Online Engagement and Outreach Activities in an ASEE Student Chapter During Turbulent Times

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Quay is a Ph.D. candidate at Stanford University in Civil and Environmental Engineering, and president of its ASEE chapter. Their favorite chapter ASEE event in 2020 was "Culture of Disengagement in Engineering Education?" with Dr. Khalid Kadir (UC Berkeley), which had strong turnout, lively discussion and strongly resonating perspectives for environmental engineers.

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Callan is a Ph.D. student at Stanford in Bioengineering, and financial officer of the chapter. Her favorite part of the ASEE chapter is that it offers a great platform to meet other grad students, postdocs, and faculty members that share a passion for equitable, inclusive engineering education.

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Abstract

Following the shelter-in-place guidelines enacted across California in the early spring of 2020, many institutions transitioned nearly all student programming to online offerings. On the heels of the burgeoning public health challenge followed a long overdue reckoning with systemic and racial inequity catalyzed by George Floyd's murder. In response, our ASEE Student Chapter made major pivots in its mission to address both (A) the pressures and stressors students and educators faced coupled with their desire for engagement and (B) the integration of anti-racist pedagogy into their engineering education practices. In this paper, we will discuss the major components of these pivots, including (i) transitioning existing programming to the virtual environment, (ii) reassessing chapter direction and goals by expert elicitation to evaluate chapter niche, (iii) developing new strategies to increase participation and engagement, including the formation of an anti-racism multimedia learning club aimed at promoting awareness of systemic inequity and discussing strategies to combat anti-black racism in higher education, and (iv) continuously adjusting chapter goals and activities through iterative reflection. We will place this discussion in the context of literature on mental health, well-being, and flourishing of students and educators during this unprecedented time.

Introduction

Prior to COVID, our student chapter at a medium private non-profit university in California supported a small but dedicated community. This group consisted primarily of graduate students interested in engineering education from various departments but also included postdocs, lecturers, and staff members. We held two monthly series of events: (i) "breakfast chats" consisting of a presentation by an expert in engineering education research and (ii) smaller, more targeted journal clubs for discussions of new topics in STEM education. Every spring, we also held a day-long symposium for a deep dive into one theme.

In March 2020, California enacted shelter-in-place orders in response to the growing numbers of COVID-19 cases in the United States. As a result, universities throughout the state and across the country quickly pivoted to virtual learning and work: Faculty scrambled to transition their courses online, undergraduate students grappled with both new course formats and a transition in their living situations, and graduate students and postdoctoral scholars struggled to find ways to save their ongoing research or transition to remote work. These sudden transitions, coupled with a lack of social interaction and issues such as financial strain and family illness, had a severe impact on student, faculty, and staff well-being. These challenges were amplified by a long-overdue national reckoning with racial inequity and injustice after the May 2020 murder of George Floyd. In our university community, the combination of these factors translated to declining levels of engagement with our student, staff, and faculty members.

As a combined result of stressors surrounding COVID-19 and racial injustice, many graduate students suffered a decline in their well-being as levels of anxiety, depression, and PTSD

symptoms rose [1]. While research on the impact of extracurricular involvement on graduate student well-being is limited, studies of undergraduate students have demonstrated that student group and extracurricular involvement is associated with increased well-being and belonging [2]. A few small-scale qualitative studies on graduate students have demonstrated that extracurricular involvement can enable graduate students to network, socialize, and connect with their community [3, 4]. As classes moved online in response to shelter-in-place orders, many students were concerned about their ability to maintain friendships and interact with their community [5]. As a student-majority group, we wanted to ensure that we could continue to engage and support our community despite the transition online.

A growing collection of literature aims to address the transition to online learning and the impacts of COVID-19 and the racial justice movement on higher education. However, relatively few papers or resources have addressed operations of student groups during COVID-19 or provided guidance on how to transition student groups online. The limited resources that are available tend to be geared towards staff members who support undergraduate student groups [6]. Similarly, few resources address the response of student groups to the national reckoning with racial injustice. As higher education grapples with both the implications of systemic racial inequity and the long-term effects of the COVID-19 pandemic, we feel that, as a student group, we have a role and a unique opportunity to revise and improve our institutions to create a culture where all students can have equitable opportunities, achieve, and feel they belong.

To that end, our student ASEE chapter strove to respond to the challenges of this turbulent year by reflecting on ourselves as individuals, on the culture and values of our chapter, and on how we can act on our values to impact the university more broadly by connecting with our community and beyond. By outlining our response to the COVID-19 pandemic and the reckoning with racial injustice, we hope to provide resources and encouragement for other chapters or student groups looking to do the same.

Chapter 1: Transitioning to a virtual environment (March 2020-June 2020)

The initial transition to an online format was smooth -- participants had already asked us to include a Zoom component to our events in previous months, so we were fairly familiar with the software and had experience coordinating an online component to our events. We were no longer able to provide attendees with food, but despite that fact, the number of RSVPs and attending participants remained fairly consistent in March, April, May, and June. Although there was some variability in attendance through the spring quarter depending on the topic, we observed an 100% RSVP-to-turnout rate for events for which the attending number was documented, and even a spike in attendance in May (Fig. 1). Notably, we were able to comfortably accommodate remote attendees, and were pleased to welcome many chapter alumni who otherwise could not attend. We were excited by that change, and hoped to harness this opportunity to increase our participant levels beyond what we would be able to hold from just in-person events.

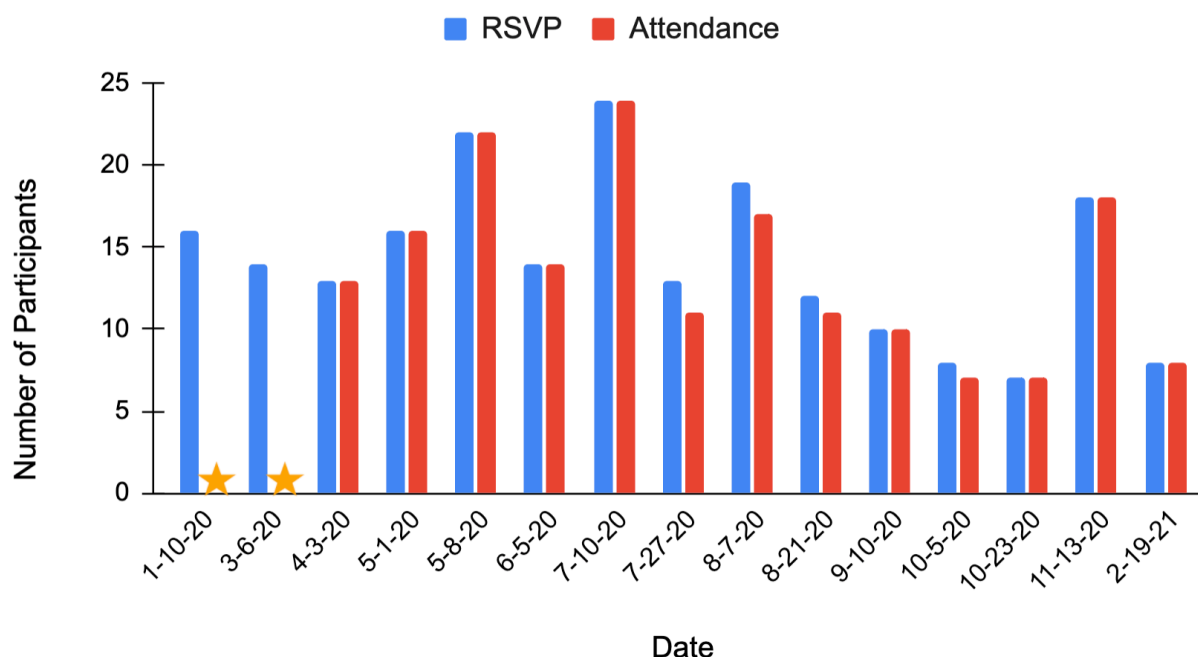## ASEE Chapter Event RSVPs and Attendance Count

Figure 1: ASEE chapter events' RSVP and Attendance Count, January 2020 - February 2021. *RSVP count (blue) and number of attending participants (red) during our spring quarter events. January and March events were in person and attendance was not recorded (orange star).*

Our biggest challenge following the shelter-in-place orders was to adjust a larger event originally planned for April: a half-day symposium entitled "Teaching to Engage the Multi-Perspective Classroom", centered around themes of diversity, equity, and inclusion. Our planned format consisted of 2 talks followed by a lightning talk session with 4 speakers that would segue into a panel. It was already clear in April, after just one month working virtually, that "Zoom fatigue" was a very real phenomenon, now well-documented as the particularly exhausting nature of video calls [7,8]. Therefore, a full-day event would not be a preferable format. We touched base with our speakers to ask what alternative formats they would be open to. We considered postponing the event to the fall, spreading out the events over a few days or weeks, or cancelling it outright. After discussion with both the speakers and the officer team, we decided to convert the spring symposium into a summer speaker series. While we do not usually offer programming in the summer, we hypothesized that the increased attendance at our spring events would translate into continued interest over the summer, with students, staff, and faculty alike still craving opportunities to connect. We transitioned our planned symposium talks to the virtual summer series format, and replaced speakers facing schedule conflicts with other appropriate talks. Our efforts to transition the symposium were rewarded with high attendance and quality engagement in the summer series (Fig. 1).

Chapter 2: Reassessing chapter direction & goals (June 2020-July 2020)

2.1 Expert elicitation to evaluate chapter niche
We viewed the transition to a virtual environment, and subsequent increase in participation and engagement, as an important cue to reassess our niche as a student organization on campus. To gain outside perspectives, we interviewed faculty mentors and other school staff focused on STEM pedagogy (n=6). We requested feedback on (i) our existing programs, (ii) our role on campus compared to other available resources, and (iii) how to improve as a chapter moving forward.

We first interviewed our formal faculty advisor as well as two informal staff (lecturer) mentors and categorized their feedback. Three main categories emerged: (i) the role of the organization on campus, (ii) their impressions of our current programming, and (iii) the engagement between our chapter and the national society. Both of our informal mentors cited our chapter's unique role on campus in offering a meaningful community for student pedagogy development. The primary engagement many graduate students have with pedagogical training is through programming required for teaching assistants (TAs). This typically includes only one quarter of teaching for most engineering departments; few students undertake additional teaching roles. However, students may have time and interest in the aftermath of a busy quarter of TA responsibilities to reflect on the experience. Our advisors considered our events a perfect venue for these students to connect their experience to future teaching statements and personal pedagogy frameworks. In that regard, all three of our mentors considered our past programming strong and offered suggestions not to change our events, but rather to pursue a deeper connection to the national ASEE network. Our advisor noted that many of our chapter's previous officer teams had shown interest in submitting a paper to the national ASEE conference, although this goal remained unfulfilled. This was primarily due to unfamiliarity with the ASEE conference paper and IRB timelines, as well as the heavy time commitment associated with running our annual symposium.

We also interviewed three key staff members from teaching and learning centers across campus: one focusing on doctoral student pedagogy development, one focusing on postdoctoral pedagogy development, and one focused broadly on teaching and learning across campus. A major finding from these interviews was the need for a clearer definition of the teaching & learning ecosystem on campus. While other organizations on campus focus on formalized programs such as future faculty preparation programs, teaching certificates, and TA bootcamps, our ASEE chapter niche lies in offering less formalized and more interactive programs. Our chapter has the flexibility to host small discussion groups and cultivate pedagogical perspectives over multiple quarters, in contrast with independent workshops or courses meant to reach many campus members every year.

Across all interviews, we consistently heard that our email newsletters and event advertisements did not offer enough advanced notice about our programs. This hindered our campus mentors and partners in passing along announcements to potentially interested graduate students, postdocs, and staff/lecturers across campus. Three interviewees suggested advertising our complete set of events for an academic term by the start of that term. One interviewee suggested we create an easily-accessed shared calendar that people could subscribe to. Additionally, one

mentor suggested we attend engineering department TA trainings to advertise our programming as a way TAs can deepen their pedagogical perspective after their teaching experience.

2.2 Interpreting interviews & setting chapter goals

Our officer team prioritized a few quick and practical pivots after this need-finding exercise. We aimed to finish planning events by the end of the previous academic term so that we could advertise early in the next term through associated listservs and TA orientations. Further, we planned to hone our offerings and highlight formats and topics that are not covered by other campus resources (e.g., student-led discussions of anti-racist teaching practices, as discussed in Chapter 3).

In reviewing expert feedback, we realized that we lacked both a clear central mission statement and a statement of our unifying values. A mission statement defines how an organization is differentiated from other related organizations and would be critical as we sought to define our niche in the campus ecosystem. A values statement outlines common principles to uphold in programming and in the chapter community and would be critical as we sought to unify a vision for chapter programs and other goals. Our updated mission and values are as follows:

Mission Statement
Our mission is to advance effective, evidence-based, inclusive, and accessible pedagogy for engineering education across an engaged community. We aim to empower students, faculty, and future faculty in teaching and learning. We believe that diversity, equity, and inclusion are critical to our research and educational missions, and strive to uphold these ideals in our programs and in our community.

Values Statement
· Our strength is in our diversity: We aim to make engineering education research accessible and prioritize inclusion of diverse perspectives. We aim for educational equity in our ongoing and future pedagogical impact through diverse representation in our speakers and members and through events that promote diversity, equity, and inclusion in education. We make engineering education research more accessible by highlighting and discussing the most relevant, current pedagogic canon.
· We translate pedagogic research to practical applications: We strive to employ robust and effective educational practices by learning from evidence-based techniques and approaches within the field. We work to help our community stay current on well-founded best practices by critically engaging with recent literature and hearing from experts within the engineering education sphere.
· We grow through effort and persistence: We cultivate a growth mindset culture, seeking development and improvement in our understanding and practice of engineering pedagogy. The canon of engineering education research is always growing, so we continue to grow along with it and stay up to date via journal club and cutting-edge discussions.
· Our community makes us strong: We strive to build a supportive space for students and educators alike to learn from one another, encourage one another, and help one another.
· Students deserve great teaching: Learning environments shape futures. We serve our community to develop a teaching culture of excellence.

Finally, we concluded from our need-finding discussion that a virtual version of our annual symposium in the 2020-21 academic year would not effectively achieve our intended outcome of building community. We expected fewer networking opportunities and fewer attendees at a virtual symposium. After reflecting on alternative chapter achievements that were better-suited to the virtual academic year, we pivoted and focused our efforts on achieving a long-held goal of

our chapter by submitting a paper to the national ASEE conference. We chose to submit a qualitative paper outlining our student chapter experiences over the course of 2020's unprecedented events. We also documented our writing experience, including future paper ideas and their anticipated project timelines, so that future officers will have a streamlined pathway to pursue more involved ASEE conference papers.

Chapter 3: Executing an informed pivot in chapter roles & responsibilities (June-December 2020)

3.1 New strategies for increasing participation/engagement

Based on feedback from our expert elicitation, we aimed to improve advertising of our chapter's events. Before the start of the academic year, we updated our website with current information (including our mission and values statements) and integrated a calendar on our homepage that visitors could subscribe to. As the academic year began, we attended the TA orientation of each engineering department to introduce ASEE and share a flyer with our upcoming events. Additionally, we leveraged our existing connections with departmental contacts and campus teaching and learning services to advertise our events to their listservs.

Despite these efforts, we saw a significant drop in RSVPs and attendance near the end of the summer and into the fall (i.e., late August, September, October) (Fig. 1). Based on our own experiences and informal conversations with our peers, we hypothesized that the virtual environment was wearing down many community members. We decided to continue with our advertisement strategies for the remainder of the term (e.g., pushing to partner newsletters/listservs) and reassess participation afterwards.

3.2 New programming precipitating from a collective racial justice 'reckoning' (initiating June 2020)

The May 26, 2020 murder of George Floyd and the subsequent protests across the nation brought about a racial justice reckoning in academia. Our chapter hosted a virtual event on June 10, 2020 to discuss racism in engineering education as part of the national #ShutdownSTEM movement [9]. We read and discussed the resources presented in Table 1. We experienced high turnout (n=24), and found that participants were actively engaged and were motivated to respond to this challenge. The turnout, engagement, and enthusiasm of the participants led us to hypothesize that students were interested in an avenue to further discuss the intersections of racial justice and engineering education. Additionally, we recognized this moment as a unique opportunity to combine the renewed scrutiny of academic institutions' role in the racial justice landscape [10, 11] with student interest in discussing the relevance of these matters to their personal and professional lives. In the interest of promoting further dialogue between students and their academic institution on topics of racial justice, we decided to pivot our journal club from its previously broad focus on engineering pedagogy to an antiracism multimedia learning club. This refocusing also aligned with our revamped mission and values statement, described in Chapter 2.

The mission of our chapter's antiracism multimedia learning club is to discuss antiracism, culturally responsive teaching, and diversity, equity, and inclusion in engineering education. We encourage participation from all experience levels and foster a safe space to learn, digest, and discuss readings from books, essays, articles, podcasts, and videos. We opted for multiple forms of media to make the discussion more accessible, learn from a wide variety of voices, and

broaden our perspective. The media offerings from this learning club allowed us to differentiate ourselves from other pedagogy journal clubs. We hypothesized this would help increase participation compared to our original programming. Participants included students, postdocs and staff from various engineering departments (n=4), non-engineering STEM departments (n=3), and the Center for Teaching and Learning. The number of participants at monthly learning club meetings varied between 4 and 8.

We obtained the media selections for the learning club through widespread searches on the Stanford library server, general websites and blogs, and higher education podcasts. Search terms included antiracism, race, engineering education, diversity, equity, inclusion, and culturally responsive teaching. Media selections are presented in Table 1.

Table 1: Multimedia Selections for Anti-Racism Learning Club.

Multimedia Selection	Type of Media	Event	Ref.
Eaton et al. "How Gender and Race Stereotypes Impact the Advancement of Scholars in STEM"	Journal Article	Shutdown STEM, June 2020	[12]
#blackintheivory	Twitter	Shutdown STEM, June 2020	[13]
"THE TIME IS NOW: Systemic Changes to Increase African Americans with Bachelor's Degrees in Physics and Astronomy"	Report	Shutdown STEM, June 2020	[14]
"Fostering Inclusion in our Teaching" from the Inside Higher Ed Podcast	Podcast	Learning Club, August 2020	[15]
"Chapter 8: Visibly Invisible" by Deirdre M. Bowen from the book "Presumed Incompetent: The Intersections of Race and Class for Women in Academia,"	Book Chapter	Learning Club, September 2020	[10]
"Chapter 7: We're Mad As Hell, and We're Taking Over the Building" from "Blackballed: The Black and White Politics of Race on America's Campuses" by Lawrence Ross	Book Chapter	Learning Club, October 2020	[11]
"Culturally Responsive Teaching and the Brain" by Zaretta L. Hammond	Book	Learning Club, November 2020	[16]
"High Achieving Black Students, Biculturalism, and Out-of-School STEM Learning Experiences: Exploring Some Unintended Consequences" by Dr. Ebony O. McGee	Journal Article	Learning Club, February 2021	[17]

A designated ASEE officer acted as facilitator for each learning club meeting. The facilitator outlined 4-5 discussion questions and topics from the media selection on a shared document. Figure 2 shows our discussion question framework, which connected personal experiences with pedagogical theory to develop new frameworks with which to approach engineering education. Meetings began with each participant sharing broad thoughts on the media selection. The facilitator then posed discussion questions, and participants took turns speaking and sharing ideas [17]. With an aim to center the media selection specifically on the STEM educator's lens, our discussion questions encouraged reflection on individual identity and experience, observations of current classroom behavior, and suggestions for classroom interventions or novel pedagogies that could be implemented to create a more equitable classroom [19].
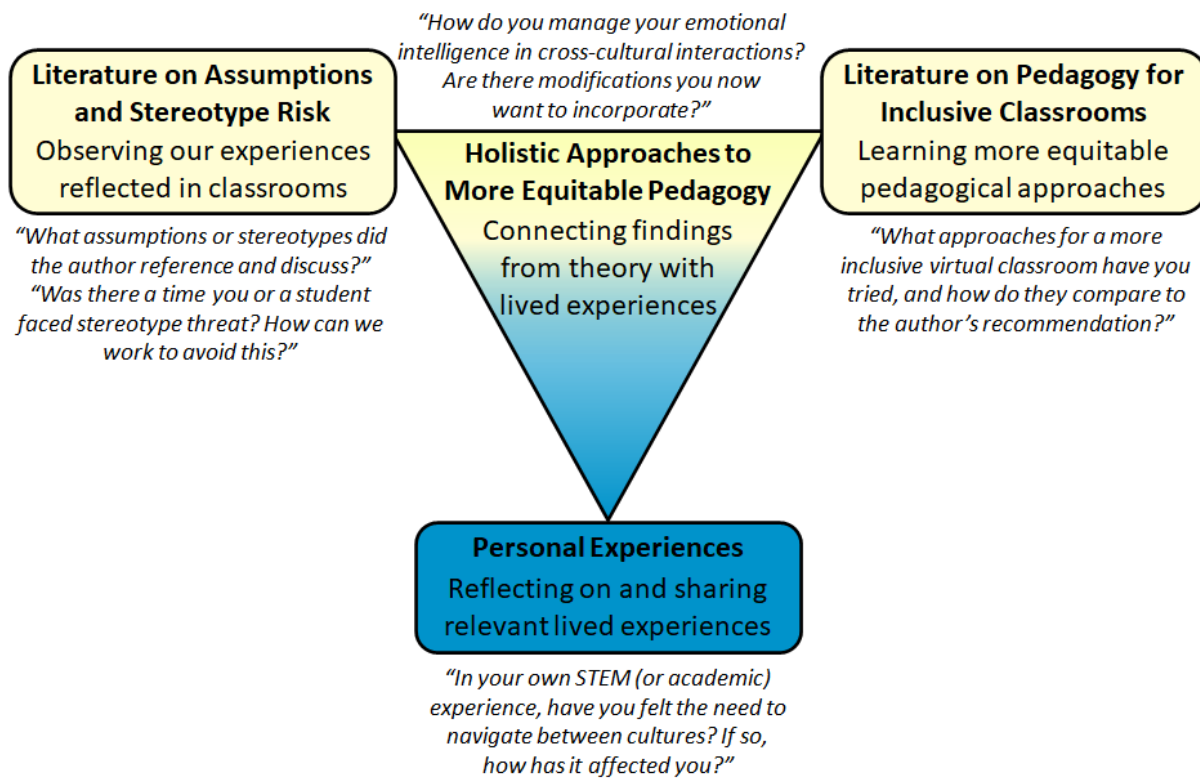

"How do you manage your emotional intelligence in cross-cultural interactions? Are there modifications you now want to incorporate?"

Literature on Assumptions and Stereotype Risk
Observing our experiences reflected in classrooms

"What assumptions or stereotypes did the author reference and discuss?"
"Was there a time you or a student faced stereotype threat? How can we work to avoid this?"

Holistic Approaches to More Equitable Pedagogy
Connecting findings from theory with lived experiences

Literature on Pedagogy for Inclusive Classrooms
Learning more equitable pedagogical approaches

"What approaches for a more inclusive virtual classroom have you tried, and how do they compare to the author's recommendation?"

Personal Experiences
Reflecting on and sharing relevant lived experiences

"In your own STEM (or academic) experience, have you felt the need to navigate between cultures? If so, how has it affected you?"

Figure 2: Discussion question framework for antiracism multimedia learning club. *This framework intends to connect personal experiences to literature on assumptions, stereotype risk, and pedagogy for inclusive classrooms in order to develop holistic approaches to equitable pedagogy.*

The cross-disciplinary backgrounds of participants in the learning club led to discussions of diverse perspectives on experiences of marginalization in academia and the learning environment, as well as modes to confront and mitigate stereotype risks to form a more inclusive classroom. Moving forward, we recognize the need to assess learning club outcomes such as quality of engagement, relevance of material, and incorporation of material into attendees' pedagogical frameworks. Future work should include regular assessments to gauge the attainment of learning club outcomes.

Chapter 4: Adjusting chapter goals and activities through iterative reflection (September 2020-present)

Despite continuously honing our event offerings and adjusting to a consistent virtual setting throughout the autumn and early winter, both event RSVPs and recorded participation continued to drop (Fig. 1). We engaged in several informal conversations with similar education-oriented organizations at our institution, including the Center for Teaching and Learning, and found that our experience was consistent with a broader decrease in attendance of extracurricular workshops, seminars, and discussions.

In reflecting on how to better tailor our programming to continue to support our community, we identified two main hypotheses that may explain this downward participation trend. One potential explanation for declining attendance is the practical difficulty of operating within an online learning environment. Such challenges are well-documented within our institution -- of 1,027 PhD students surveyed by the school's Institutional Research and Decision Support team (Spring 2020), 70% indicated that they experienced "difficulty focusing or paying attention to online instruction or activities," while 21% cited "negotiating time zone differences" as a challenge [20]. Since PhD students make up a majority of participants at our events, these logistical challenges may have contributed to our lag in attendance. The impacts of these challenges are also reflected by the experiences of faculty, another target demographic for our events: In a survey of 527 faculty members at our institution, 39% indicated that they were spending more time on teaching and 40% indicated that they were spending more time on advising/mentoring compared to pre-COVID [21]. These heightened time commitments are likely the combined effect of re-planning coursework to fit a virtual environment and accommodating the newfound challenges and needs of students during this difficult period.

Another potential explanation for our attendance drop involves the COVID-related mental health and wellbeing (MHWB) impacts. Multiple student surveys at our institution offered evidence of worsening MHWB. In a school newspaper survey (November 2020, N=612), 86% of students indicated that the pandemic had either a "slightly" or "very" negative impact on their mental health [22]. In a larger, administration-run survey (Spring 2020, N = 4,520), over 60% of students expressed "a lot" or "a great deal of" concern over maintaining friendships and social connections in an online learning environment [20]. Similarly, of 527 faculty members surveyed, 57% reported experiencing "a lot more stress" relative to their stress levels before the pandemic [21].

Our current understanding is that both hypotheses have merit. Neither practical challenges of transitioning to a virtual higher education environment nor negative shifts in MHWB are phenomena unique to our school: in an NSF survey of 3,335 graduate students across 12 public institutions in the U.S., 67% of respondents indicated a low wellbeing score, and individual responses cited isolation and anxiety [1]. This decrease in wellbeing has led to a negative impact in extracurricular engagements. Once an important source for students to establish friendships, explore their interests, and form social networks, extracurriculars have become a luxury of time and personal capacity. Not all activities can shift to online formats, and personal limitations such as poor internet connection and time differences hinder participation [23]. Further, these challenges are manifesting in reduced participation in non-essential online offerings to avoid

"Zoom fatigue" from an excess of video calls. Taken together, our hypotheses paint a picture of students that are facing novel challenges to their mental health, their ability to focus in an online environment, and their desired levels of engagement with their school network and peers. These findings helped us put our own experiences with our events in perspective.

Our reflections on these data, paired with our own experiences within our student chapter, left us at a fork in the road: moving forward, should we keep trying to meet our community growth goals despite palpable obstacles beyond our control, or should we form more realistic expectations and focus on nurturing our smaller community that has remained engaged? We decided that focusing on community engagement within our niche was both rewarding and time-efficient. Rather than spreading ourselves thin and holding every event that we would otherwise organize, we chose to streamline our energy into community-centered events. We discontinued our monthly Journal Club and directed that energy to our anti-racism learning club. We skipped organizing our annual symposium, and instead focused on submitting an ASEE conference paper. In a testament to the success of our community focus, two new officers have recently joined, both committed to our chapter values with respect to diversity, equity, and inclusion. Finally, we have begun recording our events and adding them to our website in order to make our content accessible to those unable to attend our events live due to previous engagements or time differences.

Conclusion

In 2020, our chapter community managed a major shift from in-person to virtual events due to COVID. Our efforts to increase participation in chapter events were not as fruitful as we hoped, but this is understandable due to the taxing nature of the environment on student wellness and engagement. Within the chapter officers community, we supported each others' wellbeing, learned a great deal about anti-racist STEM education strategies, and tackled a long-held chapter goal to engage with the ASEE national conference. These outcomes are testament to a positive and nurturing engineering education community that we are committed to continue developing in our post-COVID future.

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