

Community Culture Wealth as a Strength or Strain: Analyzing its Role in Mental Health in Engineering (Work in Progress)

Vanessa Barham, University of Texas at El Paso

Rose Cecilia Meza, University of Texas at El Paso

Dr. Nichole Ramirez, University of Texas at El Paso

Dr. Nichole Ramirez is an Assistant Professor in the Department of Engineering Education and Leadership at the University of Texas at El Paso. Previously, she served as the assistant director of Vertically Integrated Projects at Purdue University. Her research focuses on engineering education and the stigma surrounding mental illness. Dr. Ramirez also worked as a research data analyst in Purdue's Department of Institutional Data Analytics & Assessment. She earned her doctoral degree in engineering education and a master's degree in aviation and aerospace management from Purdue University, along with a bachelor's degree in aerospace engineering from the University of Alabama.

Work-in-Progress Paper: Community Culture Wealth as a Strength or Strain: Analyzing its Role in Mental Health in Engineering

Abstract

This work-in-progress research addresses that while mental health is a growing concern in engineering education, existing support services often fail to account for the diverse cultural backgrounds of students. This study addresses this gap by leveraging the Community Cultural Wealth (CCW) framework to reframe cultural differences as assets. The project explores how six forms of cultural capital (aspirational, familial, social, navigational, resistant, and linguistic) influence engineering students' mental health experiences across their undergraduate studies and into post-graduation transitions to graduate school and the workforce. By examining how CCW shapes coping mechanisms and help-seeking behaviors over time, this work aims to inform the design of more culture-positive support services. This study is guided by three primary research questions: (1) How does resistant capital influence engineering identity to shape students' attitudes toward seeking mental health support? (2) How do cultural values rooted in familial and social capital influence students' willingness to engage with professional mental health services? (3) In what ways do institutional structures currently support or undermine students' CCW in the context of mental health?

Our methodology consists of a secondary thematic analysis of longitudinal interviews previously conducted with engineering students at two institutions with large engineering programs. These interviews explored the connection between engineering identity and mental health seeking attitudes. A novel codebook aligned with the CCW framework was created to identify how students utilize their cultural assets when navigating their degree and mental health challenges, with a focus on how these strategies shift over time.

This submission will detail our theoretical framework, analytical approach, and the development of our CCW-based codebook. The anticipated outcomes will provide actionable insights into engineering students' holistic well-being for educators, administrators, and student support staff, establishing a foundation for developing more culturally responsive and effective mental health support practices in higher education.

Introduction

The purpose of this WIP research paper is to examine the use of CCW as a factor in engineering students' mental health within the context of engineering culture. The mental health of undergraduate engineering students has been a growing area of research. While current research shows that engineering students do not have an increased *reporting* of mental health conditions (MHC) compared to their peers, there is evidence that those engineering students who do experience MHC are less likely to seek professional help.[1] This gap in help-seeking particularly impacts marginalized students, who, in contrast to more representative demographics in engineering, *do* report higher rates of MHC due to the high impact of degree-specific stressors [2], [3]. Existing literature identifies a "culture of stress" [4] and a "meritocracy of difficulty" [5] that normalize burnout and overwork. With its predominantly masculine and competitive nature, this culture can create a barrier to discussing MHC and helps explain the disproportionate effect on students from diverse backgrounds [6].

Author's previous thematic analysis of 60 longitudinal interviews from two universities with large engineering programs confirmed that engineering culture has a substantial impact on MHC and help-seeking attitudes [7]. However, this analysis was deficit based showing how engineers framed MH as a technical problem to "be solved alone" and encouraged a "grind culture" where students felt that if they were not more stressed than their peers, they were not working hard enough. While identifying the connection between engineering culture and decreased help-seeking is critical, our previous analysis focused primarily on the negative aspects of engineering culture. Shifting away from such a deficit-based approach, this work-in-progress now looks through an asset-based lens at how students from underrepresented backgrounds react to and navigate MHC using inherent strengths from their inherited personal culture. The workload of engineering itself left little room for mental health resources, such as therapy appointments or self-care, and the dominant culture of masculinity and whiteness was found to place additional distress on women and students of color. These aspects of engineering culture increased their mental health burdens while decreasing their likelihood of showing the vulnerability required to seek help.

This work-in-progress now shifts to an asset-based point of view exploring how underrepresented students exhibit the use of their inherited personal culture to counteract the deficit in MH seeking the engineering culture induces. We used Yosso's Community Cultural Wealth (CCW) framework [8], which posits that marginalized communities possess unique strengths, or capitals. These include Aspirational Capital (hopes for the future, often maintained against barriers); Linguistic Capital (intellectual and social skills learned through multilingual or multidialectal experiences); Familial Capital (cultural knowledge, history, and values passed down through generations); Social Capital (networks of people and community resources); Navigational Capital (skills and abilities to navigate social institutions); and Resistant Capital (knowledge and skills developed through opposition to oppression). In addition to this, we will also incorporate a newly proposed "psychological capital" (Internal strengths and positive self-perceptions that enable students to navigate their educational environments effectively) [9]. Using these capitals, we are conducting a secondary thematic analysis [10] of the original longitudinal interviews to analyze how students use these forms of wealth as assets to navigate their mental health, inform their help-seeking attitudes and utilize other non-formal support approaches.

While we are analyzing CCW impacts on mental health overall, this study is guided by three primary research questions: (1) How does resistant capital influence engineering identity to shape students' attitudes toward seeking mental health support? (2) How do cultural values rooted in familial and social capital influence students' willingness to engage with professional mental health services? (3) In what ways do institutional structures currently support or undermine students' CCW in the context of mental health?

Methods

This study utilizes secondary analysis of a longitudinal study dataset that investigated the engineering culture and effects on MH help-seeking attitudes. This original study was framed around structured longitudinal interviews with undergraduate engineering students from two large public institutions [7]. The demographics of the original study included a total of 211 participants where men made up much of the sample with 59.7% and women with 35.5% which is higher than the national average (22-24%). The majority were white with 59.2% followed by

“Other” with 20.9% and “Two or more races” with 13.7%. International students made up 21.3%, which is slightly higher than the national average for international students in engineering. While the national average for minorities is slightly higher than the demographics in the study set (made from “other” and “two or more races”), the minorities that were present in the study set reported *double* the rate of MHC experiences making their cases significant to analyze. Thus, selecting randomized cases from this study set would give us overall representative demographics of the engineering field with important implications for how culture impacted their navigation of their increased reporting of MHC. For our secondary study, a subset of 10 cases was selected via simple random sampling to ensure any demographic could have been picked. Each case consists of interviews over a three-year period which allowed us to focus on how the cultural capitals relate to MH help-seeking attitudes changed over time.

Our data analysis was conducted by writing a preliminary codebook developed from codes relating to the MH conditions and help seeking attitudes in the original study as well as Yosso’s CCW framework [8] and psychological capital [9]. Using Dedoose, open coding was applied to identify child codes needed under each capital parent code, as well as any other additional codes they felt were missing to properly interpret the data. To ensure the process for coding in all cases was consistent with the addition of a new code, including a child code, the previously coded interview transcripts were reviewed and recoded as needed. Scores of .60 and .55 were recorded for interrater reliability. This interrater reliability is preliminary with mixed personal interpretations of the separate community capitals being the root of the low value. CCW can have many interpretations as to what each capital includes and how it is expressed verbally in interviews. To address this issue in the future, clear interpretations of each capital would be agreed upon *before* the coding process was started, and any discrepancy during the coding process would be discussed between all coders.

Throughout the coding process, the researchers used text memos to capture reasoning and insight. Following coding, the researchers began the process of thematic analysis [10] where the memos and code application count of CCW codes relating to MHC and MH help-seeking attitudes were reviewed to identify recurring themes.

Results

Preliminary analysis revealed three main themes seen below which reflected how students draw on interpersonal relationships, cultural norms, and personal coping strategies to manage their MH throughout their engineering education.

Increased social capital within engineering context

Social capital was the most prominent form of CCW observed appearing in all 10 cases. Students consistently described peer relationships as the primary means of coping with academic stress and maintaining emotional well-being. Over the three-year period, many reported an increased sense of belonging that developed through shared coursework, team-based projects, and structured collaboration, which created regular opportunities for interactions. One participant emphasized in their first year that a “really good social web is important for overcoming” anxiety and depression, while noting that not all students have access to such support (Sara, Year 1). Later, the same participant described how becoming more socially integrated within her major made it “easier to like work and study together,” helping take “some of the stress away from schoolwork despite increasing workloads” (Sara, Year 3). Social capital often extended to family

and partners who provided emotional support grounded in social or cultural understanding (Molly, Year 1).

Familial capital influence on MH seeking attitudes

Familial capital was seen in seven cases revealing mixed impacts on students' MH views based on passed down cultural stigmas. Chris noted, "I'm South Asian, so seeing that it is very much overlooked in our community. If you are feeling something, it's basically like, "Oh, it's fine. You're fine, just go over it, just man up and just go. You're all right. It's not real."... So, I do think culture plays a strong role in whether you seek help or not." (Chris, Year 2). There are also many positive remarks towards familial support and effects on MHC like Kristen as she mentioned her parents convincing her sister to start therapy, which normalized getting professional help for a MHC (Kristen, Year 2). Students seemed to navigate the diverse cultural stigmas by choosing the stronger attributes of their culture to approach difficult issues such as MHC seen with Jane, "just being Indian, but born and brought up in America, I feel like there's a lot of confusion with myself, with my culture of what do I really identify with" where she goes on to describe picking aspects that align with her own personal values (Jane, Year 1).

Navigational capital influence and correlation with psychological capital

Navigational capital and psychological capital were seen in three cases. Students utilized positive psychological reframing to navigate engineering environments. The most prominent example of the correlation was seen in Jane stating that, "... with my peers, I feel like there's a lot of... we go through a lot of hard work together and I feel like there's a lot of negativities that stems from that. So, I think that my interactions with them have been trying to be more positive about everything. I think last year I would see all these hard engineering courses as a very negative thing, but now I kind of see them as steppingstones to something more positive" (Jane, Year 2). Not only does she reflect on how she is navigating engineering, but she also mentions a specific positive psychological approach to her courses based on the resilience from her cultural values. This psychological approach made her feel more positive towards the difficult aspects of the engineering degree and in turn had a direct effect on MHC outcomes, causing a decrease in anxiety and self-doubt.

Discussion

Looking at the main research questions for this study, a major limitation was the absence of questions related to culture within the original interviews as well as absence of the types of techniques used in institutional counseling. However, the presence of CCW in the selected cases shows that CCW exists in engineering education even without prompted questions and deserves further exploration. The initial research questions below are only a start to looking into the utilization of CCW in engineering education.

How does resistant capital influence engineering identity to shape students' attitudes toward seeking mental health support?

Evidence was minimal for resistance capital due to secondary thematic analysis being done on interviews not related to the CCW topic; however, there was one student who demonstrated resistance by not interacting with the engineers who made up the majority, relating back to the effects of white masculinity talked about earlier. While limited, this shows evidence that resistance capital is already being applied independently by engineering students as an

approach to their degree which could relate to MHC. In the future we would create directed questions about how the negative stigmas around their culture in engineering affected their MH and their MH help-seeking attitudes.

How do cultural values rooted in familial and social capital influence students' willingness to engage with professional mental health services?

Social and familial capital were the most mentioned throughout the interviews, being seen in all cases for social capital and five for familial capital. This could be because engineering is a heavily social degree which helped encourage these already existing capital ties to socializing as a coping skill. Familial capital showed mixed influence on MH help-seeking tendencies with immediate family support being a big motivator for getting MH help and cultural stigmas possibly deterring students from seeking help. In terms of positive familial impacts, all 8 other cases either mentioned a specific familial impact on MH help seeking attitudes or they said their parents were one of their biggest support systems and that they would go to them in times of MH struggles. With this information, the new round of interviews we hope to conduct will be focused on the students' familial cultural beliefs on MH and compare that with their own MH beliefs and help seeking practices. Similar questions would be asked in terms of social capital, and the results could then be used to look for a correlation in negative familial views with an increase in social capital use in MH to help seeking attitudes as well as a deeper dive into how familial and social capital effect MH help seeking attitudes individually.

In what ways do institutional structures currently support or undermine students' CCW in the context of mental health?

No evidence was found in the cases of institutional structures showing support or undermining cultures due to unspecific question prompts. For the basis of institutional involvement importance, Bensimon's publishing's on equity-mindedness demonstrates how minorities shortcomings at an institution can be considered as the institution being underprepared instead of the students being labeled as "at risk" [11]. This relation to our objective to shift underrepresented communities from "at risk" to an asset rich community verifies the further need for research into institutions current approaches to CCW. To rectify this lack of insight into the institution's approach we would ask questions directed at those students who had gone through the institution's counseling and directed at all students about how they felt the institution did to take their culture into consideration overall.

Conclusion

These preliminary findings offer critical insights for engineering educators and administrators. The most important finding being that there is a presence of CCW already being independently applied by engineering students related to MHC. The repeated mention of social capital suggests that engineering programs would benefit from intentionally structuring collaborative learning from a mental health perspective in addition to a purely technical one. The duality of the familial capital also calls for more culturally competent care from the institutions' MH services as there are many different cultural stigmas the student could be fighting to reach out for help. Moving from a deficit outlook to a CCW asset model, educators, as well as educational institutions, will have a better understanding of how to validate students' backgrounds and use them to their advantage to counteract the deficit nature of engineering culture that leads to increased MHC reported. Rather than viewing underrepresented students as

“at-risk” understanding more about CCW can help intuitions recognize the unique navigational and psychological capabilities these students have. Future work will aim to ask tailored questions towards cultural upbringings and applications of CCW in students’ daily lives to analyze how these assets are applied independently which will inform institutions on how to approach formally facilitating these inherent assets to improve minority MHC in engineering.

References

- [1] S. Lipson, “Major Differences: Variations in Undergraduate and Graduate Student Mental Health and Treatment Utilization Across Academic Disciplines,” *J. Coll. Stud. Psychother.*, vol. 30, no. 1, pp. 23–41, Dec. 2015.
- [2] A. Danowitz and K. Beddoes, “A Snapshot of Mental Health and Wellness of Engineering Students Across the Western United States.”
- [3] A. Danowitz and K. Beddoes, “Mental Health in Engineering Education: Identifying Population and Intersectional Variation,” *IEEE Trans. Educ.*, vol. 65, no. 3, pp. 257–266, Aug. 2022.
- [4] K. Jensen and K. Cross, “Engineering stress culture: Relationships among mental health, engineering identity, and sense of inclusion,” *J. Eng. Educ.*, vol. 110, no. 2, pp. 371–392, May 2021.
- [5] R. Stevens, D. Amos, A. Jocuns, and L. Garrison, “Engineering As Lifestyle And A Meritocracy Of Difficulty: Two Pervasive Beliefs Among Engineering Students And Their Possible Effects,” presented at the ASEE 2007 Annual Conference & Exposition, Honolulu, Hawaii.
- [6] S. Secules, “Making the Familiar Strange: An Ethnographic Scholarship of Integration Contextualizing Engineering Educational Culture as Masculine and Competitive,” *Eng. Stud.*, vol. 11, no. 3, pp. 196–216, Sep. 2019.
- [7] S. Kamal and M. Sanchez-Pena, “A Comparative Analysis of Mental Health Conditions Prevalence and Help seeking Attitudes of Engineering Students at Two Institutions in the U.S.A.”
- [8] T. Yosso, “Whose culture has capital? A critical race theory discussion of community cultural wealth,” *Race Ethn. Educ.*, vol. 8, no. 1, pp. 69–91, Mar. 2005.
- [9] D. Verdin, “Unmasking the Impact of First-Generation College Students Psychological Capital A Person-Centered Approach,” *J. First-Gener. Student Success*, vol. 5, no. 2, pp. 140–163, Sep. 2024.
- [10] V. Braun and V. Clarke, “Using Thematic Analysis in Psychology,” *Qual. Res. Psychol.*, vol. 3, no. 2, pp. 77–101.

[11] E. M. Bensimon, "The Underestimated Significance of Practitioner Knowledge in the Scholarship on Student Success," *Rev. High. Educ.*, vol. 30, no. 4, pp. 441–469, 2027.