The Prestige Game: Making Visible the Mental Health Effects of Institutional Prestige Seeking on Underrepresented STEM Students

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Introduction and Literature Review

This critical theory and arts-based research methods paper seeks to make visible the mechanisms and linkages between institutional prestige seeking, engineering education's disciplinary cultural notions of rigor, and the invisible and unexamined impacts on engineering students' mental health, particularly among underrepresented students. Our purpose is to increase awareness, generate new decolonizing discourses, and support action and activism in engineering education toward improving student mental health and the inclusion and support of underrepresented students. Through examining these linkages and mechanisms (Apple, 2019; Riley, 2017), engineering educators and researchers can further explore the unforeseen consequences of unquestioned–and sometimes invisible–institutional prestige seeking on student experiences. This study explores the lived narratives of underrepresented STEM student experiences and their perceptions from within a prestige-seeking STEM institution. To better understand undergraduate STEM students' perceptions of the role institutional prestige seeking could play in their mental health, we first need a broader context of how scholars in two key areas have conceptualized institutional prestige. First, we review the literature in higher education that accentuates the factors driving the emergence of the ranking of and competition between higher education institutions. Second, we show how the engineering education literature does not currently include explicit connections between institutional prestige and student mental health.

Higher education

University rankings are ubiquitous in U.S. higher education, having emerged into their present form over the 20th century as part of a system in which institutions compete for status and rank (Cohen & Kisker, 2010; Gonzales & Núñez, 2021; Wilbers & Brankovic, 2023). Although a comprehensive analysis of how competitive, ranked global higher education emerged in its current form is outside the scope of this literature review, it merits emphasizing that competition between institutions was by no means the norm in the first part of the 20th century. Wilbers and Brankovic (2023) explain that early modern assessment efforts evaluated institutions against emerging standards through individual expert authority figures visiting campuses and creating narratives based on conversations. By the mid-20th century, as business practices that focused on quality and efficiency gained social and economic dominance in the U.S. and statistical analysis became the preferred methods of evaluation, these new, competition- and ranking-oriented approaches fit with the increased enrollment in U.S. colleges and universities (Wilbers & Brankovic, 2023). Additionally, particularly in STEM education and research, a realization that advances in technology, science, and engineering were crucial to national Cold War efforts required schools to constantly be evaluated to receive federal funding for more sophisticated and expensive laboratories (Apple, 2019; Seeley, 1999; Wilbers & Brankovic, 2023). By the 1970s, a culture of continuous improvement emerged in higher education that pressured individuals, but also departments and institutions, to constantly strive towards excellence in performance (Wilbers & Brankovic, 2023). During this period, the concept of a meritocracy in education was clarified in which success in competition and entrepreneurial vision was elevated as a contrast to traditional societies that value the status quo; that is, *modern* individuals and institutions must continually rise, climb, and get ahead of their competitors. What has emerged today is a normalized discourse that accepts a zero-sum serialized global ranking system, which caters to a

student market in which all institutions must regularly evaluate themselves and be evaluated by outside agencies and influencers to compete. Such ranking systems are so ubiquitous that faculty and administrators today rarely challenge them, let alone connect those systems to their effects on students (Apple, 2019). Gonzales and Núñez (2021) additionally note the influence of scientific positivist epistemology and neoliberalism in which quantitative rank and prestige seeking are unquestioned because economic markets and science are linked tightly. It is this invisibility of striving and competition for prestige that our paper seeks to explore in relation to underrepresented STEM student experiences, quality of learning, and student mental health.

Engineering education

When issues of institutional prestige are discussed in the engineering education literature, they do not focus on the effects of prestige on student wellbeing and mental health. For example, one study accentuates accreditation rigor (Patil & Codner, 2007). Since that publication, the Accreditation Board for Engineering and Technology (ABET) has become the de facto global accreditation standard by signing mutual recognition agreements and memoranda of understanding with other accreditation bodies that use ABET or ABET-like accreditation standards (ABET, 2023). Although not explicitly discussed in engineering education literature, such homogenization means that many global engineering programs are competing to meet or exceed ABET accreditation standards or risk losing prestige. Using the intentionally broad search terms "institutional prestige and mental health" in ASEE's PEER database (https://peer.asee.org/), 41 results were found, with only four mentioning prestige, and only one in the context of engineering students' mental health (Sanchez-Pena & Otis, 2021). In that case, the instance of *prestige* did not refer to *institutional* prestige, but more generally to the prestige related to being an engineering student.

As engineering education studies of institutional prestige do not directly explore issues of student mental health and well-being, we also asked the inverse of this question - do studies that tackle issues of student mental health and well-being mention prestige? Jensen (2021) calls for shifting the culture of stress to a culture of wellness, but institutional prestige is not the focus of that shift. While some mental health in engineering studies draw connections between engineering stress culture and a culture of rigor and struggle (Jensen & Cross, 2020; Jensen et al., 2023) and a connection between that stress culture and a decreased likelihood to seek help (Wright et al., 2023), they do not explicitly connect that culture of rigor and struggle to institutional prestige. Moreover, while recent research is making visible the connection between high workloads, high stress, and students' mental health (Jensen & Cross, 2020; Jensen 2021), current engineering education research has not yet made visible the connection between high workloads, high stress, and prestige. Figure 1 shows these existing connections (solid lines) and invisible connections (dotted lines). Generally, in engineering education literature, the issue of institutional prestige has been rendered invisible despite literature questioning the cultural impact of the engineering meritocracy on engineering education (Cech, 2013). Whether institutional prestige-seeking is playing a more salient role in STEM student mental health remains a largely unexamined question, especially from the perspective of STEM students.

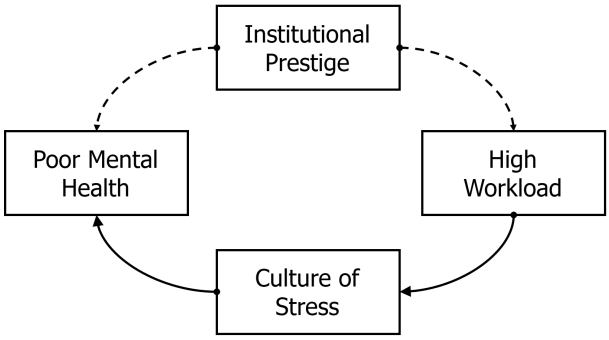

Figure 1: Visible and Invisible Connections between Institutional Prestige and Students

Theory and Methods

The original study from which this paper emerges occurred at a western U.S. engineering-focused public university, the Colorado School of Mines (Mines), from 2022-2023 (Robert, 2023). Our inquiry into prestige represents a secondary data analysis (SDA; see Case, Paretti, & Matusovic, 2021), using data and content that were originally collected to explore undergraduate students' personal experiences as underrepresented students in the culture of engineering. The researcher who originally collected the data (Robert) is joined by Authors 2 and 3 in this SDA inquiry and analysis. A novel *creative materialism* conceptual framework (Robert, 2023) was theorized for this interdisciplinary and participatory qualitative and arts-based research methods dissertation research project with three underrepresented STEM students. Creative materialism has three components that function together. One is the decolonizing framework of culturally responsive methodologies (CRM), which emerged from the Indigenous Māori of New Zealand and *Kaupapa Māori* (Berryman et al., 2013a), which rejected the hegemony of Western education standards, beliefs, and practices over the local Indigenous practices, wisdom and culture. This particular methodology was chosen as an inclusive power-sharing participatory framework in which respectful community building is paramount. The second component is Nail's kinetic new materialist *contemporary loop object theory* (2021), which utilizes quantum field theory, chaos theory, and mathematical category theory to update and show how the generation of new scientific knowledge is material, relational, and iterative, not objective. The final component is arts-based research methods to create creative content for analysis both by the researcher but also the participants (Leavy, 2015). Arts-based research methods are a culturally responsive methodology (Berryman et al., 2013a, 2013b; Nodelman, 2013) that fits with Nail's contemporary loop object theory's focus on material intra-actions and emergent subjective knowledge production (2021). Creative materialism is an inclusive, respectful, flexible, and transformative framework for collaborative self-exploration and the examination of institutional and cultural mechanisms of power (Robert, 2023).

Participants and Recruitment

After receiving IRB approval, three undergraduate participants with multiple underrepresented identities were recruited through email in December 2021 (Robert, 2023). Participation was limited to three undergraduate students *because* the research methods required a type of emotional rigor and CRM requires researchers to be responsive and build relationships of trust and reciprocity with the participants (Berryman et al., 2013a; Berryman et al., 2015). However, a small number of participants is not seen as a limitation in arts-based research methods, which

have different goals than quantitative methods (Barone & Eisner, 2012), namely richness and personal depth rather than broad generalizations. Data collection methods included four individual semi-structured conversational interviews (Zhang & Wildemuth, 2009), weekly journal entries (Sheble, Thomson, & Wildemuth, 2009), and creative content generated by the participants in the form of poetry, photography, drawing, and painting. A focus group was held with all three participants in March 2023 to discuss the findings (Chauhan & Sehgal, 2022). Power was shared with the participants by sending interview prompts prior to meeting, letting them lead conversational interviews, and reviewing their interview transcripts and the final written documents for accuracy. Participants also chose which of their journal entries and creative content to share. Each chose their own pseudonym for the study to protect their privacy. A major finding of the study was newly discovered neurodivergent identities including autism for all three participants and the primary investigator, which emerged from the trust and rapport created during the data collection process itself (Robert, 2023).

Participant Profiles

Esperanza was a sophomore during data collection in spring 2022 and identifies as mixed-race and Hispanic, heterosexual, Christian, cis-gendered female, a first-generation engineering student, low-income, and physically disabled with a chronic pain disorder, asthma, and autism.

Eilidh was a junior during data collection and identifies as a white, queer/bisexual, first-generation student and low-income, cis-gendered female, and physically disabled with a chronic tissue, joint, and pain disorder, ADHD, dyscalculia, aphantasia, and autism.

Creek was a senior during data collection and identifies mixed-race and Asian-American, queer/bisexual, first-generation American student of immigrant parents, and cis-gendered female with a chronic anxiety disorder. Creek was the only participant whose parents were STEM professionals. She self-diagnosed as autistic at the end of the study.

Data Analysis

Analysis in both the original study and in this paper was iterative, emergent, and relational in keeping with the creative materialist framework (Robert, 2023). In the original study, each individual participant's interview transcripts, diary entries, and creative content were printed on paper and examined together with key words and phrases that were color-coded to make salient insights visible and triangulate across methods, data, and content. From this process, the next round of interview prompts was generated and shared with each individual participant prior to the next interview to customize their data collection methods in culturally responsive ways (Berryman et al., 2013a; Berryman et al., 2013b). For this paper, the participants' content and data were looped through once again, however with a focus on how the participants perceived the relationships between the striving for prestige among students, faculty, professional engineers, and the school itself and the impact this striving has on students. In the next section, study data and content are used to show how the participants linked prestige with extreme rigor and students suffering with poor student health, particularly among underrepresented students. We also show how the participants perceived the paradoxical relationship between diversity, inclusion and access (DI&A) efforts related to institutional reputation and prestige, yet also how these efforts and disability accommodations are seen as a threat to prestige by some due to fears of reducing student quality. Due to space limitations, the participants' creative arts-based research methods content will be shared at the conference presentation.

Findings

Three main themes emerged from the study findings related to institutional prestige seeking at this engineering focused state university: (1) Rigor and institutional prestige are both hyper-visibly and invisibly linked; (2) Diversity, Inclusion, and Access (DI&A) is paradoxically both required for institutional reputation but simultaneously seen as weakening quality and therefore institutional prestige, causing mental health stress to underrepresented students; and (3) Students both appreciate institutional status and its benefits while feeling like pawns on a chessboard in prestige seeking efforts. Together, these findings make visible the connections between institutional prestige seeking and its impact on students (Figure 2).

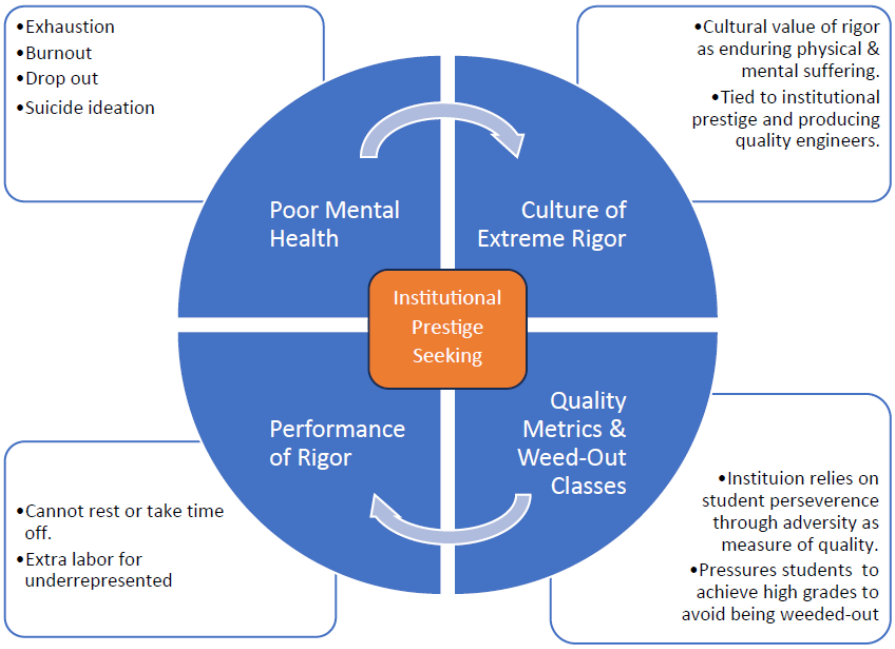

Figure 2: The Cyclical Mechanisms of Prestige Seeking and Poor Student Mental Health

Hypervisible and Invisible Rigor Linkages to Poor Mental Health and Prestige

The participants shared that in engineering culture, to be deemed "good" students, engineering students must **perform** extreme rigor and demonstrate their merit and dedication by communicating their degree of suffering (lack of sleep, not eating, etc.) to their peers and faculty (Robert & Leydens, 2023). They shared how the school justifies the benefits of this suffering with narratives that previous students and graduates did it, so they must too. As Esperanza said:

> *I wonder, could I get the same education with less taxing academics? Like, I don't know if I could or not. Like, I feel like that's something that Mines students just talk about a lot is like, do we really need to be doing all of this? But I guess it's part of the prestige and all that stuff. Like, you know, oh, you go to Mines, so you've got to work hard, and you have got to be an Oredigger… we're all going through it. So, you've got to go through it as much as the rest of the people who graduated before you kind of deal, because that's what makes you a graduate from Mines* (Robert, 2023).

Participants reported that students are told that they will appreciate the suffering later when they get a job based on Mines reputation. As Creek shared, "*Everyone's like, everyone wants to hire Mines students. They hear you're a Mines student and you'll get an offer, which is an unnecessary lie. This then stresses people out because it might be true for some people--some people get job offers immediately. But some people are like, well, I did all this work, and I did all this suffering and I'm not getting immediate job offers. What am I doing wrong*?" (Robert, 2023). However, later at a focus group with all three participants in Spring 2023, they discussed how rigor and prestige emerged as a finding and the narrative that "everyone wants to hire a Mines graduate" (Robert, 2023). At this meeting, the participants agreed that only some majors at Mines, like petroleum engineering and mining engineering, are highly prestigious among employers, but not all.

As all three participants were from Colorado, their parents were aware of Mines' reputation and had concern for their daughters' mental health at the school. As Eilidh shared, "*I went on a first-gen tour group day with my mom. I remember her kind of looking at the school kind of like whoa, this looks intense. Because everyone has heard the reputation that students at Mines are going to kill themselves. Everyone knows the reputation–'Damn, that's Mines. Its students are depressed, and the students die*'" (Robert, 2023). However, Mines reputation as a difficult and elite school in Colorado also created pride among family, parents, friends, and community, which in turn created pride in the participants. Indeed, within engineering education culture, suicide and suffering have historically been seen as indicators of a high-quality, rigorous quality school (Cross & Jensen, 2018; Riley, 2008, 2017). Creek is a legacy STEM student whose immigrant dad is a college professor in engineering and physics and she shared how he socialized his daughter from age 11 to endure the required suffering of engineering education (Robert, 2023). In her interviews and diary entries, Creek recounted how, to her dad, suicide was the sign of a good school that produced quality engineers. Creek described how she never visited the campus as, according to her dad, it was "not important." She was attending due to the prestige and quality of the school, and the poor mental health of its students was evidence of its quality.

Relatedly, in a previous paper (Robert & Leydens, 2023), the study's data and content were critically examined to show the *invisible* linkages the participants reported between extreme rigor and student mental health to informal policies (invisible to students and parents) of "weed out" classes. All three participants reported their confusion and uncertainty about these informal policies but indicated that weed out classes are perceived in engineering culture as crucial to the sorting of "quality" students from "weak" students and are linked to institutional prestige: Weak students are believed to damage Mines' reputation of producing quality engineers. All the participants explained how this belief creates a fear of asking questions in class and that students performed their extreme suffering/rigor with each other while hiding their fears of being weeded out. The participants noted that this policy contradicts Mines' narrative that Mines students do not compete with each other, but instead develop teamwork skills that bring value to their careers in industry. However, these invisible school policies reinforce the practice of students comparing themselves to their peers who seem to struggle less and get better grades. Additionally, the performance of rigor means that students feel that they cannot take time off, which affects their mental and physical health. During data collection, Esperanza repeatedly voiced concern in her interviews, journal entries, and poetry that any time she took to recover from the trauma from a peer's suicide attempt meant she would fall behind and/or not be taken seriously by her peers or professors (Robert & Leydens, 2023). As all three participants discovered that they were

neurodivergent through the study, it became clearer that other issues, like physical disabilities and mental health impacts, were exacerbated by the lack of rest and worsened overtime. The study (Robert, 2023) showed that students internalized comparisons with their peers' successes, leading to beliefs about themselves like, "I am failing; I do not belong here; I cannot be an engineer" rather than gaining ease with the uncertainty and discomfort of learning, which requires effort and struggle. The participants also communicated that students feel that faculty cannot always be trusted to help, so students do not show weakness or their struggles. As Creek stated about the meritocracy in engineering, "*Everyone wants to be the smartest person in the room*," (Robert, 2023) and that she thought prestige shows in one's status in industry by rank, like senior engineer, and through ones' salary, especially when compared with other disciplines: higher pay means engineering is more important. Participants agreed that invisible rigor, like weed-out classes, makes the school the enemy of the students (Robert & Leydens, 2023). As Creek shared in her journal, "*The purpose of weed-out classes is to beat you into the dirt; they are doing this to us*" (Robert, 2023) While she acknowledged that this suffering creates a sense of camaraderie and a survivor community through shared trauma, it was not seen as healthy by any of the participants. However, all three participants agreed that the culture perpetuates a belief that Mines alumni survived and are therefore special.

Diversity, Inclusion & Access, Mental Health, and Prestige

The participants' own underrepresented identities served as vehicles for exploring their experiences of the culture of engineering (Robert, 2023). Each shared that they felt that diversity, inclusion, and access (DI&A) programs were paradoxically required for Mines to maintain its reputation as an inclusive school, while explaining their perception that in engineering culture, DI&A is believed to also undermine the school's prestige potentially as an elite engineering institution. This ideological belief rests on the perception that affirmative action and accommodations for disabilities would reduce the quality of graduates, and thereby the institution. Participants reported that affirmative action is not seen as balancing and correcting the historically skewed pools of potential students, but as giving spots to un- or underqualified women, disabled people, or people of color, effectively displacing qualified male and/or white students (Robert, 2023). Instead, there is an embedded cultural sense that DI&A recruiting is manipulation and special treatment in what is believed to be a meritocracy that exists without bias in which it is believed that the best engineers emerge through "rigorous" competition among students who can endure the physical and mental suffering unrelated to learning. The participants reported that female and students who are Black, Indigenous, or People of Color (BIPOC) were notoriously questioned or challenged (directly and passively with comments and "jokes") that they are affirmative-action students who needed help getting into Mines and that they could not do it on based on their own skills, knowledge, and grades (Robert, 2023). However, both Creek and Esperanza voiced that students who lack pre-college preparation, like first-generation and low-income students, may not be prepared for Mines' rigor as compared to legacy students like Creek, and therefore may be weeded out early in classes. Esperanza was particularly concerned that low-income students cannot afford to retake classes they fail. They also noted that multiple failed classes hurt their own reputation and future job prospects as low GPAs will be caught in online job application filters. Eilidh was particularly concerned with this mechanism because of her neurodivergence and physical disabilities, which affected her performance and grades despite her comprehension of materials. When combined with a fear of showing weakness and not receiving necessary accommodations that merely place disabled students on the same level as

abled-bodied students, the participants shared that underrepresented students can burn out and sometimes drop out. Importantly, they felt that little thought is given by the institution to the long-term consequences for these students mentally and emotionally (Robert, 2023).

Interestingly, all the participants voiced that in their experiences, Mines hides these less prestigious statistics, like underrepresented dropouts and mental health impacts like suicide attempts, while advertising higher enrollments from underrepresented communities (Robert, 2023). All three participants stated repeatedly that Mines statistics are important to institutional prestige and used by administrators in marketing and recruitment. The most poignant of these examples was from Esperanza, who identifies as mixed-race and Hispanic. She explained that she allowed her picture to be used by the school for marketing but was upset at how much it was used. She reported that she felt manipulated, exposed, and exploited and that not only does Mines use of minority images not accurately represent the demographics of the campus, but instead advertises that Mines has a particular *quantity* of BIPOC students rather than inspiring inclusion on campus (Robert, 2023). Relatedly, Eilidh shared that she thought that DI&A statistics are used to compete with other peer institutions but also more established prestigious schools like Harvard and MIT. She noted that schools must have DI&A programs now is a reputation criterion: Mines is doing it because other schools are, and schools must "look" inclusive to compete. As a disabled student Eilidh resented what she felt was the contradiction between a self-congratulatory narrative of pride in the institution's DI&A reputation while she was often asked if she "needed" her accommodations by faculty based on suspicions that accommodations may harm Mines' reputation. She stated that this questioning implied cheating, which dehumanized and diminished her as a person. Eilidh felt that the lack of understanding about disabilities and the needs and differences of these students by faculty disadvantages disabled students. Additionally, a clear finding of the study (Robert & Leydens, 2023) was the required invisible extra labor underrepresented students exert by continuously advocating and communicating for their needs to educate faculty, staff, and peers about how their experiences as underrepresented students are different, which was usually received with skepticism and indifference. The participants reported that they were suspicious of the school's goals and intentions with their DI&A efforts.

Institutional Striving for Prestige and Student Perceptions

All three participants acknowledged that attending Mines gave them access to expert faculty and state-of-the-art laboratories, which they appreciated: they understood they were benefiting from attending this elite institution. During the study, Mines gained Carnegie R1 status as a research institution (Rankings, 2024), a well-established criterion in higher education prestige and rank. Eilidh stated that this news was celebrated by faculty and repeatedly shared with students in relation to the school's reputation and future research money and grant opportunities for these faculty. Importantly, in the original study (Robert, 2023), participants did not explicitly connect faculty research with their own negative classroom experiences. Instead, the participants reported that they often experienced a lack of preparation, organization, and time to help students by faculty, which they interpreted as faculty "not caring" about students and teaching. Relatedly, Eilidh shared how she perceives that Mines has an inferiority complex and is constantly comparing itself to other institutions that rank higher and have more prestige, which in turn hurts students:

> *It's unhealthy. Because if the school has an inferiority complex, it's not going to be healthy for the students… If the school feels like it has to constantly compete with the bigger tech institutions -- like if you think about engineering schools, you think MIT and Caltech? So, which means they're competing using us. It's like a very big chessboard, and we're the pawns. And the biggest common chess strategy is you can lose your pawns. So, they want us to have good numbers. They want us to look pretty in a statistics book so that they can compete with the big schools.* (Robert, 2023)

Eilidh described an article that was shared across campus repeatedly in which Mines students were reported to outperform Harvard students on online brain tests (Hernandez, 2019). She indicated that faculty and staff could not stop talking about it and it was a self-congratulatory "pat on the back." She felt the comparison was ridiculous given the differences between the schools in terms of size, history, endowments, disciplinary scope on campus, etc. She also felt that Mines invests its money in prestige items over student wellbeing and especially mental health resources such as staffing the counseling center (Robert, 2023).

Limitations

Because of the unique interdisciplinary, subjective, and participatory framework in the original study (Robert, 2023) there are several limitations to our conference paper. First, the participants' data and content are the perspectives of three underrepresented students at one engineering institution during a specific time period and must not be generalized to all students in STEM. Secondly, other researchers, with their own unique positionalities, skills, and relationships to specific institutions in terms of striving for prestige as well as different participants would change the inquiry. Students and participants who share underrepresented identities, like gender or disabilities, must not be essentialized as all the same and the findings should not be extrapolated to those with similar identities elsewhere. Lastly, this paper is a secondary data analysis of the original data, meaning that participants may have more to add if they were probed further about the linkages we lay out here.

Discussion

Our paper seeks to make visible how institutional striving and competition for prestige are linked to underrepresented STEM student classroom experiences, quality of learning, and student mental health. The participants' data and content show that they perceive Mines to be an institution striving for prestige (Gonzales and Núñez, 2021. The participants' identification of striving discourses, like faculty comparisons of Mines students to Harvard students, and the excitement and prestige of achieving R1 Carnegie status, after 148 years as a small regional state STEM school, are two examples of how these discursive mechanisms are linked to prestige seeking. Creek's familial socialization into engineering rigor by her STEM professional parents clearly illustrates a striving student, but one who questions the implications of this culture of extreme rigor and its impact on student mental health, particularly among underrepresented students. Eilidh's comparison of the students as expendable pawns in a chess match are salient as well given the school's continued reputation for poor mental health among students, demonstrated by the participants' families' perceptions about Mines' rigorous reputation and their daughters' well-being, but also the repeated discourse that their suffering will pay off when they graduate into a prestigious job based on their Mines diploma. In relation to the current

research both in higher education and engineering education, our findings also expose substantial gaps in our understanding of how rankings and institutional competition affect student experiences.

However, we also showed how these gaps are particularly salient for underrepresented students in STEM disciplines that epistemologically rest comfortably in quantitative measurements and explanations (Bucciarelli, 2009; Godfrey & Parker, 2010; Riley, 2017) and a hierarchical meritocracy that is culturally regarded as both normal and necessary for producing quality engineers (Cech, 2013, 2014; Riley, 2017; Seron et al., 2018). All three participants sensed a tension in the linkages between institutional prestige seeking and paradoxical campus DI&A discourses and fears of diluted rigor through accommodation of disabilities and intentional recruitment of underrepresented students. The type of striving behavior shown in Esperanza's stories about the overuse of her image in marketing must be made visible so that educators can increase their awareness of how they may very well negatively impact the very students they are trying to recruit and retain. Another example is Eilidh's perception that DI&A improved the school's reputation and prestige, while faculty simultaneously questioned if her accommodations were necessary. Additionally, Eilidh voiced concerns about her own ability to get into a graduate program with her low GPA, which accommodations and the *development of her strengths by faculty* would improve (Chrysochoou et al., 2022; Stenning & Rosqvist, 2021). Clearly, a more complete picture of barriers to a culture of wellness must involve not only more such student perspectives, but also perspectives from faculty, administrators, and other stakeholders in and outside of STEM education.

Future research opportunities

Jensen's (2021) call for shifting the culture of stress in engineering education to a culture of wellness raises important questions for future research related to institutional prestige seeking. If there truly is a link between poor student wellness and high institutional prestige, then what are the implications of shifting to a culture of wellness while ignoring prestige issues? Can engineering maintain its "prestige" without its reputation of student suffering? Does the reputation of suffering and hardness on which engineering prestige rests emerge from its underlying meritocratic assumptions–that is, are those who work the hardest and suffer the most the most deserving of respect, money, and prestige? Other questions remain. How does a culture of extreme rigor tied to prestige seeking at a STEM institution that prizes brilliant mathematicians, scientists, engineers, and researchers impact their perhaps substantial yet often invisible autistic student body? Meaning, could a culture of extreme suffering be harming the very gifted and exceptionally skilled neurodivergent students the school seeks by not accommodating differences (Chrysochoou et al., 2022; Stenning & Rosqvist, 2021)? Also, if a similar study to this one were conducted on students with social identities that are considered the norm in engineering–such as white, able-bodied, heterosexual males (Cech, 2022)–how might the findings overlap and differ? We feel that while focused research and intervention efforts on student enrichment experiences and extracurricular efforts to increase belonging remain worthwhile areas of inquiry, we argue that clearly more research is needed on the linkages we show here. For example, how are faculty pressures to produce research for their own prestige in a striving institution unintentionally transferred to students and further add to student stress and exhaustion? Does this data suggest faculty in STEM institutions are unwitting participants in a game of prestige? If so, do we not also bear some responsibility for declines in mental health among students and perhaps ourselves? These and other questions merit further research.

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