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BOARD #168: WIP: Exploring How Mentoring Influences Sense of Belonging Among First-Year Women Engineering Faculty

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Introduction

The underrepresentation of women in engineering academia continues to be a significant challenge, specifically for first-year women faculty navigating a male-dominated field while establishing their professional identity [1]. Many women faculty in engineering often experience barriers such as isolation, implicit bias, and an overall lack of institutional support, drastically impacting their sense of belonging in academia which may hinder their career advancement [1]. Additionally, the transition into faculty positions is a crucial period where access to resources, networks, and mentorship can make a substantial difference. Unfortunately, many first-year women engineering faculty often lack adequate mentorship, which further intensifies their feelings of exclusion and marginalization [2].

Mentorship in academia has been widely recognized as a key factor in addressing these challenges, particularly for underrepresented communities in higher education [3]. Offering and supporting professional development, providing guidance, and creating and maintaining support networks, mentorship can be a tool to mitigate the systemic and interpersonal barriers faced by women faculty [4]. Furthermore, mentorship programmatic initiatives tailored to the unique experiences of women faculty in engineering can support a stronger sense of belonging, which is necessary for long-term career success and overall faculty retention [4].

This study aims to explore the impact of mentoring on the sense of belonging among first-year women engineering faculty, drawing on Strayhorn's Sense of Belonging Framework. Strayhorn's framework highlights the significance of an individual feeling valued, accepted, and included in a community as a necessity for professional and personal growth [5]. By understanding how mentorship influences these areas, this research seeks to understand the action through which mentoring practices foster belonging and improve the experiences and outcomes of women faculty in engineering.

This study provides significant implications for advancing diversity, equity, and inclusion in STEM academia, especially within faculty development. It is important to address the specific needs of first-year women engineering faculty because it commits to ongoing efforts towards a more inclusive academic environment. In addition, this study can inform institutional policies and practices, addressing the value of structured and intentional mentoring initiatives as a strategy for supporting underrepresented communities in academia. This paper outlines the design and early implementation of a faculty workshop series targeted towards first-year women engineering faculty.

Current Literature

Mentorship and Faculty Development

The practice and craft of mentorship play a pivotal role in the professional development and job satisfaction of faculty, particularly those navigating the challenges of underrepresentation in STEM academic departments [6]. Effective mentorship positively impacts career progression, job satisfaction, and professional identity [7]. Within engineering academia, mentoring practices are also an opportunity to address systemic barriers that may hinder the recruitment and retention of women faculty [4]. Research demonstrates that mentorship enhances supportive work environments and faculty engagement within departments, also leading to less turnover intentions [6].

Sense of Belonging in Academia

Strayhorn's Sense of Belonging Framework defines belonging as the degree to which an individual feels valued, accepted, and included in a specific community [5]. For women faculty in engineering, a strong sense of belonging is crucial for overcoming feelings of isolation and experiencing environments often characterized by implicit bias and gender-based disparities [2]. Strayhorn's framework emphasizes key components, for example, meaningful relationships, shared values, and perceived support as necessities for fostering belonging [5]. When applied to academia, specifically underrepresented faculty in engineering, this framework highlights the importance of inclusive practices and mentorship in cultivating environments where underrepresented communities can thrive.

Methods

Workshop Design and Objectives

This study includes a faculty development workshop series as the primary intervention. The workshops are designed to address the unique challenges faced by first-year women engineering faculty and to further explore how mentorship can enhance their sense of belonging in academia. Additionally, the study assesses the impact of these workshops on participants' awareness of mentorship benefits and their retention within engineering academia. The series integrates a combination of group mentorship activities, guided discussions, and reflective exercises to foster meaningful engagement and collaboration among participants.

The primary objectives of the workshop series are:

1. To facilitate open discussions about mentoring experiences and their impact on professional identity.
2. To collaboratively develop practices and strategies that promote belonging within engineering academic departments.
3. To assess the influence of the workshop series on participants' sense of belonging, awareness of mentorship resources, and retention in academia.

Research Methods and Data Collection

To evaluate the effectiveness of the workshops, this study employs a mixed-methods approach, combining both quantitative and qualitative research methods.

The quantitative methods include:

1. A pre-and-post workshop survey is administered to participants to assess changes in their sense of belonging, awareness of mentoring strategies, and perceptions of institutional support.
2. The survey includes Likert-scale questions measuring participants' comfort in seeking mentorship, confidence in navigating their faculty roles, and knowledge of available resources.

The qualitative methods include:

1. Semi-structured interviews with selected participants capture in-depth insights into their experiences and perceptions of the workshop series.
2. Focus groups are conducted to facilitate discussion on how mentoring has influenced their professional development and sense of belonging.
3. Open-ended survey questions allow participants to share reflections on the workshop's impact.

Evaluation and Impact Assessment

The study evaluates workshop effectiveness based on participant responses and engagement levels. Data from the pre-and-post surveys are analyzed to identify trends in belonging, awareness, and perceived retention. Thematic analysis of qualitative responses helps uncover key themes related to mentorship support and professional identity development.

Workshop Implementation Status

The workshop series has not been implemented yet. The design phase is currently underway, with plans for initial sessions to be launched in the near future. Data collection will commence once the workshops are conducted, and findings will be analyzed to assess their impact on faculty belonging, awareness, and retention. This study aims to provide actionable recommendations for faculty mentoring initiatives, contributing to the broader effort to enhance diversity, equity, and inclusion within engineering academia.

Expected Outcomes and Discussion

Expected Outcomes

This study anticipates several key outcomes that contribute to understanding the mentoring and sense of belonging relationship for women engineering faculty. First, the workshop series is expected to raise awareness of how mentorship impacts the professional and personal experiences of first-year women engineering faculty. Insights and learned experiences from this research will provide recommendations and actionable practices for fostering supportive

engineering academic departmental and institutional environments. Moreover, the findings intend to identify specific mentoring practices that are most effective in enhancing a sense of belonging among underrepresented faculty in engineering academia.

Implications for Institutions

The results of this study hold significant implications for institutions seeking to advance diversity, equity, and inclusion in engineering academia. Strategies obtained from the findings can inform the design and implementation of faculty mentoring programs that impact belonging and inclusion within departments. By integrating these strategies, institutions can effectively support the recruitment, retention, and overall career development of women in engineering academia. Overall, this research highlights the broader impact of intentional mentoring toward creating more equitable and inclusive academic spaces, ultimately advancing DEI initiatives in engineering academia.

Conclusion

Summary of Key Insights

This study emphasizes the important role of mentorship in fostering a sense of belonging for first-year women engineering faculty. By understanding the unique challenges faced by this community, mentorship can help create more inclusive and supportive academic spaces. Tailored mentoring practices, grounded in frameworks like Strayhorn's Sense of Belonging, are key to addressing the systemic barriers that affect the success and retention of women in engineering academia.

Future Work

Further work should focus on scaling the workshop model to include a broader range of faculty communities and demographics, establishing that diverse perspectives and experiences are highlighted. Additionally, longitudinal studies are critical to unpack the long-term outcomes of mentoring programs, specifically, their effect on career advancement and retention for underrepresented faculty in engineering fields. By investing in structured and intentional faculty mentoring programs, academic institutions can enhance their diversity, equity, and inclusion goals while fostering a culture of belonging and support for all faculty communities.

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