



Work in Progress: Examining Diversity, Equity, and Inclusion in Entrepreneurship Programming

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Work in Progress: Examining the Experiences of Racially Minoritized Engineering Faculty in Entrepreneurship Programming

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Abstract

In recent years, interest in entrepreneurship education to advance technological innovation has grown significantly. Drawing from the business community, entrepreneurship education programs have been introduced to broader communities, including research and science. As these efforts have expanded, so has an interest in cultivating a pipeline that considers diversity, equity, and inclusion. The purpose of this study is to use Critical Race Theory to examine how entrepreneurship programs can foster an inclusive environment through understanding the perceptions of racially minoritized engineering faculty (i.e., persons who identify as African American/Black, Hispanic/Latinx, Native American/Alaskan Native, and Native Hawaiian/Pacific Islander) of an entrepreneurship program. Seven racially minoritized engineering faculty of an entrepreneurship training program participated in 60-minute semi-structured interviews to understand their sense of belonging in the program and their experiences related to respect and inclusion in the program. Two themes emerged from the data: 1) reducing structural barriers and rectifying harsh climate conditions can improve participants' overall sense of belonging and 2) representation of racially minoritized populations can be improved through more inclusive recruiting and marketing efforts. Overall, this research aims to inform practices that advance diversity, equity, and inclusion in STEM entrepreneurship programming.

Key words: I-Corps, Entrepreneurship, Engineering Faculty, Inclusion

Introduction

In recent years, interest in entrepreneurship education to advance technological innovation has grown significantly to further expand the U.S. economy [1]. Drawing from the business community, entrepreneurship education and training programs have been introduced to broader communities, including STEM researchers, to bridge the gap between research and commercialization [2-3]. As these efforts have expanded, so has an interest in cultivating a pipeline that considers ways to support diversity, equity, and inclusion. Existing research shows there are many disparities in innovation that not only affect minoritized populations but hinders creativity and economic growth [4-7]. In this study, we aim to: 1) better understand how an entrepreneurship training program can better attract and engage racially minoritized populations and 2) unpack how to help foster an inclusive environment for racially minoritized engineering faculty in an entrepreneurship training program.

Theoretical Framing

Critical race methodologies not only challenge dominant ideologies but have a strong dedication to social justice through understanding the lived experiences of people who are on the margins of society [8]. In this work, we use the principles of critical race theory (CRT) and intersectionality to frame and understand the experiences of racially minoritized engineering faculty in entrepreneurship programming. CRT says that racism is normal in American society [9]. In this work, using CRT as a lens helps us to examine the impact of race and racism in society and address hegemonic power [10]. In addition, intersectionality was used to understand critical intersections of difference (e.g., racism, sexism, classism, ableism, etc.) to uncover recurring instances of disempowerment that affect the everyday lived experiences of individuals [11-12].

Methods

In this study, we seek to understand how entrepreneurship training programs can foster an inclusive environment through understanding the perceptions of racially minoritized participants. We analyzed a subset of data from a larger IRB (IRB00000245) approved research study that aimed to understand how racially minoritized entrepreneurship program participants experience and navigate domains of power in the National Science Foundation (NSF) I-Corps program.

NSF I-Corps

I-Corps is a seven-week entrepreneurship education program that assists academics with customer discovery and identifying market opportunities. The curriculum was developed by Steve Blank and uses Lean LaunchPad Methodology, a process that focuses on experimentation, customer feedback and iterative design [13]. Instructors who teach the program use radical candor, which consists of instructors having a relentlessly direct style (i.e., instructors care personally while still challenging participants directly) [14]. I-Corps teams receive \$50,000 to support the customer discovery process and the entrepreneurial lead (EL). Teams are composed of three individuals, outside of the EL there is a technical lead (TL) and industry mentor (IM) [15]. This study focuses on the TL who is typically an NSF-funded researcher and leads the technology development [15]. The EL serves as the primary trainee and is commonly a graduate student, while the industry mentor serves as a volunteer helping to immerse teams in the industry related to their technology [15]. More than 5,000 trainees have completed the program as of 2021 [16]. As NSF continues to train researchers, NSF seeks to increase the engagement of racially minoritized participants [17].

Participants and Data Collection

This study utilizes semi-structured interview data from seven (n=7) racially minoritized participants of the NSF I-Corps program who give insight into their everyday lived experiences participating in the program. All participants were faculty members in engineering colleges or

universities within the US. This study used a semi-structured interview method [18] that allowed for probing to explore emergent themes outside of the predetermined questions posed in the interview guide. Participants were asked questions related to respect and inclusion, their perspective on the program’s effort to engage racially minoritized populations, and recommendations for improvement. All participants completed demographic information and signed informed consent forms. Each interview was recorded through a University of Michigan approved Zoom account and transcribed for analysis. Interview data was analyzed using interpretive phenomenological analysis, a multi-step process that focuses on understanding and interpreting human experiences [19-20].

Table 1: Participant Overview

Participant*	Sex	Race	Discipline
Dr. Jasmine	Female	Black	Engineering
Dr. Jeff	Male	Black	Engineering
Dr. Damien	Male	Black	Engineering
Dr. Ashley	Female	Black	Engineering
Dr. Ron	Male	Black	Engineering
Dr. Iris	Female	Hispanic	Engineering
Dr. Tee	Female	Black	Engineering

*Participants’ actual names have been replaced with pseudonyms.

Data Analysis

The data analysis process consisted of drafting positionality statements, conducting horizontalization, analyzing interview quotes, and coding data. First, the two primary authors drafted a positionality statement to explore how each authors’ personal experience impacts the study and various ways meaning is constructed from the data [20]. Next, they applied horizontalization, a data reduction process to determine which statements are significant to understand the participants' experiences [19-20]. Then, significant statements were coded to create “clusters of meaning” that identify common themes using the codes. Finally, “textual descriptions” which capture what participants experience and “structural descriptions” that explain how the experience occurred were written. Finally, composite descriptions were created from each cluster of meaning to summarize ‘what’ the phenomena is and ‘how’ it happened through the participants’ detailed explanation of their collective experiences [19-20]. After applying this method of analysis, statements with constructs related to diversity, equity, and inclusion (DEI) and programming were used for this study. Participant quotes that illustrated

specific examples of the themes in question were gathered. Lastly, repeated suggestions on how the program might be improved were examined.

Results & Discussion

Two major themes emerged from the study: 1) reducing structural barriers and rectifying harsh climate conditions can improve participants' overall sense of belonging and 2) representation of racially minoritized populations can be improved through more inclusive recruiting and marketing efforts.

Reducing structural barriers can improve participants' overall sense of belonging

The first emerging theme highlighted the need for inclusivity to be improved by addressing structural barriers. These barriers include structural program requirements such as the need for an active NSF grant and rigorous time commitment along with racial discrimination that racially minoritized participants confronted. One early program requirement is the need to have an active NSF grant within five years of the I-Corps proposal and in a related science and engineering field. However recent studies show grants are disproportionately granted to racially minoritized academics at lower rates [21]. Thus, the pool of racially minoritized academics who can participate in I-Corps is small. In addition, this accelerated program has a significant time commitment, one participant noted this commitment to be "unrealistically high." One alternative method used to balance the large time commitment of the program is to participate in the summer. However, due to excessive service obligations, mentorship expectations, and other commitments [22], racially minoritized participants, especially minoritized women, may often struggle to find additional time to participate in entrepreneurial programming. One participant highlighted that Black women are "overtaxed in service as a double minority," especially for those who are the "only Black faculty member in the department." This can be attributed to diversity targets and goals university committees employ that seek to ensure certain demographic populations are represented in decision making [23-24].

Minoritized engineering faculty that participated in the program had challenges navigating the climate and communicating the relevance of their products, especially for products that were aimed to support marginalized communities due to major differences in lived experiences. One participant described the environment as "an adversarial type of atmosphere." Stemming from issues encountered during customer discovery, a process where participants are tasked to go out and interview 100 customers to learn about customer needs and pain points. Racially minoritized participants encounter many barriers and challenges while participating in entrepreneurship programming, the culmination of these challenges may exacerbate how they experience the overall climate of the program. Often, participants said they felt threatened by instructors to meet the rigorous interview requirements which attributed to their negative experience. Another participant said:

“(I) did not enjoy the I Corps experience, which I don't think is again unique to underrepresented minorities... Every 30 minutes there was a threat of taking that \$50,000. And my response was, I don't need this grant. You can have it. I don't need your threats. I'm here because I want to be here, and I have made all the funding... I don't need to be hazed in the process.”

Lastly, one participant noted struggling to have instructors and participants understand the relevancy of her product due to cultural and demographic differences. They said:

“A challenge [that] maybe we have always seen, as women engineers and as underrepresented minority engineers, is the like mindedness or the lack of support from those who may think like you. And sometimes, that can be a challenge when you're trying not only to convince the venture capitalists to support and invest in your product, but you're also trying to convince other I-Corps participants that your product is relevant.”

As a result, this participant had to put additional time into helping instructors and participants understand the cultural relevance of her technology that greatly impacts communities of color.

Representation of racially minoritized populations can be improved through more inclusive recruiting and marketing efforts

The second theme highlighted ways that entrepreneurship programs exclude racially minoritized populations in marketing and recruiting. As it relates to recruitment, multiple participants thought that the program insufficiently marketed itself to racially minoritized participants. One participant voiced, “I didn't feel like [the program] was marketed to me” and another commented “I wish that there had been more African American people.” Some participant recommendations were to market itself “to historically Black colleges and other schools with minority populations, then that [I-Corps] will definitely see more folks from those backgrounds engaged in the program.” This implies that [the program's] current marketing scheme may be ineffective in attracting racially diverse populations.

Conclusion & Recommendations

It is critical that entrepreneurship programs understand how systemic barriers and biases are intertwined within their programs and recruitment approaches to address them. Findings emphasize that entrepreneurship programs can reform structural aspects of programming that can hinder racially minoritized engineers from positive participation in programming. This may be done by removing unnecessary application requirements that disqualify minoritized populations in engineering and decreasing excessive workloads. The study also highlights the importance of

understanding target markets when creating recruitment plans and materials for minoritized engineering populations. Whether this takes form as an expansion of recruiting efforts at diverse institutions and organizations, more awareness is needed around ensuring content and delivery is culturally relevant and inclusive of racially diverse populations. Future work includes an investigation on how unequal domains of power impact the experiences of racially minoritized populations in STEM entrepreneurship. As society pushes to cultivate a diverse and innovative future through entrepreneurship education, findings from this work offer insight into how programs can better support racially minoritized populations.

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