

Board 333A: Lessons Learned from a Capacity-Building Workshop for Two-Year Colleges Seeking U.S. National Science Foundation Funding

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Abstract

The Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program, managed by the U.S. National Science Foundation (NSF), provides grants to institutions of higher education to disburse scholarships for low-income, high-achieving domestic students enrolled in a STEM major. Despite the crucial role that two-year colleges (2YCs) epitomize in providing open-access affordable education to a diverse student population, the majority of NSF S-STEM scholarships are awarded to four-year institutions, which tend to have specialized personnel working on the preparation and submission of proposals.

In this paper, we report a summary of the activities and evaluation of a "Capacity Building Workshops for Competitive S-STEM Proposals from Two-Year Colleges in the Western U.S.", funded by the NSF S-STEM program, aiming to facilitate submissions to the NSF S-STEM program from two-year colleges (2YCs). The workshop was offered in 2019 (in person) and in 2020 and 2021 (virtual), initially to support 2YCs in the Western region of the US and was expanded nationwide in 2020. During participation in the two-day workshop, several aspects of proposal submission were reviewed, in particular, the two NSF Merit Review Criteria of Intellectual Merit and Broader Impacts. Pre- and post- workshop support was also available via virtual office hours and webinars that addressed specific elements required to be included in S-STEM proposals. The evaluation of the workshop has been performed via post-workshop survey administered through Qualtrics™. A journal paper reporting on the evaluation of all three offerings of the workshop has been submitted and currently in review.

In this paper, we intend to reflect on the successful features of this workshop series and the lessons learned throughout the three offerings. Over three years, 2019, 2020 and 2021, the program supported 103 participants on 51 teams from 2YCs. The program assisted at least 31 2YCs submit their S-STEM proposals to NSF, and 12 of these 2YCs received S-STEM grants. An additional 2YC proposal was first recommended for an award, but the proposal was subsequently declined for reasons unconnected to the content of proposal itself. The 3-year funding rate is 39%; if the above-mentioned proposal that received an award recommendation but was then declined is taken into account, the award rate is 42%.

Description of the Main Activities

The NSF S-STEM program awards grants to institutions of higher education to disburse scholarships to high-achieving, low-income domestic students enrolled in STEM majors, in addition to providing funds to support evidence-based curricular and co-curricular student success strategies. The institutions receiving the award oversee the funds distribution to these eligible students. The majority of the S-STEM awards goes to 4-year institutions, that often have dedicated personnel to work on proposal submissions; indeed, according to the NSF public data, since 2006 associate's-granting institutions account for only 15% of the S-STEM awards and this seems disproportionate with respect to the number of low-income STEM undergraduates in 2YCs [1]. The "Capacity Building Workshops for Competitive S-STEM Proposals from Two-Year Colleges in the Western U.S." goal has been to support preparation and submission of proposals to the NSF S-STEM program from two-year colleges (2YCs).

The workshop has been offered during the summers of 2019 (in person), 2020 and 2021 (virtual) and focused on several aspects of proposal preparation, including addressing the NSF Merit Review Criteria, developing, and justifying proposed budgets, incorporating appropriate and meaningful evidence-based strategies, and evaluation and dissemination plans. A complete description and evaluation analysis of this project is currently being submitted for publication [2]. The workshop facilitators who were carefully selected among individuals with experience as rotating NSF officers and familiarity with the S-STEM program. Each 2YC team was composed of two team members, usually a faculty who served as PI and an administrator. Prior to the workshop, each team was asked to complete tasks related to gathering various data associated with students, which proved to be challenging for many of the attending teams. Pre- and post-workshop support was also extensively offered via virtual office hours and webinars. The topics

of the webinars were selected based on the organizers' experiences reviewing (serving on review panels) and processing S-STEM proposals (while NSF POs).

Evaluation

Overall, the workshop was well-received, and participants reported satisfaction with the content and the structure of the workshop. The main challenge that nearly all participants experienced was associated with gathering students' data. This is not surprising since 2YCs often don't have a dedicated grants office, and proposal preparation is often done by faculty. The main purpose of the pre-workshop activities was to support 2YC faculty in this challenging task while also developing knowledge that could be applied to future proposal-preparation opportunities. To better address the needs of 2YCs, the teams from the 2YC could be improved by including an administrator from the Institutional Research office (or similar campus entity), in addition to a STEM faculty member and STEM administrator.

Participants also made suggestions to improve the workshop's content, including adding material related to strategies, objectives, budget, and evaluation plans and providing more examples of awarded and declined proposals submitted by 2YCs. Attendees also reiterated the importance of post-workshop "coaching".

Lastly, although a question regarding a comparison between the in-person and the virtual formats was not directly posed, an increasing trend in the statement "I had opportunities to interact with the presenters during the workshop" from 2019 (in person) to 2020 and 2021 (virtual) may suggest that the virtual setting offered more opportunities to interact with the presenters and smaller groups.

Final Considerations

Cumulatively, this program supported 103 participants on 51 teams from 2YCs and assisted at least 31 2YCs to submit their S-STEM proposals to NSF S-STEM (we used "at least" due to uncertainties from few colleges whose status we were not able to update). This is no small accomplishment, especially in consideration of the challenges faced by society during this timeframe.

S-STEM grants were awarded to 12 of these 2YCs, which most likely wouldn't have awarded without the support of this workshop, especially in these recent times of a global pandemic. An additional 2YC proposal was first recommended for an award, but was subsequently declined due to reasons not associated with the quality of the proposal. The 3-year funding rate is 39%; if the proposal mentioned above that was recommended for an award then declined is taken into account, then the award rate becomes 42%. This is well above NSF's typical 22% proposal success rate for the Division of Undergraduate Education (DUE) (where S-STEM is managed) [3].

Several participants from earlier workshops whose proposals were declined, revised and submitted proposals to later competitions. While their own grit and determination played a major role, it could be plausible to think the support and encouragement received through the workshop may have also been a factor.

There are additional considerations regarding the benefits of this program that are notable, regardless of funding outcome. Thanks to the participation in the workshop, 51 institutions were exposed to the broader aspects of preparing competitive NSF grant proposals. The skills and the knowledge acquired through the process of proposal preparation could certainly be applied to future NSF grant applications to programs other than S-STEM. Additionally, institutions gained

awareness and familiarity with evidence-based supports for STEM students. These are central aspects of knowledge generation and capacity building.

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