Board 430: Wok in Progress: Enhancing the Use of Institutional Data in S-STEM Proposals: Capacity-Building Workshops

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Motivation and Project Overview

A series of workshops were developed and offered to build capacity for project teams to gather and fully use institutional data as they develop their S-STEM proposals. The NSF S-STEM solicitation includes a requirement that the project description "analyze institutional data … to determine the potential number of eligible Scholars." While faculty often are passionate about recruiting and supporting engineering degree attainment for academically talented, low-income scholars with unmet financial need, some might not be certain of how institutional data can inform and strengthen their project development. Additionally, faculty PIs often have limited interaction with their institution's Institutional Research (IR) and Financial Aid offices. The logistics and communications of requesting and obtaining the necessary student data can be a challenge and source of frustration for faculty, both novice PIs and those with S-STEM experience. Faculty PIs might not be sure how to communicate their request for the necessary data or might encounter challenges in getting the data. For example, faculty members and IR administrative staff may use different language and definitions of student data, leading to delays. Similarly, the IRB considerations related to under- graduate and graduate student data can add another layer of unfamiliarity and complexity for PIs.

Thus, a virtual workshop series was developed and implemented to help address challenges from both project development and practical perspectives, with the goal of enhancing participants' ability to effectively use institutional data in their S-STEM proposals and other efforts with similar goals. The project goal is to enhance the capacity in faculty PIs' use of institutional data in support of their S-STEM proposals. In particular, the project seeks to increase faculty PI's knowledge of and confidence in using data to better understand their institution's STEM enrollment, retention, and graduation landscape for low-income students with academic potential and ability. Thus, the project objectives are to:

1) develop and implement a virtual workshop series focused on the institutional student data components of an S-STEM proposal;
2) recruit diverse S-STEM teams who plan to submit an S-STEM proposal to two offerings/ cohorts of the workshop series;
3) increase participants' knowledge of and confidence in using institutional student data to inform strategies to recruit and support academically talented, low-income students with unmet financial need; and
4) evaluate the overall project to identify the needs of the participants in using institutional data and to inform improvements in faculty development workshops.

For the workshop participants, the outcomes include a) articulating awareness of how institutional data can be used to inform their project plans and S-STEM program goals; b) developing a plan for using student data in project development, including identifying relevant questions that the student data can help answer and with a focus on the latest S-STEM solicitation requirements; and c) drafting a plan for requesting student data from their Institutional Research and Financial Aid offices including IRB considerations.

Workshop Development and Implementation

The workshops were developed using systems thinking and evidence-based approaches to build capacity in the participants' recognition of the value of data to their S-STEM project goals and increase their confidence to gather and use student data. The three-part workshop and participant hour sessions incorporated inquiry, reflection, hands-on activities, and practical strategies to both meet the S-STEM project description requirements and strengthen the proposal development process. To help participants meet workshop outcomes, three workshop sessions provided information and opportunities for individual thinking and small group discussions. Example data tables for the potential pool of scholars, with enrollment, average GPA, and unmet need, were part of the discussion exercises. The workshop agenda also included panel discussion from the workshop facilitators, who are current S-STEM PIs and former NSF program officers with experience in the S-STEM program. A workbook to facilitate the virtual activities during the workshops and as homework for project teams also was developed as served as a guide. The workshop materials (slides and workbook) from Cohort 2 are available at https://bit.ly/SSTEM-data-slides-2023 [1].

The workshop was designed using an approach that integrates systems thinking, inquiry, reflection, and practical strategies to enhance participants' capacity to improve their understanding of the value of the institutional data and confidence to gather and use the student data. Evidence- based strategies will be incorporated to help participants enhance their knowledge, skills, and confidence, aligning with the intended participant outcomes. Starting with inquiry (e.g., questions and "I wonders" related to student enrollment, retention, and success), the workshop sessions and activities will guide participants to connect their questions and prior knowledge with relevant undergraduate and graduate student data. The workshop plan strategically scaffolds their knowledge and skills to help build and strengthen knowledge connections, recognizing that novice learners (participants) might have incomplete knowledge frameworks and could benefit from facilitation to apply their prior knowledge and experiences on student recruitment and success to their S-STEM proposal plans [2, 3]. Additionally, the workshop activities were developed using the Transparency in Learning and Teaching (TILT) framework [4] and foster an inclusive and equity-focused learning environment [5].

Preliminary Workshop Results

The objective to recruit diverse faculty and project teams from diverse institution types, especially those with limited NSF S-STEM experience was satisfied. Two cohorts of participants were recruited to the workshop series, providing opportunities to learn about the strengths and concerns of S-STEM project teams and their institutional offices as they develop their S-STEM proposals. Cohort 1 was recruited in November-December 2021, with workshops held virtually during January-February 2022. Cohort 2 was recruited in November-December 2022, with workshops held virtually during December 2022-February 2023.

A total of 114 participants from diverse backgrounds and institution types were recruited to two workshop cohorts (winter 2022 and 2023), including faculty and administrators with limited or no S-STEM experience. Participants were encouraged participate in pairs, such as a faculty PI and co-PI or staff from their Institutional Research or Sponsored Projects office. Cohort 1 included 17 out of 41 participants who were preparing their first S-STEM proposal; in Cohort 2, this was 42 out of 73 participants.

In Cohort 1, the 41 participants were affiliated with 24 different institutions, with 11 from two-year colleges, 16 from Primarily Undergraduate Institutions (PUIs), 5 from Masters-level institutions, 9 from doctoral institutions, and 10 from HBCUs or MSIs. In Cohort 2, the 73 participants were affiliated with 40 different institutions with a variety of institution types: 5 from two-year colleges, 40 from Primarily Undergraduate Institutions (PUIs), 8 from Masters-level institutions, 22 from doctoral institutions, and 6 from HBCUs or MSIs.

Many of the participants had limited experience working with their Institutional Research (IR) and Financial Offices, which are critical interactions in S-STEM proposal development and project implementation. In Cohorts 1 and 2, 48% and 53%, respectively, of participants had no or little experience interacting with their IR office. Even more had no or little experience interacting with their Financial Aid office: 61% in Cohort 1 and 76% in Cohort 2.

Evaluation data indicates that the workshops will enhance the ability and confidence of the participants and their institutions to develop data-informed projects. The evaluation results from the Cohort 1 and 2 workshops indicate that 70% (n=20) and 68% (n=24), respectively, of participants rated "To a great extent" or "To a very great extent" in response to "To what extent do you feel the knowledge and skills gained in the workshop have contributed to the development of a strong S-STEM proposal product" and 60% and 55%, respectively, "To a great extent" or "To a very great extent" in response to "To what extent will you be able to transfer the knowledge and skills gained in the workshop to other uses beyond the S-STEM proposal".

This empowerment not only benefits participants' S-STEM proposals but also strengthen related efforts that seek to identify low-income STEM students with academic ability and potential and to support them to degree attainment.

References

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