

Thesis Project Portfolio

Bridging Industry Disparity and Engineering Education Paradigms

(Technical Report)

Gender Bias in Tech: Impact on Women

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

The overarching issue at hand revolves around the gender gap within the technology sector, which is of significant concern from both technical and STS viewpoints. On one hand, a discrepancy exists between industry needs and the education provided to engineering students, leading to a substantial portion of graduates feeling unprepared for the professional world. From an STS standpoint, this highlights broader societal challenges related to gender disparities within the tech workplace. Further analysis reveals that women face a lot of complex barriers in comparison to their male counterparts, and there are societal and organizational biases that help perpetuate these gender inequalities that favour certain groups over others in leadership roles and hiring. By addressing the gap between academic curriculum and industry demands, we can tackle both the immediate technical skill gap that new graduates face as well as contribute to broader societal goals of gender inclusivity in the tech industry.

From a technical perspective, my investigation focused on the prevalent emphasis within engineering programs on theoretical knowledge and mathematical skills, particularly in core subjects like physics, calculus, and chemistry. While these foundational competencies are undeniably important, they often overshadow the cultivation of practical skills and the application of knowledge in real-world scenarios, crucial for success in industry settings. Specifically, I found a lack of emphasis on the development of communication, business acumen, and teamwork skills, which are essential for navigating professional environments —the essential soft skills required for navigating the complexities of professional environments. This discrepancy has significant repercussions, as new graduates frequently find themselves illequipped to meet the multifaceted demands of the industry without these vital skills.

In exploring the issue from an STS viewpoint, I delved into the concept of the "Confidence Gap" as a key aspect. This term encapsulates the striking difference in job application behaviour between men and women. Research reveals that while men tend to apply for jobs even if they meet only 60% of the qualifications, women often hesitate to apply or only submit applications for roles where they meet 100% of the requirements. This phenomenon highlights broader societal challenges related to gender disparities, where women may internalize self-doubt or perceive themselves as less capable, contributing to unequal representation and opportunities in the workforce.

From the technical perspective, I proposed an Applied Learning Initiative, focusing on three key foundations: experiential learning, professional feedback, and interview readiness. This approach aims to bridge the gap between theoretical knowledge obtained during engineering education and the practical requirements of the industry, tackling the substantial divide between the skills and knowledge acquired during engineering education and the practical demands of the real world. Plans for this initiative will be geared towards continuous improvement, adaptation to industry trends, and a commitment to providing students with an education that aligns with the evolving demands of the industry. It's also essential to acknowledge that no single solution can fully address the multifaceted issue of gender disparity within the tech sector from an STS standpoint. While initiatives such as mentoring and increased representation of women in leadership roles show promise, a more comprehensive approach is necessary. Future researchers should continue exploring and implementing a diverse range of strategies, including organizational and societal shifts to foster gender inclusivity and equity in the technology industry.

I would like to express my gratitude to everyone who has been a part of my undergraduate journey and has helped shape my portfolio. Firstly, I extend my heartfelt thanks to the professors of the Computer Science department for providing me with the foundational knowledge necessary for my industry experience. I am also grateful to the faculty at the Engineering Career Center for their invaluable guidance in navigating industry-related questions and assisting me in devising a strategic plan. Additionally, I extend my sincere appreciation to my advisors within the Science, Technology, and Society department for their unwavering support throughout the entire process: From refining my topics to offering constructive feedback. Finally, I would like to express my gratitude to my family and mentors for their immense support during my undergraduate years at UVA. Their encouragement and guidance have all been instrumental in both my academic and personal growth.