

STEM Servingness at Hispanic Serving Institutions

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Background

The number of higher education institutions earning the designation of Hispanic Serving Institution (HSI) has more than doubled between 2005 and 2018, and accounts for nearly 17% of all non-profit, degree granting institutions. In 2017, in response to two Congressional Acts, the National Science Foundation (NSF) funded a total of 11 national conferences to inform the design of their new HSI Program. The University of Arizona, one of first conference awardees, held a working conference that brought together over 100 faculty, students, and administrators from 42 Southwestern higher-education institutions, including 37 HSIs and five emerging HSIs, to identify gaps, opportunities, and key recommendations for transforming STEM education at HSIs. Following the conference, the STEM in HSI Working Group at the University of Arizona was formed to spearhead broader impacts informed by the conference recommendations [1] and anchored in the notion of “servingness” at HSIs [2]. This paper presents the work tied to and the products resulting from the 2017 conference project thus far, framed from a perspective of promoting “servingness” at HSIs.

Theoretical Framework

The conference project, the resulting consensus report, and our ongoing work within the STEM in HSI Working Group are motivated by critical, social justice, and organizational theories [3]–[5]. Specifically, our recommendations are grounded in a “Hispanic-serving” (or “Latinx-serving” or “Raza-serving”) organizational identity framework that calls for enacting a culture of promoting equitable outcomes as well as development of racial/cultural and professional identities for Hispanic students [2], [6]. This framework encompasses an emerging typology of HSIs [2], that challenges such institutions to realize the latent intentionality behind their designation and move from merely *enrolling* Hispanic students, to *graduating* them in proportional numbers, while also constructing an organizational culture that *enhances* their potential, thereby achieving “*servingness*”. Written with this “servingness” framework in mind, our recommendations are structured such that they may be of guidance to all HSIs and emerging HSIs, regardless of their current organizational culture realities.

Methods

The three-day conference was structured into five tracks: (1) enabling transitions from 2- to 4-year HSIs, (2) charting the role of Research 1 (R1) HSIs in undergraduate STEM education, (3) innovative pedagogies and curricula, (4) mapping HSI opportunities and challenges to recruitment, retention, and persistence, and (5) the meaning and role of culturally responsive STEM education at the college level. During the first two days of the conference, participants in each track (comprising faculty, students, and administrators from a wide range of STEM fields and Southwestern states) engaged in a series of guided discussion sessions focused on needs/gaps, challenges/barriers, successes and lessons learned, student support systems, faculty

development, and opportunities relevant to the theme of the conference. All discussions were moderated using a predefined set of prompt questions and meticulously documented by trained scribes. In addition to the guided discussion sessions, both days included student panels and debriefing from each track. The third day of the conference was dedicated to synthesis and development of track-specific summaries, led by a subset of moderators and participants from each track.

Data sources for our consensus report included pre- and post-conference surveys, more than 350 pages of detailed scribe notes, student panels, moderator, and track summaries. Anonymous inputs from conference participants were collected on paper and online. Members of the conference leadership team, both independently and collectively, reviewed and analyzed the data. Regular meetings were held among members of the conference leadership team to discuss emerging themes and reach consensus on recommendations.

Results

Six major themes, encompassing 13 critical focus areas and a total of 28 recommendations emerged from our analyses of the conference transcripts (see Table 1). Each focus area includes one or more sets of recommendations related to critical gaps and opportunities at HSIs and emerging HSIs. Detailed description of recommendations can be found in the consensus report [1]. Each recommendation follows a general template, starting with rationale derived from conference participant inputs, then describing areas where efforts and changes are needed, and ending with considerations for competitive proposals on HSI initiatives relevant to that recommendation.

Table 1. Summary of themes and critical focus areas relevant to HSIs

<p><i>Advising, Mentoring, and Non-Academic Support Systems</i></p> <ol style="list-style-type: none"> 1. Advising and mentoring systems are haphazard in focus and goals, and lack alignment with student needs. 2. Non-academic support systems focused on family and community are key for equitable STEM success, yet severely underdeveloped <p><i>STEM Academic Structure and Related Support Systems</i></p> <ol style="list-style-type: none"> 3. Structure and availability of top-tier STEM curricular offerings are inequitably designed for the success of non-traditional students 4. Academic support systems focused on STEM rigor and math readiness are not sufficient to support underrepresented minorities (URMs) and non-traditional students <p><i>Evidence Based Pedagogies</i></p> <ol style="list-style-type: none"> 5. Evidence Based Pedagogies (EBPs), known to improve STEM achievement for diverse learners, are unevenly practiced across institutions 6. Where diverse EBPs are deployed in good numbers, scalability is behind
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Equity, Diversity, and Culturally Responsive Practices

7. Culturally Responsive Practices (CRPs), known to enable and sustain academic interest and access for the students HSIs aim to serve, are inconsistently understood and practiced at HSIs
8. Where some CRPs exist, they are often non-STEM specific
9. CRPs are commonly viewed as tangential to the core academic mission

Research Experiences and High Impact Practices

10. High Impact Practices (HIPs) at HSIs are culturally isolated and not sufficiently inclusive
11. Resources at Research 1 (R1) HSIs are mostly inward-facing and not purposefully shared among co-located institutions and communities

Serving Hispanic Students at HSIs

12. Extramurally funded STEM programs are underutilized by the students HSIs seek to serve
13. Retention, persistence, and success are core charges of HSIs and their faculties, not just student responsibilities

Outcomes

Findings from this project, comprising the consensus report and other broader impact initiatives built upon it, are primarily meant to inform the ongoing development of NSF's HSI program, in addition to paving ways to new and stronger cross-institutional synergies and other partnerships in the Southwestern U.S. Specifically, the conference has led to the formation of the STEM in HSI working group at the University of Arizona to engage with academic and non-academic units, as well as faculty at other southwestern HSIs and initiate collaborative work that raises institutional awareness of what it means to serve STEM undergraduate students at new and emerging HSIs. For example, in 2018, the STEM in HSI Working Group partnered with three competitively selected teams at Southwestern HSIs to develop adaptive case studies aiming to mobilize institutional change aligned with one of three critical topics at the intersection of STEM and equity: (1) access, focused on part-time student transitions, (2) identity, focused on community-based research projects, and (3) assessment, focused on novel and inclusive metrics.

Conclusion

Given that the "servingness" and institutional transformation framework guided the design of the conference and the structure of our report, these recommendations are holistic in nature, considering both internal and external characteristics of HSIs as well as cutting across student, staff, faculty, and institutional aspects. In particular, our recommendations were developed with the purpose and mission of HSIs in mind [7], which may be different from other higher education institutions. Nonetheless, the recommendations for serving Hispanic students at HSIs may be leveraged to inform serving Hispanic and other students with diverse, non-traditional, and historically minoritized backgrounds at other higher education institutions, especially when

considered with attention to an institution's organizational and regional culture. In particular, our recommendations are meant to be illustrative rather than prescriptive. Fundamentally, they are meant to enhance discussions and change regarding improved "servingness" in the context of themes and focus areas of particular relevance to each unique HSI, and tied to factors including Hispanic student outcomes, HSI size, location and mission, needs of surrounding community, and other institutional strengths and values.

References:

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