

Asian Identity in the Online Classroom

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Abstract

During the coronavirus (COVID-19) pandemic, Asian American students in higher education were faced not only with the move to online learning but the nuances that came with anti-Asian rhetoric and violence in the news. We wanted to understand how the sociopolitical effects of the past two years have affected Asian American engineering students through their experiences in the online setting, as well as highlight the gaps of Asian American engineering students in engineering education research.

Using qualitative methods through semi-structured interviews with Asian and Asian American engineering students, we explore Asian and Asian American identity, and sociopolitical matters in the engineering classroom. To understand the views of Asian and Asian American students, we lay out the ways that racial and ethnic identity have been examined in engineering, along with Asian and Asian American identity formation. In this paper, we explore the background of race and equality in engineering and engineering education. Then we look at the results of our interviews, focusing on two main areas. First we look at how students formed social networks and build their identities in these online spaces. Then we look at the role of politicization in the classroom and in engineering and how it relates to Asian identity formation. We close this paper by speculating how Asian and Asian American identity can be better addressed and attended to within engineering education.

Introduction

In March of 2020, students worldwide stopped attending in-person classes at universities and colleges due to health concerns related to the 2020 coronavirus (COVID-19) pandemic. As a result, online learning became the primary mode of education regardless of education level. At the college level, classes became available online both synchronously and asynchronously to meet student needs in different locations and time zones. Due to the health concerns regarding in-person class meetings, in-person labs and studios migrated online [1]. The sudden move to online learning placed students at a disadvantage due to the lack of space and resources that being on campus provides.

Along with the COVID-19 pandemic, Asians and Asian Americans began to experience increased xenophobia and prejudice due to the connections of COVID-19 to China. So not only were Asian and Asian American students faced with the problem of increased xenophobia and prejudice, but they also had to return to their homes. Taken away from the spaces where they may have the freedom to strengthen their cultural and ethnic identities with other students, we wanted to see what was occurring during online learning.

This research project considers two major factors when analyzing the role of Asian Americans in engineering during COVID-19. First, specifically for Asian and Asian American students, the online space became a virtual space where students could interact and connect with student groups where their racial and ethnic identity could develop. The second and last observation was that Asian and Asian American engineering students were disengaged with matters relating to political and social activism during the pandemic, even after the violence against Asians gained traction in the mainstream media [2], [3], [4], [5] and the aftermath of the 2021 Atlanta Spa Shooting where 6 of the 8 victims murdered were Asian women [6], [7].

With 14.9% of bachelor's engineering degrees awarded to Asian and Asian Americans in 2020, Asian Americans make up the second-largest racial group behind white students in the realm of engineering. Thus, there should be some attention to what is going on in the Asian American sphere of engineering education. With these students facing a global pandemic, hate, and xenophobia, how have Asian American engineering students managed during the move to online learning during COVID-19?

In this paper, we explore the background of race and equality in engineering and engineering education. Then we look at the results of our interviews, focusing on two main areas. First we look at how students formed social networks and build their identities in these online spaces. Then we look at the role of politicization in the classroom and in engineering and how it relates to Asian identity formation. We close this paper by speculating how Asian and Asian American identity can be better addressed and attended to within engineering education.

Positionality of Lead Author

As a engineering education researcher with a background in Science and Technology Studies, the lead author brings her own critical reflexivity as a social scientist and an engineer to understand the structures in place within engineering. Her experiences as a biracial - Asian and white - woman have led her to explore what it means to identify as Asian, as multiracial, and as a woman in engineering. In her experiences, matters of racial and ethnic identity were not consistently recognized nor welcomed. The lead author recognizes her perspectives and uses situational analysis as a mode for unpacking the nature of this project.

Identity in Engineering Education

The field of science, technology, engineering, and math (STEM) is perceived to be a means to upward social and economic mobility in the US [8]. Thus it is essential to understand the barriers or pathways to engineering for various ethnic and racial groups in the US. Multiple identities come together and intertwine with one's engineering identity. In a literature review on

engineering identity, researchers found that little attention to race and ethnicity was brought to engineering identity theories [9].

For instance, gender is a common identity studied in relation to race and ethnicity in engineering. Research has shown that attention is needed to understand the relationship between gender and ethnic identity for inclusion in engineering and queer and trans students of color in STEM [10], [11], [12], [13]. The MIDFIELD data project found that racial and gender differences were more likely to predict persistence within engineering than institutional differences [14]. Especially women who matriculated in engineering tended to persist in engineering, compared to men, except for female Native Americans [15]. And while women are less likely to enter science and engineering fields, they are more likely to do well [16].

However, we want to shift our focus to racial and ethnic identity. Racial identity has been a topic commonly discussed in conjunction with engineering identity and engineering education. Camacho and Lord have studied how Hispanic Serving Institutions should focus on recruiting Latina engineers over retention because these students face challenges getting into rather than staying in engineering programs [17]. For Black students, institutional structures have created barriers to engineering, reinforcing anti-Blackness in engineering [10], [18], [19]. It is important to recognize and discuss matters of race and ethnicity in relation to engineering as perception of inclusion is strongly connected to students' mental health and persistence in engineering [20].

While there have been studies about various minority groups, Asian and Asian Americans in engineering have not been heavily studied despite being the second-largest racial and ethnic group within engineering. As mentioned earlier, with Asian and Asian American students making up 14.9% of bachelor's engineering degrees, we wanted to understand some of the dynamics relating Asian and Asian American students to engineering. However, we were surprised by how little research was on Asian and Asian American students in engineering education research.

Of the research conducted, racial inequality still exists among Asian American students even when they are the overrepresented population in engineering [21], [22]. However, underrepresented Asian American students in STEM are rendered invisible due to stereotypes of Asian and Asian Americans such as the forever foreigner, foreigner-within, and the model minority myth [22], [23], [24]. Particularly the model minority myth takes the view that Asian and Asian American students are smarter and hard working compared to other minority groups [22]. Especially in the context of STEM and engineering, the model minority myth is harmful for students. While research highlights how race plays into persistence in engineering, there is little about the intersection of Asian identity and engineering identity development. In regards to engineering industry, Asian engineers struggle in upward social mobility compared to Caucasians, particularly foreign-born Asian engineers residing in the US [25]. As the Asian

population is commonly not perceived as a minority within engineering, we want to explore how engineering identity impacts Asian identity. Thus, we look to identity development stemming from Asian American Studies to understand the role of Asian identity in engineering.

Asian American Identity Development

In the field of Asian American Studies, there have been several attempts to create identity development theories specifically for Asian Americans. Chan focused on identity development at the intersections of Asian American identity and queer identity [26]. Ibrahim, Ohnishi, and Singh Sandhu focused explicitly on the South Asian American identity of both immigrants and American-born individuals [27]. With regards to Asian American transracial adoptee identity development, the nuances of other various identities become highlighted [28], [29], [30]. And to better understand Asian, Pacific Islander, and Desi American college students as a population, an exploration of their racial identity development can help to understand how they navigate the dynamics required in college and society [31]. Though there are various theories related to Asian American identity formation, we focus on the Asian American Racial Identity Development Theory for this paper [32].

The Asian American Racial Identity Development Theory, posed by Kim, heavily links the intersection of one's educational journey with their social journey. This theory is heavily linked to one's educational and social journey. Posed by Kim [33], there are five stages of identity development for Asian Americans. As this theory strongly connects racial and ethnic identity to education, we focus on this model in relation to engineering students. Below is a summary of the five stages, Ethnic Awareness, White Identification, Awakening to Social Political Consciousness, Redirection to Asian American Consciousness, and Incorporation that encompass the Asian American Racial Identity Development.

1. *Ethnic Awareness Stage*: In this stage, the family is the most significant ethnic group model. This stage forms in early childhood, and negative to positive attitudes towards ethnic expression form [32], [33].
2. *White Identification Stage*: With a new social environment in the school and exposure to white society, they become aware of a clear difference from their peers. Negative encounters such as racial prejudices arise, which negatively impact self-esteem and identity. These experiences lead to a desire to identify with white society, internally distancing themselves from Asian identity [32], [33].
3. *Awakening to Social Political Consciousness Stage*: Considered the most crucial stage, here is when the subject gains a new perspective as a minority in society. Kim specifically cites that political involvement includes a wide range, from taking courses about Asian American topics to attending demonstrations and working with their

community. The subject takes time to learn about oppression and oppressed groups when the opportunity arises [32], [33].

4. *Redirection to Asian American Consciousness Stage:* While the subject begins to identify as a minority in the last stage, it is at this stage that the subject reconnects to their Asian American heritage and culture. They become immersed in Asian American experiences and positive self-esteem allows them to understand themselves better [32], [33].
5. *Incorporation Stage:* The apex of Asian American identity formation, they are comfortable in their identity as Asian Americans. They can relate to other groups and gain respect for other races, cultures, and ethnicities. The negative sentiments against white society no longer are a block for the subject [32], [33].

Going into the interviews, we expected our participants to be somewhere around stage 3 or 4 due to the strong connections to independence and autonomy found in the college setting. From a critical Science and Technology Studies (STS) perspective, we also expected there to be high levels of activist engagement among the students due to events such as racism related to COVID-19, the Atlanta Spa Shooting, and Black Lives Matter movement. Furthermore, with the increase in political consciousness as proposed by Kim, I turn to the potential for these students to become more politically engaged at their universities. We hoped that these students would be more engaged in political awareness and activism in their respective universities. Were Asian American engineering students engaged in sociopolitical awareness in the engineering classroom?

Online Learning During COVID-19

Before diving into the research analysis, we must acknowledge that emergency remote teaching is what these interviews describe. In the scope of general education, including higher education, there is a mistaken idea to think of shifting courses strictly online during COVID-19 as forms of online or distance learning. However, there is one large caveat to this thinking. In the case of distance or online learning, students have the ability to choose whether to take courses in the online format or in-person. This was not the case in regards to COVID-19. With COVID-19, students and faculty were forced by their institutions and administrations to switch to online learning for safety and health concerns. Campus facilities, classrooms, labs, and studios were closed to reinforce social distancing requirements to safeguard public health. Education scholars have referred to this phenomenon as “emergency remote teaching” or ERT [1]. ERT encompasses any form of alternative teaching methods used during a crisis, pandemic, or other situations that could bring medical/physical harm to students or faculty. While ERT has been implemented in various cases around the world prior to COVID-19, it began to make headway in education studies due to the pandemic [1].

In order for ERT to be carried out in the 21st century, forms of digital technologies such as access to the internet and computers or laptops, and webcams or microphones are needed by both faculty and students. Here we see how the role of technology in moving to ERT online created barriers. The name itself, “online learning,” reiterates the fact that whoever is in the act of learning or in the role of teaching, must have access and the capabilities to be “online,” or the virtual space. When away from campus, students may not have equal access to the technologies and infrastructures needed to successfully complete online learning. In a study on engineering education conducted online due to COVID-19, both student and faculty respondents referred to the multiple challenges related to technology access, citing how not all students and faculty had access to the internet, webcams, or even a computer [34].

Methods

This project was designed to understand the effects of various learning technologies utilized in engineering education, focusing on online learning during COVID-19. Digital ethnographic methods narrowing in on semi-structured interviews were central to understanding how students navigated online learning and identity during COVID-19.

We had two research questions we wanted to answer from this study:

1. How do students understand and form their Asian American identity?
2. Were students engaged in sociopolitical awareness in the engineering classroom?

The following criteria were used to narrow down potential interviewees for this study. First, the student had to identify as an Asian or Asian American engineering student attending a US college or university. According to the 2020 Total by the Numbers report released by the American Society for Engineering Education, Asian American engineering students made up 14.9% of bachelor’s engineering degrees awarded in 2020 [35]. While overrepresented in engineering, Asian and Asian American students and underrepresented in the research and literature within engineering education research. With Asian Americans as the second-largest racial and ethnic group in engineering, I wanted to center my research on this group, especially since there is a paucity of research related to specifically Asian American engineering students.

Second, the student must have taken at least one engineering course during the COVID-19 pandemic. This time narrows down from February 2020 to August 2021. Students were engaged in online or hybrid classes during the time period, where some portions of the class occurred both online and in-person. Third, students had to have access to the internet. As COVID-19 and campus access were restricted or not allowed, interviews were hosted online through platforms such as Discord, Google Meets, Zoom, and WebEx in order to allow a larger range of student participation. Interviewing students online allowed the researcher to interact with a wide variety

of students from across the US in a short amount of time. This also gave students flexibility and more comfort in interacting with the researcher.

Engineering students involved in various ethnic clubs, organizations, sororities, and fraternities were approached via social media such as Discord, Facebook, and Instagram to participate in our research. Discord was particularly important to this project, as the application functioned as a space that hosts instant messaging, video and audio calls, and digital distribution of files. In Discord, users join servers that host micro-communities that can only be joined through a verification process based on invitations to join the server. The researcher had access to various universities and university organizations through invitations to the various Discord servers. All interviews were conducted online via Discord and Google Meets. Interviews were recorded and transcribed, then coded for analysis.

Overall, 43 semi-structured interviews were conducted. Of the students who participated, we had 22 female and 21 male engineering students. Asian ethnic identity consisted of Chinese (19), Korean (3), Japanese (1), Taiwanese (1), Bangladeshi (1), Indian (7), Filipinx (6), Indonesian (2), Vietnamese (3), Cambodian (1), Laotian (1), and Kazakh (1). Of the population studied, two students identified as multiracial, meaning they identify as more than one racial category, such as being both Asian and White, and three were adoptees, all of whom were adopted by white parents. (A further discussion on the ethnic and racial importance in the Asian Identity section).

There was a broad survey of engineering students, including six double majors and one triple major. During the summer of 2021, nine rising sophomores, ten rising juniors, fifteen rising seniors, and nine graduates were interviewed. Engineering majors represented included aerospace (3), biomedical (5), chemical (8), civil (2), computer (6), electrical (2), environmental (2), industrial (6), mechanical (10), nuclear (1), and undeclared engineering (1).

To protect student identities, the only identifying information included with quotes throughout this paper will be their Asian ethnic identity, gender identity, year, and major. For example, [-Indian, female, junior, mechanical engineering] signifies that the interviewee was a rising junior, at the time of the interview, who identifies as a female Indian studying mechanical engineering in the US. Quotes included in this paper have identifying information such as university names, courses, or departments, removed which are then generalized within brackets []. Quotes have been approved for use by the interviewed students.

Forming Asian American Identity

College tends to be a period of time where identity formation occurs away from the eyes and ears of family. In these cases, it is common for students to rediscover, define, and form their new

identities or strengthen commitments to the ones they already have [36], [37]. For Asian American students, college may be a time where they interact with other Asian Americans for prolonged time. And in doing so, this allows for them to learn more about where their heritage and where they come from. For instance, these interviews were conducted through a nationwide Asian American group that supports the cultural and professional development of Asian American STEM students.

The term “Asian American”, first coined by activist Yuji Ichioka, aimed to bridge together the various ethnic groups who had migrated to the US from the Asian continent [38]. And while the term does bring together these people, it indicates a more significant presence of identities. Asian American encompass many ethnic identities including East Asian (Korea, Japan, and China), South East (Philippines, Hmong, Vietnam), South (India), and more. While the perceived success of East Asian Americans is mapped onto the entire population of Asian Americans, it only highlights East Asian American students, leaving other Asian American students at a disadvantage. This sets up a frame of Asian Americans as the villain of other minority groups because they have achieved a perceived equality with white Americans, which is not the case. Therefore, it feeds into the rhetoric of the model minority myth that Asian Americans struggle with in terms of representation and acceptance in STEM higher education from a student and faculty standpoint [39]. Students indicated these sentiments in reference to their Asian American identity:

[W]here I grew up there was a lot of pressure for us to be your perfect Asian kid at a super competitive high school. It either went two ways. After high school, it either went that parents loosened up on them and they were able to just do their own thing in college, which was more or less my situation – but I’ve also had friends that came back to their parents and stayed home. Now they’re much more stressed out than they were at college, and they didn’t really have the freedom to get involved. Well, they were still able to get involved with organizations and clubs but there was always that pressure of the parents just being behind them, and trying to redo what they were doing in high school, now with their college kid at home.

- Chinese and Indonesian, female, senior, chemical engineering

[Y]ou know how Asian Americans grow up and they’re like your parents and family “but you need to be a nurse, you need to be a doctor” and it’s kind of like sometimes you feel a little secluded.

-Filipina, female, class of 2020, chemical engineering

I have to associate my racial identity, sharing in terms of “you got to be a doctor, lawyer, engineer basics. We have to have some sort of “smart” position or something, definitely associated with some of my friends. I want to do something creative, I want to do design. I want to make something that will help people, like medical devices.

- Indian, male, junior, biomedical engineering

College tends to be a period of time where identity formation occurs away from the eyes and ears of family. In these cases, it is common for students to form new identities or strengthen the ones they already have. For Asian American students, college may be a time where they interact with other Asian Americans for the first time and explore their heritage and culture. Most of this development occurs in extracurricular clubs and organizations. For instance, these interviews were conducted through a nationwide Asian American group that supports the cultural and professional development of Asian American STEM students. Though students indicated that online learning was difficult and challenging, there were some aspects of the online presence that allowed for greater engagement in these clubs and organizations. One club's president described managing online accounts and hosting club events when things were required to be online:

...for a club, not everyone wants to go back online because everybody's already online for classes. It's a different vibe or atmosphere because there's only so much you could do online. It feels like another class...you don't want to go online again, in another Zoom meeting, just for a club. So we used other platforms. We tried to use Discord to have a movie night. Then we opened up our own Discord server so people could work together. We did a movie night and online gaming night. There were still some events that we were able to hold like our alumni night. If anything, it was probably more helpful that it [alumni night] was online because people who couldn't attend in-person are able to attend online.

- Filipina, female, class of 2020, chemical engineering

The Discord platform was not only utilized for student clubs and organizations, but also for study groups online. Importantly, these were all student initiatives formed from clubs and organizations, not from the universities themselves:

...student wise, a lot of my classmates, peers and I, we made Discord servers for the courses to use. That was extremely useful.

-Indian, female, senior, electrical engineering and computer engineering

I actually set up a server for my other peers to study in with Discord myself, but that was a student initiative.

- Chinese and Indonesian, female, senior, chemical engineering

Outside of the online clubs and organizations, defining Asian American was something that students struggled to define, even though they had a clear understanding of the term. Coming to a singular conclusion proved difficult and at times jarring for students:

really broad....Asia is a big continent so personally it feels very difficult for me to identify as Asian American. I would rather identify as a Japanese American or Japanese.

-Japanese, male, senior, biomedical engineering

Honestly, I'm not a huge fan of the term, it's weird. I think Asian American is too broad considering how diverse the cultures are within the Asian continent. [T]he experiences that I have as a South Asian person are very different from those that someone from Japan might have, right?

Just because a lot of experiences in this [US] country are based on skin color to a certain extent. And I'm brown so my skin, the experiences I've had with our racism are gonna be different, different types of racism in that regard. -Indian male, sophomore, chemical engineering

Asian American goes for anything from east oriental Asian to the [Pacific] Islander to Indian. -Chinese, male, junior, mechanical engineering

...there's no one definition of being Asian American. -Indonesian, male, class of 2021, industrial engineering

These last quotes highlight a larger problem that comes with the classification of Asian American. In some cases, like the student above, Pacific Islanders are lumped into the category of Asian American. But according to ASEE data and other definitions, Pacific Islander or Native Hawaiian are categorized as Asian Americans, thus excluding them from “underrepresented minorities [35].” In most cases, when referring to Asian American, there is a large emphasis on East Asian ethnicities and identities. This leaves out Indians, Southeast Asian (i.e. Hmong, Thai, Vietnamese, Filipino) central Asian (i.e. Kazakh, Kyrgyz, Uyghur, and Uzbek) and western Asian (i.e. Iranian, Turkish, Iraqi, and Syrian) identities, seen in the raw data. If we do not pay attention to all Asian American identities, we risk leaving out the underrepresented populations within the Asian American community.

Sociopolitical Disengagement or Political Neutrality?

The field of engineering has attempted to take the side of neutrality in relation to sociopolitical topics. Yet, the structures of engineering education do not allow for discussions of the sociopolitical nature [13], [40]. Even the inclusion of diversity statements on syllabi and hiring application for faculty are coming under question [41]. While interventions have tried to bring in the politics to engineering, it has proven difficult to stick [42]. Cech's research on the effects of engineering curricula on student outcomes notes how engineering education reinforces a “culture of disengagement” where students no longer find interest in matters of public welfare [43], [44]. Interestingly enough, from Cech's study the only significant racial difference was related to Asian and Asian American students: “Asian and Asian American students' values on understanding the consequences of technology and understanding how people use machines drop marginally more than white students' beliefs” [43]. This finding indicates that Asian and Asian American engineering students, compared to other engineering students, are unlikely to value nuanced competencies, like the reproduction of power imbalances among people, regarding the social implication of technology.

Together with Kim's Asian American Racial Identity Development Theory, there is a conflict regarding if or when sociopolitical consciousness comes into play [32]. Were these students more attuned to their engineering peers and distanced from sociopolitical matters? Or were they

reaching the later stages of Awakening to Social Political Consciousness Stage, Redirection to Asian American Consciousness Stage, or Incorporation Stage, as Kim proposes? As each students' own identity development is at different stages, we will not attempt to categorize the exact stage of each quoted student.

Students were asked if their engineering professors discussed topics about racial movements and inequity, particularly the Black Lives Matter and Stop Asian Hate movements, as these two were the most salient at the time of the interviews. Most of the students did not have professors mention these or take time out of class to discuss these topics. The student responses came into one of two camps. On the one hand, students understood the sensitivity of these topics in the classroom and campus:

For the most part our professors try to avoid situations like that [Asian Hate and Black Lives Matter movements] and conversations like that because there are quite a few conservative students that go to our school because [state] itself is fairly conservative, and it also being predominantly white makes it more conservative. There are vocal supporters and stuff that go here and so our professors definitely wanted to stay away from conversations like those.

-Indian, female, junior, electrical engineering

Yet, students also indicated they wanted a separation from politics in engineering. Research has shown that in comparison to US-born Asian students, foreign-born Asian students were more likely to indicate an indifference to the Black Lives Matter movement [45]. While this was not a factor we aimed to look at, this trajectory was similar to our participants. Students born in the US were more vocal about these topics compared to foreign-born students. They understood the stance that many of their professors took in order to keep the barriers up between the technical engineering classroom and the sociopolitical events that were happening in the world:

I feel like it would have broken the teacher-student relationship, which is a bit odd, but I feel like having that barrier definitely helps just to learn from them and separating real life at school especially when it gets crazy out there.

-Indian, male, junior, industrial engineering

[A] lot of professors choose not to become political, which is a good thing. It doesn't cause any unnecessary conflicts or issues that might arise. It sucks that they don't talk about it and they don't show support for things that we all as human beings probably know is right or wrong, and that they don't stand up for it but it's understandable, they represent the university. But outside of class, there were a good bit of professors that I happen to be engaged with that showed a lot of sympathy and empathy towards these subjects and topics and it was very heartwarming and very supportive of them.

-Korean, male, senior, aerospace engineering

In the last quote, the student showcases the importance and impact of empathy from professors, however it is not expected or seen from all professors. This indicates that in choosing to stay silent on these topics, professors are not staying neutral but, in fact, showing an indirect

indication of their stance. In staying silent, these professors tacitly reinforce engineering as a culture of disengagement [32]. If we do not highlight the importance of the role that professors take on shaping our future engineers, we run the risk of perpetuating the same ideas within engineering over and over again.

Conclusion

In future studies, we hope that researchers consider the importance of Asian American identity in engineering and how the Asian American identity is not a stereotype of the model minority, but that the Asian American identity encompasses many different Asian ethnicities. COVID-19 and online learning were just some of the barriers that Asian American engineering students navigated from 2020 to now. So as engineering educators, how do we address issues related to race and sociopolitical matters in the classroom? Do we continue to feed into the engineering culture of disengagement or reinforce the progress of Asian American sociopolitical development? If we do not consider ethnic and racial identity important in developing and shaping future engineers, we perpetuate the structures that continue to stay in place.

Limitations

Student narratives included in this project were limited to students who fit our criteria mentioned in the Methods section and have access to the internet and online social media accounts. Due to COVID-19 regulations, all interviews occurred online over Discord or Google Meets. As a result, interviewees must have had access to the internet and either Discord or a Google account.

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