Female Retention in Engineering: A Qualitative Study

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Abstract: Women remain underrepresented in college engineering programs despite national policy efforts to provide equal opportunity in education. The lack of gender diversity in higher education is a primary concern for researchers and administrators because it has a direct impact on student learning and the potential for advancement in research and innovation in the academy. Research indicates that learning communities that value and celebrate gender diversity correlate with enhanced research productivity, creativity, and innovation. Higher education institutions that intentionally address this gap will enhance their capacity to advance student learning outcomes and faculty research competiveness. I explore the personal narratives of two female students who have persisted in engineering and two female students who have left engineering and chosen a different degree program at the university where I work. The goal in exploring these narratives is to gain insight to the reasons why women persist in engineering and why they leave. The results of this qualitative study show that women continue to experience social injustice in both subtle and more obvious encounters in the academic environment. Some of the factors explored in this study had a negative impact on women, while others have served as more positive experiences. The findings from this study highlight the importance of creating a culture that is inclusive and one that also offers students the opportunity to apply their knowledge and skills through outreach, engagement, and research.

EXTENDED ABSTRACT

STATEMENT OF THE PROBLEM

Women remain underrepresented in academic disciplines including, science, technology, engineering, and math (STEM), and in leadership positions. Despite policy efforts like Affirmative Action and Title IX, both of which aimed to provide equal opportunity in education, gender inequity remains a dominant issue in academia [1], [2], [3]. The lack of gender diversity in higher education is a primary concern for researchers and administrators because it has a direct impact on student learning and the potential for advancement in research and innovation in the academy.

STATEMENT OF THE PURPOSE

As research indicates, learning communities that value and celebrate gender diversity correlate with enhanced research productivity, creativity, and innovation [4], [5]. Higher education institutions that intentionally address this gap will enhance their capacity to advance student learning outcomes and faculty research competitiveness [6]. The purpose of this research is to explore the engineering culture at the university where I work by conducting a series of semi-structured interviews with current female students who have persisted in engineering and with female students who have left the college for another degree program at the same institution. The goal in interviewing these students is to gain insight to the experiences that inspire women to persist or leave the field of engineering. The results of this study provide a starting point for identifying cultural practices or activities in engineering that encourage female persistence and aspects that need to change in order to improve female retention.

LITERATURE REVIEW

The most prominent and pervasive barriers that affect gender inequity in engineering include, identity, stereotype threat, low self-efficacy, lack of sense of belonging, and gendered culture [7], [8], [9], [10], [11]. Among the literature that explores reasons for persistence in engineering, there is a lack of comparison of shared personal accounts.

FINDINGS

The findings from this research show that there are sociocultural barriers that exist in my workplace that have damaging effects on women. The most prominent of those barriers include stereotype threat and sense of belonging. Female students continue to be the target of micro-aggressions that can compound, and over time can serve as a contributing factor for deciding to leave. Similarly, a lack of support and inclusion can cause women to feel like they do not belong or potentially cannot succeed. In contrast, women are more likely to persist in engineering if they have opportunities to apply their knowledge and technical skills, and if they feel like they are a part of a supportive culture.

RECOMMENDATIONS

I recommend for future research to explore the impact of experiential opportunities, such as working in research labs or engaging in outreach, on rates of retention. It would also be fruitful to examine other universities that have high female student enrollment in engineering to understand the sociocultural elements or institutional practices at those schools that may be attractive to young women. By recruiting and retaining more female students in engineering, there is potential to strengthen research innovation and to affect a cultural change in the gender makeup of the students, faculty and professionals in the field.

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