

Investigating Transition Phases: An Autoethnographic Study of International Women of Color Engineering Educators in the U.S.

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The study aims to explore the transitions experienced by international Women of Color (IWOC) engineers in the US as they navigate their academic and professional lives. Motivated by the lack of research on IWOC's experiences, specifically around transition points of their lives, four international Women of Color participated in this qualitative auto-ethnographic deep-dive. All four researchers have attended college in the United States for their high educational degrees focused on education/engineering education and are currently involved in engineering education scholarship work.

Through a collaborative autoethnography approach grounded in transnational feminism, this study observes the unique challenges and barriers this group faces. Previous research highlighted that transitions start for international students even before they arrive in the USA, and since then, they go through multiple transitions. While international students'/scholars'/workers' experience is an emerging area in engineering education, there is a lack of research specifically focused on International Women of Color.

Importantly, our narratives challenge the traditional notion of IWOC as a monolithic identity. The topic is important as it highlights the unique challenges faced by this group and the need for structural and mentorship support and resources to facilitate their transition as the individuals evolve. The findings have implications for policy and practice, particularly in the areas of support services and resources for international Women of Color students. Also, our research has direct implications for mentorship strategies and faculty development.

Keywords: international Women of Color, Collaborative Autoethnography, navigating US higher educational and workforce development, equitable education.

1. Introduction

In the United States, women make up 14% of the engineering workforce (15% internationally), according to SWE Research Fast Facts, 2022. In 2020, 24% of bachelor's degrees in engineering were earned by women, and women of color earned 10% of the total engineering degrees. However, there is no existing data particularly dedicated to international women of color in engineering. Women of Color are often presented as a monolith in all the statistical reports. While the overall number of STEM workers in the United States increased by 44.5 percent between 2000 and 2019, the number of immigrant STEM workers more than doubled over the same period. By 2019, there were almost 2.5 million immigrant STEM workers, compared to just 1.2 million in 2000. Women workers still remain underrepresented among STEM workers overall, as well as among immigrant STEM workers. While the share of STEM workers who are

female has increased slightly since 2000, only 26.8 percent of all STEM workers were female as of 2019. Women made up 27.2 percent of all immigrant STEM workers in 2019. Additionally, those international/immigrant women's experiences are documented under the umbrella of women of color.

Building on the description from the Migration Policy Institute [1], the word international refers to people who are naturalized citizens, lawful permanent residents, and persons on certain temporary visas (e.g., F-1 student visas, J-1, H1-B work visas, etc). In this paper, we employ the term Women of Color to collectively indicate those who are most impacted by systemic racism [2] as well as “build solidarity and strive toward shared understanding” [3]. Included in this group are Asian women who are often excluded from equity-related STEM studies because of their ‘overrepresentation’ in STEM. However, previous research has shown that Asian women also navigate gendered and racialized obstacles in STEM programs [4], [5]. Therefore, it is critical to investigate the engineering experiences of international women in engineering through different stages of their lives, as there is very little known about their academic and industry experiences in the United States.

In this study, we aim to capture the nuances and experiences of being international women of color within the engineering context in the United States through a series of vignettes. The vignettes were meant to capture the experiences during the several transitional points that international women of color often go through, for example, their first experience of studying at a US institution, their entry in the United States, then completion of their degree, deciding to go in academia, industry or other career path, immigration challenges, etc. Those stories will work as a first stepping stone so that those women can be retained within the workforce and mentored effectively, and their well being are also taken care of.

2. Guiding Framework

Transnational Feminism [6] is used here to frame the global cultural contexts of international women's experiences within the US-based engineering education environment. Transnational Feminism posits that international women of color establish and maintain strong social connections that link their country (or countries) of origin to their country (or countries) of settlement. The term transnational feminism offers transformative actions for disrupting oppression and achieving liberation in global cultural contexts. Transnational feminism acknowledges a wide range of interacting forces that impact intersectional relationships for women in a geopolitical context [7]. Transnational feminism acknowledges that women's experiences are different not just because of race and gender, they also differ due to ethnic and cultural identities, and this framework has a place for international identity. Our study adds how being international women of color within the engineering ecosystem adds layers of challenges and obstacles. To capture those unique cultural challenges, we utilized the transnational

feminism framework. In our study, Transnational Feminism has been used as a framing for interpreting the narratives of each of us.

We also draw from **Schlossberg's Transition Theory** [8], which describes people's adaptation in response to transition. Transition in this theory indicates those "occurrences and non-occurrences that elicit certain changes in the individual perceptions - of self., of the world and that simultaneously call for new patterns of behavior that may or may not be effective" [6, p. 7]. Moreover, the transition may be a continuous process involving phases of assimilation and continuous evaluation as *individuals enter, go through, and eventually come out* of the transition [9]. The model suggests interconnected factors that influence the adaptation process in response to the transition: situation, self, support, and strategies [10]. Among these "4S" categories, self and strategies are more in an individual's control, whereas situation and support may be externally influenced and beyond their control. Moreover, this theory notes how seemingly similar events can be perceived differently by people with different identities and demographic groups, such as race, socioeconomic status, and international student status [6][7]. This model or perspective helps us unpack our experiences as we engage in exploring various transitions in this collaborative autoethnography work.

3. Methods

Autoethnography (AE) can be described as a study of the self, where the self acts as a window to the world, society, or culture. AE, where the researcher acts as both participant and researcher, oftentimes gets critiqued for being self-absorbing and mere naval-gazing. To overcome the limitation of AE, in Collaborative Autoethnography (CAE), a team of researchers works collectively to collect, analyze, and interpret data to "gain a meaningful understanding of sociocultural phenomena reflected in their autobiographical data" [11, p. 24]. By allowing each researcher to share their narrative in a way that resonates with others, collaborative autoethnography is regarded as a transformative process that fosters community.

The process started with Author 1 and Author 2's continuous virtual conversations over text messages, emails, and video conferencing platforms such as Zoom. After several exchanges, both of them decided on the topics and came up with some prompts pertaining to the topic of interest, IWoC's transition experiences building on the transition theory [6]. Also, all the authors met on Zoom collectively twice. Author 1 and author 2 discussed the findings and their narratives multiple times. We made sure to maintain the trustworthiness of our research by capturing the thorough narratives of each researcher. We also ensured the member check-in process.

The overarching prompt for this autoethnographic exploration includes, "*How do you define being international? What role does it currently play in your life? How has this definition and role changed in the past year and been impacted by your recent experiences as an engineering*

education scholar? Discuss some transition points of your lives as an international scholar engaging in engineering education.” Additionally, we brainstormed and came up with some example transition points to explore, such as Transition into being an international student, Transition into engineering /engineering education, Transition out of engineering /engineering education, Transition into a job, etc. We considered the challenges/barriers faced and the support/resources received in all of these transition points while drafting our prompt responses or reflexive narratives.

Author 1 invited Authors 3 and 4 to take part in the data collection process based on their shared interests. We then began writing individually. To write individually, we engaged in a “data generation exercise” [12], which includes chronologically listing major events or experiences, the circumstances of these events as well as stating why these events are important. In terms of collaboration style, we adopted Partial concurrent collaboration, where researchers contribute to different stages in the process but do not fully engage from the beginning to the end.

The concurrent model allowed us to write individually based on the overarching prompt and then share stories with the team. Sharing the stories with the group helped us add probing questions in the form of comments or suggestions to polish our narratives and also make the narratives more streamlined. We used narrative inquiry to explicate various transition points of our life as an IWoC. Our CAE “produces a polyphonic or multivocal text, one that adequately captures the areas of commonality and divergence in your experiences” [11, p. 95].

Since we framed our study using transnational feminism and transition theory, we made sure our narratives focused on our international identities and challenges navigated by us in the US higher academia and industry, and finally, we highlighted different transition points of our lives. To synthesize our narratives, we reviewed each prompt response to get a sense of the data while noting the four subcategories of the transition points described (situation, support, self, and strategies). We identified recurring patterns through open coding and connected emerging themes with the available theory and literature. Author 1 and Author 3 did prepare the initial findings section and later brought it to the group. Later, we reviewed our article multiple times individually and as a group until we were all satisfied with the final product. Currently Findings section presents the synthesis, highlighting the point of similarities and contrasts aligning with the transition theory.

4. Introducing Ourselves

As a research team consisting of four individuals from diverse yet similar, backgrounds and experiences, we recognize the importance of acknowledging our positionality in the research we report on. Our individual identities and experiences shape our perspectives and inform our research approaches.

Author 1 brings a unique perspective as a South Asian Muslim woman pursuing a graduate education. Her personal experiences of exclusion and marginalization drive her research focus on creating inclusive environments for diverse student populations. Her involvement in this study stems from ongoing discussions with other authors and a desire to foster a sense of community.

Author 2, a woman of color and scholar with an international background, has faced invisibility and navigated institutional barriers in higher education. Her experiences motivate her to explore equity and anti-racist pedagogy, and she is drawn to this study due to its focus on intersectional complexities.

Author 3, a woman of color in a technology leadership role, emphasizes centering the human experience in emerging technology and increasing representation among marginalized groups. Her international identity has influenced her career choices, and she seeks to document her experiences and encourage others to share their stories.

Author 4, a woman of color and instructional professor in engineering education, focuses on non-cognitive abilities and student success. Her diverse identity as a catholic, female, and Hispanic individual informs her teaching and research, enabling her to create inclusive spaces where students from all backgrounds feel valued.

Together, our varied backgrounds, experiences, and research foci converge to inform our research approach. We recognize the importance of reflexivity and critical self-awareness in our research, acknowledging how our positionality influences our interpretation and analysis of data. By centering our own experiences and perspectives, we aim to create a more nuanced understanding of the complexities we study. Our goal is to contribute to the development of inclusive and equitable educational environments, and we believe that our diverse positionalities strengthen our research and enhance its impact.

5. Findings

The experiences of all co-authors as women of color in engineering are a testament to the challenges that underrepresented groups, such as those international in the US, face in STEM fields. Despite often encountering challenges ranging from a lack of culturally inclusive mentorship to even xenophobia and racism, they have demonstrated resilience and determination in pursuing their academic and professional goals.

As international students (current or prior), we have had to adapt to new cultural and educational environments while also facing gender biases and stereotypes in male-dominated fields. Our stories highlight the importance of effective strategizing and support systems - supportive mentors, networking, and self-advocacy in navigating academic and professional transitions.

Moreover, our stories underscore the significance of intersectionality in understanding the experiences of women of color in engineering. It is crucial to recognize that gender, race, and international student status intersect to create unique challenges that require tailored solutions. By sharing their narratives, we, the co-authors, hope to inspire others who are international to pursue and persist in careers in engineering and encourage institutions to create inclusive environments that support the success of all students, regardless of their background. The in-depth narratives can be found in *Appendix A*.

5.1 Synthesis

In the following, we unpack our experiences aligning with the components of the transition theory, Moving in, moving through, and moving out, and thinking of the subcategories in each phase (situation, self, support and strategy) in a narrative form. Summarized excerpts from the co-authors' narratives, which were thematically categorized into situation, self, support, and strategies aligning with Schlossberg's Transition Theory [6], can be found in *Appendix B*.

To describe the international scholar identity, Author 4 describes,

Being international is being born or raised in one country while residing or working in another, holding different citizenship, or identifying with a cultural or ethnic heritage that differs from one's country of residence.... Being international, basically, this involved leaving behind familiar surroundings: family, industry job, etc., and adapting to a new cultural and educational environment.

This response sums up well the moving in phase of the transition into the international scholar identity. It covers leaving the known support and life behind and possible apprehension towards the new educational as well as social culture. All of us adopted the identity of being international students in graduate education. While three of us came from an engineering background, one came from psychology. While “this experience was definitely challenging,” we also acknowledge and agree that these experiences presented lots of opportunities for personal growth and cross-cultural learning (Author 4).

Academic and cultural differences are listed as one of the prominent obstacles that made the transition into this international role challenging for most of us. One of the main attributes of academic challenges was academic expectations, as demonstrated in the narrative of Author 1. They face challenges in technical classes, such as implicit expectations and language barriers, which result in getting a lower grade in the class, putting her graduate contract in jeopardy. She recounts feeling like a “good student” but uncertain about their abilities. Later, she learnt the trick to cracking the technical classes, which increased their class participation as well as my grade. To learn about the tricks or the rules of the game, Author 1 sought support from peers from the home country. They recollect, “If I think back in both of the classes, this hidden rule

was not written anywhere”(Author 1). Whereas Author 2 focused mainly on self-advocacy to tackle the various challenges such as setbacks in academics, xenophobia, and racism.

Cultural differences also came in the way of our interpersonal relationship. Author 1 noted that she hesitates to speak up due to language ambiguity and fear of not being understood.

In the classroom and other settings where people talk, I oftentimes shy away because even if things make sense in my head, I am not sure those make sense to people around me when I try to explain things in English. I recall people staring at my face with a blank expression after I finished speaking, leading me into a spiral of "Did I make sense?"

Similar to Author 1, Author 4 also notes the challenges with language in academic settings, leading her to feel “ like I didn’t belong and doubting my abilities, feelings of inadequacy.” For Author 1, religion became a prominent factor that shaped her entire experience. She mentions finding ways to avoid physical touch, like hugging and handshake, and social hours at bars due to religious values and struggles with finding suitable attire for professional events. However, she started attending social hours, recognizing that these settings are important spaces for informal conversations, after discussing the concern with other Muslim peers. Also, coming from a culture where women mostly seem subservient, the newfound agency in shaping our future was not always well appreciated by people surrounding us,

One thing that particularly strikes me is the notion of allyship. I have observed, through my own experiences and second-hand through those of my friends and family, that the most jarring remarks about choices made by international women of color (such as to pursue a higher education versus getting married, choosing motherhood, etc.) came from men (particularly international men of color) who one might imagine should be able to empathize with journeys similar to theirs. This truly drives home the point of intersectionality to me. (Author 3)

Author 2 also reciprocated similar sentiments in her narratives,

On the personal front, I deal with a lot of microaggression as I chose to remain single, and many international male colleagues probably find that unusual and throw unwanted remarks. Choosing my ambitions over some personal decisions always becomes a point of conversation when I meet mostly male international colleagues.

To overcome the cultural barrier and navigate misogyny, both of them relied on their support system and built more resilience. They both chose their ambitions and priorities over societal expectations.

For International women of color in US graduate programs, the level of support (department, advisor, peers) varied based on the university and discipline for us. While STEM disciplines are White and Asian heavy, established programs might have some support structures. For example, author 3 highlighted the immigration support she received from her mentor and managers.

Always grateful to my advisor for working on visa-related issues with me. Same with my managers at my workplaces... They did not understand the processes themselves, but never let that be a deterrent to helping me navigate those successfully.

Programs that are not tailored to support international students generally, and international women of color specifically, can impact students' experience significantly. Literacy education is not a discipline that intakes the majority of international students, unlike STEM disciplines. Hence, author 2 had to navigate a very different environment related to immigration.

I was the first international student in my department, hence, my department had no idea on how to support me through the academic program. International women and faculty definitely have different needs for mentorship. The mentorship that I received was not culturally inclusive, on top of that the academic mentorship that I received was not aligned to my expertise and interests. My PhD experience has been difficult as I felt extremely helpless and no one was available to mentor me navigate through some of the experiences as my previous adviser left the university once I started to work on my comprehensive exam. I was left without an academic adviser and major professor for a significant time. I was on my own and I experienced a lot of xenophobia and racism from my cohorts. I encountered a lot of White savior complexes and the impression from people that my presence itself in the department was a favor done to me. (Author 2)

While the challenges were hard to navigate, Author 4 notes,

They made me more resilient, I developed problem-solving abilities and I learned to find different people for different types of mentorships and advising I needed during that time.

While international students are resilient and focus on individuals' agency and glorify their assets or capital, there are dark sides to it [13]. Focusing entirely on resilience obscures the lack of support and structure that helps students succeed in their academic endeavors and careers.

Being one of the few or only one in the educational setting came up as another significant factor that shapes our experience. Some of us took this lack of representation into stride and made it a goal to launch into solving this, finding our way to engineering education,

Here in the U.S., I learned about intersectionality - now, not only did I see fewer women in the engineering classrooms, as I had before, I saw an even fewer number of women of color - Fewer women like me. I was introduced to the challenge of the lack of Representation of women in engineering. Determined to understand and DO SOMETHING ABOUT THIS: I enrolled in a PhD in Engineering Education, to learn more about why there were so few under-represented minorities in engineering, and what could be changed or done differently. (Author 3)

All the authors captured the sentiments of a more welcoming atmosphere in engineering education. The space in engineering education is more welcoming and nurturing as it equips us with knowledge and practice to inform our research and practice.

My transition into engineering education has been the most rewarding professional experience of my life. I found several mentors who were always willing to help me and wanted me to be successful. Most of them are women and women of color in STEM, probably their own experiences of microaggression made them lookout for the younger folks in the field. Since I entered the field of engineering education in 2020, I felt most valued and I thrived. I still continue to work on engineering education and I expanded my collaboration as well and I started to take women of color and other marginalized identities under my wings as a gratitude to my mentors. (Author 2)

For me, being international plays a significant role in my life as an engineering education scholar. As someone who has lived and worked in different countries, I bring a diverse perspective to my research, teaching, and interactions within the academic community. My international background influences how I approach topics in the classroom and in my scholarly work. Engaging in collaborative research projects with colleagues from around the world has deepened my appreciation for the interconnectedness of global issues in engineering education. Also, recent global events have highlighted the importance of cross-cultural understanding, empathy, and collaboration in addressing complex challenges facing the engineering profession. (Author 4)

Among four, three of us have taken a professional role where they continue to create their squad and mentor other students who navigate similar sorts of experiences. While Author 1 is still in her Ph.D. program, she faces uncertainty and limited support, with conflicting advice from peers and mentors. She hopes for a better future but is unsure of what awaits ahead of her, especially with immigration limitations.

We utilized Transnational Feminism for this particular study as the researchers are from across the globe, and their narratives are catered to navigating US higher academia and industry experiences. Through this theory, we seek to destabilize notions that women around the world share the same types of experiences, oppressions, forms of exploitation, and privileges; we

explored differences and inequalities between women, such as different priorities, career choices, nationalities, privileges, and different ways of understanding of conceptualizing agency.

Though the rest of the authors moved out of the PhD programs, they are still navigating their post-phd tenure in professional settings. All of them currently focus on self-advocacy, seeking support from women and women of color in STEM, and expanding their collaboration to build squad capital. Overall our experiences emphasize the need for understanding and addressing the challenges faced by international students and women of color in STEM fields in order to be able to support and mentor them better.

6. Discussion and Implications for Practice

Stories humanize us. They emphasize our differences in ways that can ultimately bring us closer together. They allow us to see how the world looks from behind someone else's spectacles. They challenge us to wipe off our own lenses and ask, "Could I have been overlooking something all along?"

Reminding us of the power of storytelling, Delgado [14] notes that stories, parables, chronicles, and narratives are powerful means for altering the mindset of people as these invite readers to understand the narrative's point as well as reflect on their presuppositions, received wisdom, to test the narrative against their reality. In this paper, we engaged in a collaborative autoethnography process to bring forth our voices that might be hidden, as well as elucidate the common yet different understanding we share among ourselves. International status oftentimes, in tandem with multiple other aspects of identity, shapes how we make meaning of our surroundings. Through this work, we would like to open up an opportunity to let others see "how the world looks from behind someone else's spectacles."

We found from our synthesizing across reflections that international students undergo significant transitions when they leave their home countries to pursue education abroad. These transitions can be both simultaneously exciting and intimidating as students must navigate new cultural, academic, and social environments. Despite the potential for personal growth and professional development, international students may often feel marginalized and overlooked. They may often struggle to find a sense of belonging, questioning whether they truly matter in their new communities.

On the personal front, international students' experiences may often be marked by feelings of displacement, disorientation, and disconnection. They may grapple with language barriers, cultural differences, and homesickness, leading to emotional distress and difficulties adjusting [15, Ch. 6]. Moreover, on a professional front, the transition to a new educational system can be particularly challenging, as international students must negotiate unfamiliar academic norms, cultures, and expectations. In light of these challenges, it is essential to recognize the

complexities of international students' experiences and provide targeted support to facilitate their successful transition and integration. By acknowledging and addressing their concerns, we can foster a more inclusive and supportive environment that values and simultaneously empowers international students.

The term "international" encompasses a diverse group of students from various backgrounds, cultures, and experiences, coming to the US from different regions [16]. This makes it essential to recognize that international students cannot be defined by a single narrative [17]. Each student brings their unique identity, facing distinct challenges and experiences that are difficult, if not impossible, to be generalized. It is crucial to avoid homogenizing international students and while research should attempt to glean transferable insights from groups of international individuals, we must also simultaneously acknowledge and address their individual needs and concerns to create a truly inclusive and supportive environment.

Creating a welcoming and inclusive campus culture is vital to ensure international students feel valued and supported. This can be achieved through initiatives that promote cross-cultural understanding, such as cultural events, workshops, and dialogue programs. By fostering a sense of belonging, institutions can help international students feel more connected and engaged with their academic community. Furthermore, providing resources that cater to the unique needs of international students, such as language support and cultural orientation programs, can significantly enhance their academic experience. These resources not only aid in their transition to a new academic environment but also empower them to excel in their studies and become active contributors to the academic community.

Within a university, peers and faculty are often the closest contact points for most international students. Literature notes the language barrier as one of the barriers to positive interactions. However, it is to be noted that sometimes the barrier does not indicate the individual's inability to carry out the conversation; rather, it is more a lack of information on how to handle uncertain and ambiguous situations (e.g., implicit expectations, hidden curriculum) or conversations in this context. In narrative 4, we see a glimpse of loneliness and isolation resulting from dealing with a situation or system that is unclear and ambiguous and from having little or no help from family. Girmay et al. [18] note three different kinds of loneliness occurring in international students, and one of them is cultural loneliness, which indicates the absence of “familiar culture and native language surrounding the student” [15, Ch. 1]. In our narratives, we all note going through cultural loneliness by not having someone like us in our program who looks like us or shares the same language. Given a significant amount of time in graduate life or necessitates having regular conversations with advisors/supervisors/mentors, recognizing and understanding the ways in which they can assist international scholars can go a long way. One way to approach international scholars, especially international women of color, is to adopt culturally sensitive

mentoring [19], as during graduate life, “evolving identities can be nurtured, crushed or developed during the often intense interpersonal interactions involved in supervision” [20, p. 94].

Lastly, supporting international students extends beyond their academic tenure [21]. Providing resources that prepare them for their future careers, such as career counseling and networking opportunities, can significantly benefit their long-term success. By investing in their future, institutions can build a strong alumni network and foster global connections that benefit both the academic community and the world at large.

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Appendix A

5.1 Narrative 1: AuthorX

I came to the United States as an international student from India to study a literacy education Ph.D. program at a midwestern Historically White Institution (PWI) high research (R2) university. I came from a heavily quantitative mindset due to my background in psychology in India. The transition to literacy education was a difficult experience due to cultural differences and different academic expectations between two countries. I was the first international student in my department, hence, my department had no idea on how to support me through the academic program. International women and faculty definitely have different needs for mentorship. The mentorship that I received was not culturally inclusive, on top of that the academic mentorship that I received was not aligned to my expertise and interests. My PhD experience has been difficult as I felt extremely helpless and no one was available to mentor me navigate through some of the experiences as my previous adviser left the university once I started to work on my comprehensive exam. I was left without an academic adviser and major professor for a significant time. I was on my own and I experienced a lot of xenophobia and racism from my cohorts. I encountered a lot of White savior complexes and the impression from people that my presence itself in the department was a favor done to me.

Then after my PhD, I completed my first doctoral fellowship and I navigated the journey all alone. Finally, my transition into engineering education has been the most rewarding professional experience of my life. I found several mentors who were always willing to help me and wanted me to be successful. Most of them are women and women of color in STEM, probably their own experiences of microaggression made them lookout for the younger folks in the field. Since I entered the field of engineering education in 2020, I felt most valued and I thrived. I still continue to work on engineering education and I expanded my collaboration as well and I started to take women of color and other marginalized identities under my wings as a gratitude to my mentors.

Currently, I am on a tenure track position in curriculum and instruction with the Schools of Education in a rural institution which is also a Hispanic-serving institution. I continue to research, teach and mentor. Many of my students are nontraditional in service teachers. I collaborate with them closely and I always try to make them feel welcome that I always received from the engineering education community. Also, I mentor a lot of racially marginalized and international students because of my own past experiences and positionality. I feel prepared to serve on all the roles and expectations due to my exposure to engineering education. However, there are still incidents of tokenism and invisibility even after I transitioned into the faculty role. I am learning to build my own squad capital in collaboration with colleagues who share marginalized identities like me and help each other grow through intellectual collaborations. On the personal front, I deal with a lot of microaggression as I chose to remain single, and many international male colleagues probably find that unusual and throw unwanted remarks. Choosing my ambitions over some personal decisions always becomes a point of conversation when I meet mostly male international colleagues.

5.2 Narrative 2: AuthorX

I was trained as a mechatronics engineer and was interested in robotics and sensor development. I wanted to pursue higher education towards sensor technology, which is what brought me to the United States, as a

20-year old fresh out of undergrad. I started working as a researcher. As a twenty-something year-old, who graduated as a Mechanical Engineer, I was used to finding myself as the only woman in the engineering classrooms in India. Post undergrad, I traveled 7000 miles away from home in pursuit of higher education, after a scholarship brought me to Virginia Tech (and to the United States of America).

Here in the U.S., I learned about intersectionality - now, not only did I see fewer women in the engineering classrooms, as I had before, I saw an even fewer number of women of color - Fewer women like me. I was introduced to the challenge of the lack of Representation of women in engineering. Determined to understand and DO SOMETHING ABOUT THIS: I enrolled in a PhD in Engineering Education, to learn more about why there were so few under-represented minorities in engineering, and what could be changed or done differently.

I earned my doctoral degree in 2017. Since earning my doctorate, I have used my training, education, and experience in leading Global People Research & Analytics at McGraw-Hill, as well as collaborated as a researcher, advisor, and/or evaluator on several research projects, including those funded by the National Science Foundation.

One thing that particularly strikes me is the notion of allyship. I have observed, through my own experiences and second-hand through those of my friends and family, that the most jarring remarks about choices made by international women of color (such as to pursue a higher education versus getting married, choosing motherhood, etc.) came from men (particularly international men of color) who one might imagine should be able to empathize with journeys similar to theirs. This truly drives home the point of intersectionality to me.

Always grateful to my advisor for working on visa-related issues with me. Same with my managers at my workplaces, both at McGraw Hill and Amazon. They did not understand the processes themselves, but never let that be a deterrent to helping me navigate those successfully.

5.3 Narrative 3: AuthorX

Being international, basically, this involved leaving behind familiar surroundings: family, industry job, etc., and adapting to a new cultural and educational environment. I came to the US from my home country where I got my bachelor's degree in engineering, and I was working for the industry as a design engineer. The transition from working to becoming a student again was challenging due to the differences in the routines I had and also because the education system was totally different to what I had experienced during my college experience. I had to navigate immigration procedures, adjust to a different language. This experience was definitely challenging but also presented lots of opportunities for personal growth and cross-cultural learning.

This transition into an engineering education program involved immersing myself in the newly developed engineering education field. It was very different to what I had done as an engineer or what I had studied in college. I had to attend very small classes, with a lot of discussions, in a foreign language. I faced several challenges as an international student, but they made me more resilient, I developed problem-solving abilities and I learned to find different people for different types of mentorships and advice I needed during that time.

After completing my PhD in engineering education, I became a faculty member in a smaller engineering education department. Once again, I had to adapt to the new workplace dynamics, improve professional

skills, and apply theoretical knowledge to real-world problems. This department was always very welcoming, and feeling as an international was somehow more normal.

To sum up the challenges I felt was feeling isolated or experiencing culture shock in the new country. I faced language barriers and I struggled to find community at the beginning. Feeling like I didn't belong and doubting my abilities, feelings of inadequacy.

Being international is being born or raised in one country while residing or working in another, holding different citizenship, or identifying with a cultural or ethnic heritage that differs from one's country of residence. For me, being international plays a significant role in my life as an engineering education scholar. As someone who has lived and worked in different countries, I bring a diverse perspective to my research, teaching, and interactions within the academic community. My international background influences how I approach topics in the classroom and in my scholarly work. Engaging in collaborative research projects with colleagues from around the world has deepened my appreciation for the interconnectedness of global issues in engineering education. Also, recent global events have highlighted the importance of cross-cultural understanding, empathy, and collaboration in addressing complex challenges facing the engineering profession.

5.4 Narrative 4: AuthorX

I feel like the character Aisha from the movie *Wake Up Sid*, where she tore all her writing just the day before submission. To write the editorial titled "New Girl in the City," Aisha wonders what she can write about the city of Mumbai that no one has written already. Similarly, I felt the same way about what I could write about international students that is not in literature or other outlets. To be honest, this writing is hard for me as I sense a hesitation in me and wonder how I can write as well as express my experience in a certain way that will be presentable to the wider audience. With that being said, let me take a stab at it while focusing on two things less talked about international students: Ambiguity and Uncertainty. A few days ago, I was invited to a graduate student panel, and I was told to come up with a title that signifies my Ph.D. life so far. Without hesitation, I picked the title "Lost in Transition." The reason for this selection was that it felt like I was just going through multiple phases with little to no certainty, so it is kind of unknown to me whether the phase has ended or not- A journey full of ambiguity and uncertainty.

I came to the US, unfortunately, with very little knowledge about research or how graduate life will be. I was fortunate that, at that time, I had Bangladeshi flatmates who were also studying in the CS program. Additionally, I connected with two other incoming Bangladeshi Ph.D. students. Having these people helped my initial transition, like opening a bank account, and doing the necessary HR paperwork. However, I remember reading a lot of how-to guides like how to navigate advisor-advisee relationships, how to be a graduate student, and so on to get a handle on this new life. The first challenge I would say I felt in a technical class where I didn't know how to play the game, and I struggled academically. In retrospect, I realize there were lots of implicit expectations embedded in that class that I had no way of knowing beforehand. The class focused heavily on class participation, and I was not accustomed to studying the topic beforehand. It was disheartening as I would say I am a high-achiever and a "good student," but I was also worried that it might hurt my GPA and maybe the GAship. My doctoral program required a 3.33 to maintain my GAship, which added a fair share of stress and sadness. However, in my second semester in another technical class, I did pre-read the materials before the class, which increased my class participation as well as my grade. But if I think back in both of the classes, this hidden rule was

not written anywhere. After spending a lot of time in agony and anxiety, I got to know these little tricks to navigate classes.

In the middle of my first semester, I was told to find a different lab. I was fortunate that it happened at the beginning of my Ph.D., so I had a bit of time and funding to find my next advisor. My flatmates and friends were supportive of me as they suggested ways ranging from finding a new professor to finding a new program to finding a new university. That time was stressful because it made me inadequate, such that I couldn't even manage to stay in my program and in the lab for two months. Fortunately, I came in touch with my current advisor, and I started my journey with engineering education.

Transition into engineering education came with its own merits as well as demerits. My advisor is quite nice and helpful, and after the first meeting, I felt this was a setting where I could talk and discuss in plain language, unlike my previous meeting, which was purely technical and task-focused. However, the **learning environment as well as the meetings**, brought another layer of ambiguity and challenges. Usually, there were a lot of discussions and opportunities where people could bring their own lived experiences (e.g., academic and professional). My education-focused classes were overwhelming for me because it felt like no matter what I did, I would not catch up to my peers. The Race-based system in the US and its history is completely new to me, and it seems like there are a lot of new things for me to gather, and none of my previous experience matters (e.g., my computing background). Even though there is a lot of reassurance, those settings kind of failed to make me psychologically safe.

Before starting my research in this realm, I did not think about how I, as a researcher, might impact my work or how complicated the relationship between my research and me can be. However, in broadening participation area, there is a certain implicit hierarchy of whose experience matters. At the beginning of the engineering education program, I considered researching international student experiences. However, this topic seemed understudied in engineering education scholarship, and studying it might not gain the same recognition as other topics. People also advised me to choose a research topic to increase my future employability, as research in the DEI sector is better suited for white and/or domestic folks and not for international students like myself. I realize, though, that I can offer a unique perspective to investigate things I have never explored or wondered about and, potentially, that other cultural insiders do not explore or wonder about. But hesitation strikes here again: who is willing to listen to the story of a Muslim international woman who does not speak native English?

Additionally, language ambiguity, as well as the lack of people with whom I could bounce ideas in my own language, posed another challenge. In the classroom and other settings where people talk, I often shy away because even if things make sense in my head, I am not sure those make sense to people around me when I try to explain things in English. I recall people staring at my face with a blank expression after I finished speaking, leading me into a spiral of "Did I make sense?"

Nowadays, we hear a lot about positionality, however, I really struggle with this, to be honest, because I think Religion is a huge part of me and my lifestyle. But none of my current academic parts has any connection to it. In engineering education, I see very little work on religion. I knew the place I came to study was a non-muslim country, so there were certain things I would not expect, like religious holidays, and the availability of Halal food options. Initially, I used to avoid public gatherings like social hours, where people gather to socialize, oftentimes over drinks. However, now I realize the most important

things (e.g., networking) happen in these sorts of settings. Also the culture of handshakes and hugs, I try to avoid any sort of physical touch as it is not aligned with my religious values. I remember searching on the internet to learn how to avoid handshakes without offending someone, such as keeping things in both hands so people don't forward their hands. During our conversation at the previous ASEE, a fellow Muslim scholar introduced me to a third scholar. When I mentioned that I don't shake hands, He said something that I don't exactly recall, but it kind of implied that the other scholar does shake hands, why don't I? Also, my religious attire does not fit into the definition of professional attire. So I remember asking about the suitability of my attire before any professional event like conferences.

Overall, when people ask me to write about my values or what defines me, I often say I am a complainer. I do not know how and when this trait grew in me, maybe from childhood or maybe sometime more recently. Being compliant means I am a rule follower. It means following the rules in the research area, like researching the things that are acceptable and more recognized to a broader audience or making sure I do not disrupt order, hence managing things on my own. It also means that I settled or played safe in a lot of places where I could've done something different. Like during COVID, I did not ask for any accommodation. I created my workspace and bought techy things like headphones and stuff. Also, I remember submitting my project and taking final exams during my religious holidays or while fasting. I understand why I didn't ask for things or why no one asked me if I needed anything- my department was kind of new, and I was part of the first cohort. When the second and later cohorts came, I saw how people like my labmates were blunt in terms of asking for accommodations or tech materials. Observing the new people kinda made me realize the somewhat missed opportunities.

As I am now thinking of my transition out of my Ph.D. journey, there is a lot of uncertainty around it with very little support. I hear from most people there are tons of opportunities for you, but at the same time, people with international backgrounds tell me I do not have the luxury of picking and choosing given my visa status. I am not sure what future awaits me, but I am hopeful that things will work out.

Appendix B

The following are summarized excerpts from the co-authors narratives, that were thematically categorized into situation, self, support, and strategies aligning with **Schlossberg's Transition Theory** [6]

Situation: Author 1, a woman of color engineering student in academia, faces various transitions and challenges throughout her career, magnified by her international student status and gender. She recounts feeling like Aisha from the Bollywood movie *Wake Up Sid*, struggling to find her voice and express her experiences in a presentable way. She titles her Ph.D. journey "Lost in Transition" due to the multiple phases she navigated with little certainty. Author 2 began as an international student in a Ph.D. program at a midwestern Historically White Institution (PWI) high research university, navigating cultural differences and academic expectations. She experienced xenophobia and racism from her cohorts and her education lacked culturally inclusive mentorship. After completing her Ph.D., she faced similar challenges in her first doctoral fellowship and felt isolated. However, her transition into engineering education now brings her rewarding experiences - finding supportive mentors, and valuing her contributions. Currently, she is on a tenure track position at a rural institution, researching, teaching, and mentoring students, including nontraditional and marginalized individuals. Similarly, Author 3, a woman

of color engineer in industry, faced various transitions and challenges throughout her career, magnified by her international student status and gender. She experienced being one of the few women of color in engineering classrooms. She also noticed the lack of representation of women in engineering and decided to pursue a Ph.D. in Engineering Education to understand and address this issue. Author 4, also a women of color engineer in academia, faces various transitions and challenges throughout her career, including adapting to new workplace dynamics and navigating her identity as an international student. She recounts experiencing challenges in her new role as a faculty member, including applying theoretical knowledge to real-world problems and adapting to a new cultural and educational environment.

Self: Author 1 faces challenges in technical classes, such as implicit expectations and language barriers, and struggles to find her place in engineering education. She recounts feeling like a "good student" but uncertain about her abilities. Author 1 also noted that she hesitates to speak up due to language ambiguity and fear of not being understood. She avoids physical touch due to religious values and struggles with finding suitable attire for professional events. Author 2 recounts coming from a heavily quantitative background in psychology in India and faced challenges adapting to education. She experienced helplessness and isolation during her Ph.D. and fellowship but is now able to find her footing in engineering education. Author 4 explains how she brings a diverse perspective to her research, teaching, and interactions within the academic community. She values cross-cultural understanding and empathy, and has developed resilience and problem-solving abilities through her experiences as a global educator and engineer.

Support: Author 1 narrates how she receives support from Bangladeshi flatmates and friends and her current advisor, but faces challenges in finding psychological safety and navigating hierarchies in research. Author 2 received mentorship from women and women of color in STEM, who like her, understand microaggressions and support her growth. She expanded her network and took under her wing several women of color and marginalized identities. Author 2 observed how prioritizing her ambition often found herself dealing with microaggressions from male international colleagues. Author 3 also observed the importance of intersectionality, noting from her experience that international men of color can also perpetuate biases against international women of color. Author 3 elaborated how she received support from her doctoral advisor and managers and leaders in industry, who helped her navigate visa-related issues and workplace challenges. Support from her department and colleagues has been crucial in Author 4's success, but she has also had to seek out mentorship and advising from different individuals across departments and institutes. Author 4 explains how her international background influences her approach to topics in the classroom and in her scholarly work, and she believes that being international plays a significant role in her life as an engineering education scholar.

Strategies: As she transitions out of her Ph.D., Author 1 faces uncertainty and limited support, with conflicting advice from peers and mentors. She hopes for a better future but is unsure of what awaits her, especially with visa status limitations. Author 2 focused mainly on self-advocacy, seeking support from women and women of color in STEM, and expanding her collaboration to build squad capital. Author 3's narrative highlighted the importance of culturally inclusive mentorship, building and maintaining supportive networks, and self-advocacy for women engineers navigating academic and professional transitions. Her experiences emphasize the need for understanding and addressing the challenges faced by international students and women of color in STEM fields. Author 4 also elaborates on employing

self-advocacy, seeking support from peers and mentors, and developing problem-solving abilities to navigate challenges. She also emphasizes the importance of cross-cultural understanding and collaboration in addressing complex challenges facing the engineering profession.