

Board 122: Work in Progress: Identity and Positioning of International Students in Sociotechnical Discussions

Jingshu Meng

Hannah Norton

Dr. Chelsea Andrews, Tufts University

Chelsea Andrews is a Research Assistant Professor at Tufts University, at the Center for Engineering Education and Outreach (CEEEO).

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Introduction

Concerns about technocentric undergraduate engineering courses have now become widely disseminated. As a result, universities are working to include more sociotechnical content in formerly purely-technical courses, with the goal of engaging students in recognizing and analyzing the economic, political, and social aspects of technology. In the U.S., many of the focus topics for this sociotechnical content are grounded in a U.S. context, requiring an understanding of the history and current state of racial and economic power structures. While U.S. residents are likely familiar with these structures, it is important to consider how these topics are encountered by international students.

This work-in-progress study on international student experiences is part of a larger NSF-funded research project exploring integrating sociotechnical topics in a first-year engineering computing course [1]. The revised course includes weekly readings followed by small-group discussions on curriculum-aligned real-world justice topics. For example, students read an article on environmental racism that discussed how, contrary to popular belief, environmental pollution correlates more strongly with race than with class. Discussion prompts drew students' attention to the data science implications: how what data is collected and how it is analyzed directly determines what conclusions can be drawn.

This work-in-progress paper develops a case study analysis of post-course interviews of six international students of color. We use a qualitative case study approach to analyze these interviews, focusing on students' expressed identity and experiences with the course, to understand the unique challenges for international students as they navigate sociotechnical class content in the U.S. context.

Theoretical Framework

We draw on the Emergent Framework on Learning Race in the U.S. Context (LRUSC) [2] to organize our analysis and findings. This framework was developed based on small focus groups and individual interviews to understand how foreign-born students of color make sense of racial experiences and racial minority status in the U.S. It presents an evolution through three main categories: *unexamined U.S. racial-ethnic identity*, *moving towards racial-ethnic identity examination in the U.S. context*, and *integrative awareness in the U.S. context* [2, p. 11]. At first, students with unexamined U.S. racial-ethnic identity tend to believe that racism does not affect them. Over time, as the students experience more racial/ethnic encounters, students at first may attempt to “resist racial distractions” but eventually racism catches up to students and they are forced to examine their new identity in the U.S. context. Finally, students that achieve integrative awareness of racial-ethnic identity may commit to actions that lead to social change.

The framework gives a diachronic analysis of how international students develop a growing understanding of their racial/ethnic identity and positioning in the U.S. context. Alongside this framework, we also draw on identity theory, specifically the interaction between identity and self-concept. Identity and self-concept are two closely related but distinct constructs. They are both ever-changing self-constructs influenced by external social factors. However, identity is

externally governed while self-concept is internally governed [3, p. 43]. An identity is “[...] a layering of events of participation and reification by which our experiences and its social interpretation inform each other” [4, p. 286]. Simply put, it is about who we are as individuals in various contexts. For example, one can have multiple identities as a scientist, a mother, an avid reader, etc. Self-concept, on the other hand, is one’s belief or attitudes about oneself [5]. For example, an amateur novelist (identity) might have a self-concept as the greatest writer of the century. Identity and self-concept overlap and influence each other. Involvement in a community can accentuate a certain identity, and one’s attitudes about themselves (self-concept) can lead to behaviors consistent with such an identity. Hence, a freshman international student from Africa who has had almost no involvement in the Black American community is likely to have a self-concept as simply an international student, even though their identity has changed from a person of a predominant racial/ethnic group (in their home country) into a racial minority (in the U.S.). Then, as they go through more racialized interactions in local communities, they might slowly gain insights into the racial-ethnic realities in the U.S. context and begin aligning their self-concept with their racial/ethnic identity. Then, if they achieve integrative awareness, they may use their racial identity as a motivation to thrive.

Data Collection and Analysis

In this work-in-progress study, we draw from interviews conducted in the summer just after the conclusion of the redesigned computation course. All 192 students who took the course were invited to participate in interviews; 21 responded to the invitation and were interviewed. Of these 21 students, 7 were white, 6 were students of color who were also international students, and 8 were students of color who were not international (not all of these students identified as American, but they were not officially designated as international students). Interviews were conducted by undergraduate and graduate summer interns, including the first two authors. The approximately hour-long interviews were semi-structured and asked the students to describe their experience in the course, their thoughts about the sociotechnical content of the course, and what advice they would give to future students.

Interviews were transcribed from the video recordings. The summer research group (4 undergraduate and 1 graduate student interns, supervised by the third author) began analyzing the interviews as a whole to identify potential research threads. The first two authors noticed interesting trends in the six interviews featuring international students of color and decided to take a qualitative case study approach [6] to investigate these students’ experiences. With an eye towards identity [3], the first two authors analyzed all six interviews with international students of color (Table 1). Drawing on the LRUSC framework, we considered how the students’ responses fell along the spectrum from unexamined identity to integrative awareness. There was no attempt or intention to engage in formal coding processes; rather, we used the framework to deepen our understanding of the students’ responses. We were not interested in locating individual students within the framework, but instead considered responses to interview questions individually. As a result, different responses from the same students sometimes fell into different categories.

Positionality. The first author, Jingshu Meng, is a female Chinese international graduate student in philosophy with a background in computer science and math. The second author, Hannah Norton, is a nonbinary human factors engineering undergraduate student and a member of the

First Nations Mohawk Tribe. The third author, Chelsea Andrews, is a female white American faculty member in engineering education who mentored the first authors.

Table 1. Pseudonym and self-reported demographic information for students in this study

Pseudonym	Gender	Self-reported race/ethnicity	Class year	Major
Aizere	W	Latinx, Central Asian	1st year	Mechanical engineering
Richard	M	Multi-racial, Afro-Caribbean	1st year	Electrical engineering
Ebo	M	African	1st year	Electrical engineering
Henry	M	African American	2nd year	Computer engineering
Mulubwa	W	African American	1st year	Chemical engineering
Doug	M	East Asian	1st year	Computer science engineering

Findings

We organize our findings according to the three categories of the LRUSC framework: (1) *unexamined U.S. racial-ethnic identity*, (2) *moving towards racial-ethnic identity examination in the U.S. context*, and (3) *integrative awareness in the U.S. context*.

1: Unexamined U.S. racial-ethnic identity. In this stage, students view sociotechnical topics through a disconnected lens, as they do not feel involved in the U.S. context of racial issues.

Missing U.S. context in discussion. Many of the international students of color stated they found themselves disconnected from the in-class sociotechnical discussions because they felt as if they were missing information that the readings could not provide. Mulubwa (African) had to go to office hours more than he anticipated because he felt that he was “completely lost” in the discussions. Some students, like Ebo (African), felt uncomfortable because he felt he was expected to have experience with racism, but could not add to discussion. Doug (East Asian) discussed how he was pleasantly surprised to find how people cared more about social issues in the U.S., but felt like he needed to put his efforts into performing more with the technical side of the course because he was missing context for the social aspects.

Disinterest in discussion about race. When participating in the discussions, Aizere (Central Asian) found herself questioning why American people cared so much about topics on racism. She said she was more interested in the technical portion of the class. When asked about her interest in the topics, she explained “if it's about racism then I don't have any background or I'm not really interested in it.” Another student, Richard (multi-racial, Afro-Caribbean), also expressed how he was not interested in the U.S. context, but rather wanted to diversify the topics.

Strictly expressed identity through an international context. One of the interview questions was, “what advice would you give to a student looking to take this course, and would it be different if it was a student of color?” When answering this question, Ebo said that he does not think that his advice would be different to a white student or student of color, but rather it would be different for an international student. He said that his international student identity is what he understands, so he would only speak through that context.

2: moving towards racial-ethnic identity examination in the U.S. context. After some period of time, international students tend to start evolving their identities to fit into the U.S. context. In the interviews, students often reflected on a catalyst that required them to consider how their identity fits in the U.S. context.

Positioning themselves within the perspective of the identity that they are perceived as. During class discussions, international students sometimes found it necessary to imagine the perspectives of a U.S. student of color, as they personally lacked experiences in the U.S. context. In order for Mulubwa to gain interest in the topics and immerse himself in the context, he said that he “had to put [himself] in the shoes of a black American.” As an African student from Kenya, he felt that he needed to imagine a different identity in order to understand the discussions. Richard felt similarly, that he needed to do more work to understand the content and context. He stated that some of this work consisted of analyzing “the different perspectives inside the articles and of the whole political climate.”

3: Integrative awareness. In this stage, students can understand their racial experiences within the U.S. context. Because this course is taken by primarily first year students, many of the international students have lived in the U.S. for under a year, and therefore do not have much experience with the context. Across the six international students of color, only one student’s interview responses corresponded to this stage. This student was a second year student, but had been in the U.S. for two years before college; we suspect that due to these additional years of experience, he has started to understand how he is perceived in U.S. society.

Increased awareness of U.S. racial disparities; emphasizing their different experiences. Henry (African) had attended school in the U.S. for three years (including two years of high school), and had started to understand the structure of race and the racial disparities in the systems that the course analyzed. Henry said that he could understand how the course might be difficult for a first year international student because they may “not have the same experiences when it comes to racism as the U.S. students in the class.” This dual-understanding of where he once was, and where he positions himself now, was also demonstrated in how he felt positioned by other students in the course to fit a certain narrative. For example, Henry recalled his experience in discussion groups:

[...] sometimes when you are talking about some topics to do with like racial disparities, especially like these small groups, like I feel like whenever people talk about racism, or they voice those topics, they'll always glance at me to seek for some sort of approval [...]. My opinions should not automatically be assumed to be right, just because I am a student of color. I feel like I should just be given the opportunity to voice out my opinions, the same way that other people have the opportunity to voice their opinions, because at the end of the day, we all have different [...] experiences and especially someone like me, who is from a very different background, and I've not experienced most of the things that Americans have experienced—like people of color in the US have experienced—like totally different in some ways. And I may not have the exact same experiences as them, but something that's really hard to avoid because when you're talking about how black people are affected these days and in the U.S.

In this quote, Henry describes how other students in the course “always glance at me to seek for some sort of approval” when discussing topics that included racial disparities, positioning Henry as an authority in these discussions. Henry did not believe his opinions should be treated differently than those of other students, in particular because he has not experienced “most of the things...people of color in the US have experienced.” When questioned by the interviewer, he said he did not feel uncomfortable by this positioning because he was able to see the perspective of the students looking at him. He utilized his experience in the U.S. in order to understand how he is perceived, even though he knows that his background of being an international student affects his understanding of the situations.

Conclusion

This qualitative case study analysis of international students’ of color experiences in sociotechnical discussions in a first year computing course is a first step in understanding the unique perspectives of this population. The six international students of color interviewed report feeling unprepared for the sociotechnical discussions as they lacked a complete understanding of the U.S. context. Some students also expressed explicit disinterest in the topics that centered around U.S. issues and recommended adding international topics to the course. For all of the students, even the one who had been in the U.S. the longest, their international identity was stronger than their racial identity. This seems to be at odds with how the other students in the class positioned these international students of color—as experts in racial issues. These findings have implications for the design and facilitation of sociotechnical content in engineering coursework, both in terms of creating scaffolds for students new to the U.S. and motivation to create content focusing on international contexts. In future work, we plan to focus on how international students of color are positioned by other students and how instructors can work to disrupt these dynamics and support all students in engaging in more careful classroom interactions.

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