitive proposal and award process in preparation for future grant proposal writing and work.

This paper chronicles the *Connect* Grants since their inception in 2013, describing the rationale, the design and implementation and the evaluation process within the context of mirroring and modeling an external funding process, such as that of the NSF. Implications and considerations for moving forward are also discussed, with the overarching goal that this career building grant program may serve as a model for other universities striving for similar career advancement for women faculty.

Background and Rationale

University X is a "striving" university. O'Meara [3] defines this as "the pursuit of prestige within the academic hierarchy." At striving universities the expected research activity at tenure and promotion continues to increase. Thus faculty submit an increasing number of external funding proposals for grants, fellowships and awards. Reflecting University X's increased emphasis on research activities, in 2019 the university achieved the classification of "high research activity institution" or "R2" under the updated Carnegie Classification of Institutions of Higher Learning. In 2021, the university achieved a new record in terms of the cumulative value

and number of proposals submitted [4]. Wolf-Wendel and Ward [5] noted that the nature of a striving university can be especially marginalizing for women faculty, especially those in a parenting role, as research expectations rise while teaching demands remain high. The authors suggest that pressures are exacerbated for pre-tenured faculty as senior faculty have limited research and publication records due to the absence of an established research culture [5].

The *Connect* Grants [6] are offered through funding from the AdvanceUniX project and the Office of the Provost with advisory support from the university's Faculty Career Development Services, the Division of Diversity and Inclusion, and Sponsored Research Services. This program supports leadership and career development for all tenured and pre-tenured faculty at University X with a focus on women faculty.

Data Driven Rationale. The *Connect* Grants framework was informed by two faculty surveys and NSF Indicator Data. Results from the 2009 Faculty Career Satisfaction Survey created and administered as part of an NSF funded self-study project (NSF ADVANCE IT-Catalyst award 0811076 prior to the NSF IT award) identified career navigation as a barrier to the career advancement and leadership role progression of women STEM faculty [7]. Findings from the 2012-2013 Faculty Mentoring Survey administered by the University X Faculty Career Development unit suggested an opportunity for improvement by pairing faculty with mentors that encourage grant proposal submissions and encourage publication authorship [8,9]. NSF Indicator Data collected as part of an NSF funded self-study project demonstrated that women experienced a career barrier regarding time in rank at the associate professor level. This likely contributed to the downstream effect of low percentages of women in the full professor rank seen at the time of the IT award [10]. Together, these results provided strong motivation for offering grant opportunities that could pair faculty with mentors to drive career development forward at all ranks.

The Grants Proposal, Awarding and Reporting - Mirroring and Modeling an External Award Processes

The design and implementation of the *Connect* Grants was modeled after the National Science Foundation's grant proposal, awarding and reporting processes. This approach is intended to (1) provide the most equitable and fair process possible and (2) present faculty with an opportunity to experience a competitive proposal and award process at a local level. To this end, the *Connect* Grants process includes: (a) a Request for Proposals (RFP), (b) a mixed faculty and administrative review committee using detailed review criteria in the process, (c) required financial reporting, and (d) annual project reporting with evaluation and outcomes. A detailed communication plan supports the program and enables consistent messaging to the community. In addition, the AdvanceUniX project team also engages in evaluation of the overall *Connect* Grants program to understand the impact on women faculty and the University X community and to inform future refinements of the grant program.

***Connect* Grants RFP.** When the *Connect* Grants were initially offered in 2014, the RFP included an overview of the AdvanceUniX program as well as the data driven rationale (described above) for the grant program. Presenting the rationale was critical to promoting community awareness of the AdvanceUniX institutional transformation project across the

university. After several grant rounds and with broader understanding across the university of the issues being faced by women faculty (i.e. career barriers), the RFP has evolved to focus more on presenting an overview of the AdvanceUniX project as well as emphasizing special interest areas for the current grant cycle along with examples of past awards and successes. The RFP presents all of this along with the proposal template and supporting document requirements and a document outlining the review criteria.

In a similar fashion to NSF proposals, a detailed budget justification, biosketches for the proposer, letters of endorsement, project expectations, and an evaluation plan have been included as part of the RFP. Letters of endorsement demonstrate support for the project from the unit supervisor and also indicate that the project aligns with a faculty member's plan of work or research plan. Depending on the nature of a grant project, the endorsement letter may also indicate the potential impact of the project on the department, college and university. The project expectations emphasize the requirement that awardees will attend a Project Initiation Meeting (PIM), disseminate their findings and complete a final report summarizing activities and impacts. By aligning these aspects with the NSF award processes, proposers and awardees are presented with an opportunity for the full experience of a funded project in preparation for future opportunities. Further aligning with NSF processes, awardees are also requested to disseminate project outcomes and experiences by participating in university-wide workshops, panel discussions, and presentations as well as reporting project activities and impacts.

Mixed faculty and administrative review committee. Proposals are reviewed annually by a cross-divisional committee of faculty and administrators. Initially, invitations to serve on the committee came from the Provost. This lended credibility to the process with the administration directly demonstrating support. The committee reviews each proposal according to the transparent review criteria, discusses each proposal and ranks the proposals. In an effort to reduce implicit bias in the review process [11], a review template with well-defined criteria is used when reviewing all proposals. This template centers on the key proposal requirements, including: how the proposal aligns with the goals and objectives of the AdvanceUniX project, how the proposal addresses one of the special interest areas for the current award cycle, who will serve as a mentor for the project, a detailed project and evaluation plan, a statement of impact, the budget and the letters of endorsement. In an effort to stimulate a culture of faculty growth and success, the committee provided high-level summaries of strengths and weaknesses in the letters for proposals that were declined. There was also an offer extended to meet with those interested to discuss proposal review feedback. In later years, the letters included less written feedback and more encouragement to meet and discuss with review committee co-chairs. Many faculty followed through with this invitation for an informal discussion.

The *Connect* Grant program assembles the review committee strategically to add quality to the program, increase its visibility among the faculty and administration, and to promote administrative and faculty buy-in. Past awardees from the faculty and key administrators who have a vested interest in helping proposers expand their networks, either through recommending funding or through feedback offered to proposers who were not funded, are assembled and engaged to serve on the committee. Additional University X staff and faculty who are well acquainted with other funding sources on campus that could be helpful to proposers are also invited to join the committee. The review process emulates the NSF peer review process in

having established criteria that are visible to proposers, in the careful and unhurried deliberations made during the selection process, and in the detailed notes taken during deliberations which can be summarized and provided to proposers.

Required financial reporting. Grant proposals required the PI to complete a detailed budget table accompanied by a budget justification. Certain budget categories are allowable, often with noted exceptions, including student salaries, material costs, professional fees, travel, and professional development and training. An example of an exception within the student salary category is salary for Graduate Research Assistants (GRA). PIs can budget and spend funds for co-op positions and undergraduate/graduate student salaries. However, GRA salary requires prior approval from the program director. Expenses which are identified as not allowable include general office supplies, software, hospitality, entertainment, equipment, membership fees, faculty salaries, course waivers, and general operating expenses.

Near the grant start date, the offices of AdvanceUniX project, Sponsored Research Services, and the Provost hold a joint PIM for all new awardees and their respective financial support personnel, typically from their home department or college. In preparation for this annual meeting, a Terms & Conditions document was created and refined each year, listing all grant-related logistical details, including reporting requirements.

Grant awardees are required to submit monthly financial reports to the AdvanceUniX project which includes the project Oracle statement, account analysis, payroll distribution report and corresponding time cards (if applicable), and statement certification. For months with no financial activity, the PI is only required to sign the statement certification indicating that no financial activity had occurred. The financial accounting required by the PI aligns with the process used at the university for grants that receive NSF funding. Within our striving university, it became apparent that many of the *Connect* Grant awardees - especially those from non-STEM disciplines - had not obtained external, federal funding in the past and having the opportunity to perform these monthly exercises was informative and in some cases, helped to build financial acumen of the PIs and for the financial personnel within their home departments.

Annual project reporting. In addition to financial reporting requirements, grant awardees are required to complete a final report and evaluation within 30 days of the end of the grant period summarizing activities and impacts. During the PIM, grantees are informed that elements reported in the final report (with unique identifiers removed) may be disseminated through the AdvanceUniX project website and other reporting needs. The grant PI is responsible to include copies within the final report of all publications (including websites) of any material based on or developed under this funded project. These publications also required acknowledgment of NSF support and a disclaimer, as per the NSF requirements. The annual project reporting required by the *Connect* Grant PI aligns with the process required by NSF under an active award.

Communication plan. The communication plan was initially structured to increase awareness of the *Connect* Grant program, to help build administrative and faculty buy-in and to add a sense of quality regarding the program. Multiple scheduled emails announcing the program were sent to the entire university community from the Provost. Reminder emails from the AdvanceUniX project leadership team about the program and the deadlines were sent to specific campus groups

including all women faculty, deans and department heads. The communication plan also included an invitation from the Provost to serve on the review committee and award notifications once decisions were made that were copied to the Provost and the deans. With the program established as an institutional office, and with the onset of the pandemic necessitating the streamlining of communications from the Office of the Provost, most communications regarding the *Connect* Grants now originate from the AdvanceRIT office. Again, this process aligns with aspects of NSF award processes where leadership publicly supports funding opportunities and leadership is made aware of awardees' accomplishments.

Outcomes/Results/Evaluation. Twenty-three submissions were made to the *Connect* Grant program in the initial offering and a cross-university, mixed gender, faculty selection committee reviewed the submissions and recommended funding. Eight rounds of the *Connect* Grants effort have been administered since 2014, with a total of 141 proposals submitted. Women faculty led 91% of the submitted proposals; 49% were led by Assistant Professors, 33% by Associate Professors, and 16% by full Professors. Requested funds ranged from \$1,920 to \$40,000.

From 2014 to 2020, 72 *Connect* grants were awarded, representing a funding rate of 51%. Awarded projects were led almost exclusively by women and 46% were led by Assistant Professors. Grants have varied in size from \$1,000 to \$13,500, with a total disbursement of \$396,311 since the inception of the *Connect* Grants program.

While the framework is clearly a top-down approach with university-level administration and AdvanceUniX project leadership team support to advancing women faculty, a number of the projects themselves provide an opportunity for organic and bottom-up approaches toward reaching the AdvanceUniX project goals. These organic approaches stem from faculty who were motivated to enact change on campus. Twenty-six of the awarded projects were aimed at groups of faculty within the institution, with targeted career outcomes from enhancing networks, skills, and visibility, to organization building, organizational development, and leadership development [12].

Aligning with the 26 awarded projects targeting career outcomes, women faculty reported positive impacts as a result of their work. During interviews with the project internal evaluator, awardees described advancements in their research that resulted in journal publications, grant proposals, presentations, portfolio development, book chapters, professional network development and collaborations and joint research projects. For example, one awardee reported that as a result of their *Connect* Grant project, they organized three electrical engineering professional development seminars and participated in five national conferences which increased the representation of their research and scholarly work. In fact, they were invited back to several universities to talk further about their research and extend their collaborations with other faculty members. While not the focus of this paper, the multifaceted impacts of the *Connect* Grants Program are overwhelmingly positive [12].

Discussion and Conclusion

Emulating the NSF award processes for an internal grant program presents an opportunity for faculty to develop the skills necessary for securing external funding, and to do so in a “safe” and

supportive environment. Such a program is a “2 for 1” - providing faculty with the opportunity to build grant proposal writing and management skills as well as providing funding for individual domain-oriented research projects. A unique feature of this program is that many *Connect* grants provided support for initiatives to improve campus culture. As noted above, targeted project outcomes included enhancing networks, skills visibility and organizational and leadership development and overwhelmingly supported women faculty.

The strong structure of the program, including the RFP, awarding process, communication plan and reporting add to the credibility of the program and awareness across campus while also presenting faculty with an opportunity to experience a competitive proposal and award process in a safe environment. Structuring the RFP in a way that mirrors NSF award processes of including a biosketch, requiring a budget justification, an evaluation plan and a dissemination plan, aid faculty in preparing these pieces for future grant proposals. Transparency around the awarding process, including the evaluation rubric, presents clarity to the university community as to the expectations for the proposals. An intentional and structured grant administration around project finances and progress also supports faculty in conducting the work of the grant while at the same time preparing them for future external awards. The detailed and intentional communication plan presents an opportunity for the administration to provide support for the AdvanceUniX project as well as for a structure that mirrors an NSF funding process. At the same time, the communication plan raises the administration’s awareness about the overall AdvanceUniX project as well as the work of the awardees. The required project reporting and financial accountability from the *Connect* grant PIs adds further accountability and justification for award funding.

All of this can be particularly beneficial in an environment like University X, where the administration and faculty are striving to build a more robust research agenda with a still evolving grant support infrastructure. With 91% of the proposals led by women faculty and nearly half of those faculty at the assistant professor rank, the *Connect* Grants provide an opportunity for faculty at a striving university where there potentially exists a void in research experience and mentoring, and as noted by Wolf-Wendel and Ward, can particularly affect women faculty [5,12]. The *Connect* Grants clearly benefited all faculty who engaged in the process, whether it be as an awardee, a declined proposer, a grant team member or a reviewer. Less obvious are the benefits to the University when building the foundation of a striving university. In particular, through modeling a NSF-like RFP structure, the effort’s communications approach, and the awarding and reporting processes that faculty must understand and navigate, a structured grant proposal process enables faculty to experience and prepare for external funding proposals and awards. Thus, the *Connect* Grants program components mirror and model external funding procedures legitimizing the university’s efforts in a changing research landscape. This approach also serves as a model for other universities who may be striving, with increasing scholarship and funding aspirations, and that may be seeking to advance women faculty.

A follow-up paper is under development that explores how *Connect* Grants support both technical and non-technical grants with prestige and recognition on our campus. This could lead to a sense of value and inclusion and satisfaction by faculty at the university, especially those who were awarded funding or are closely aligned with the project. Of particular interest is the

consideration regarding the value that the grants have for individual faculty rather than solely focusing on the value that faculty bring to the University through their funded work.

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