

”It’s very important to my professors... at least most of them”: How messages from engineering faculty and staff influence student beliefs around seeking help for their mental health

Natalie Ban

Lordina Odeibea Mensah

Matthew Whitwer

Lucy Elizabeth Hargis

Lucy Hargis is a senior psychology major at the University of Kentucky. She is a research assistant in the P20 Motivation and Learning Lab, which conducts research related to the psychological aspects of teaching and learning.

Ms. Courtney Janaye Wright, University of Kentucky

Courtney Wright is a Counseling Psychology PhD student. She has a BA in Applied Psychology and Human Development and MA in Mental Health Counseling from Boston College. Courtney is the Graduate Research Assistant for Dr. Sarah Wilson’s NSF funded research team.

Dr. Joseph H Hammer

Associate Professor of Counseling Psychology

Dr. Sarah A. Wilson, University of Kentucky

Dr. Sarah Wilson is an Assistant Professor in Chemical and Materials Engineering at the University of Kentucky. She is the director of the Wilson Research Group, where she works to understand and improve mental health in engineering. In this way, she defines mental health as not just the absence of mental illness but a mental state in which engineers can effectively cope with stress, realize their potential, and contribute to society. She is particularly interested in developing and implementing interventions to improve mental health related help seeking in undergraduate engineering students. Sarah graduated with a B.S. in Chemical Engineering from Rowan University and a Ph.D. in Chemical Engineering from the University of Massachusetts. She began her academic career as teaching faculty in Chemical Engineering at the University of Kentucky. As an educator, Sarah works to integrate non-cognitive skills such as creativity, social and emotional intelligence, and communication into her courses. Her experience as a teaching faculty member led her to the development of her research in student mental health, resulting in her transition from teaching faculty to assistant professor with research in engineering education in 2021. She has also co-developed and implemented a workshop on supporting undergraduate student mental health, which has been offered to engineering faculty nationally.

**“It's very important to my professors...at least most of them”:
How messages from engineering faculty and staff
influence student beliefs around seeking help for their mental health**

Abstract

Studies have shown that distressed engineering undergraduates are less likely to seek help for a mental health concern when compared to their non-engineering peers. To understand more about the factors that influence mental health related help seeking in undergraduate engineering students, a qualitative study was conducted based on the integrated behavioral model (IBM). Through this study, 33 students were asked about their beliefs related to seeking help for a mental health concern, as guided by the IBM. The current study aims to characterize the messages that students receive (either explicitly or implicitly) from engineering faculty and staff that might influence their thoughts around help seeking. After qualitative analysis, three common themes were identified: 1) Supportive explicit and implicit messages around help seeking are often tied to an individual faculty or staff member, 2) College level change around mental health is viewed positively if appropriately communicated, and 3) Students perceive lack of flexibility and empathy from faculty as not being supportive of student mental health. The results of the study provide guidance for how engineering faculty and staff can use explicit and implicit messaging to create an environment that is supportive of mental health and professional help seeking.

Introduction

Student mental health is a growing concern as mental health issues such as depression and anxiety become increasingly prevalent on college campuses. Data from national studies has shown an increase in the frequency of depression, from 24.8% in 2009 to 29.9% in 2017, while the percentage of students reporting suicidal ideation increased from 5.8% in 2007 to 10.8% in 2017 [1]. Similarly, anxiety has been seen to increase from 22% in 2014 [2] to 34% in 2021 [3]. Similar increases were seen for student's reported uses of therapy and medication [1]. Untreated and undertreated mental health problems have been linked to poorer academic outcomes [4]. For example, depression has been associated with decreased academic performance and increased dropout rates [4, 5].

Engineering Student Mental Health

While evidence indicates that engineering students do not necessarily experience significantly different rates of mental health conditions compared to other college students, students from different marginalized identities are more likely to be impacted by mental health distress. For instance, female-identified and first-generation [6], and female-identified and gender expansive [7] engineering students are more likely to report symptoms of mental health distress when compared to their peers. Further, a significant percentage of engineering students who self-report symptoms of a mental health concern are not seeking professional help [8]. In a 2021 study of engineering students at eight US universities, 50% of respondents screened positive for at least one diagnosable condition, but only 16% of those respondents had received a mental health diagnosis [9]. Some barriers to mental health related help seeking in engineers have been identified in the literature such as lack of time [10, 11], lack of resources [10], potential impact on future career [12] and normalization of stress [10, 12, 13]. That being said, there is an important need for a comprehensive, theory driven approach to better understand the beliefs and behaviors that influence mental health help-seeking among undergraduate engineering students.

Theoretical Framework: Integrated Behavioral Model

The Integrated Behavioral Model (IBM) is a theory that has been used to understand the underlying beliefs around health behaviors [14]. It states that intention is the most important driver for help

seeking. According to the IBM, intention is guided by attitude, perceived norm, and personal agency, which are themselves informed by indirect beliefs [14]. Attitude is a person's evaluation of help-seeking based on anticipated outcomes of seeking help (outcome beliefs), and emotional responses to the idea of seeking help (experiential beliefs). Perceived norm refers to beliefs about others' expectations for behaviors as well as their beliefs about others' behavior. Finally, personal agency is a person's beliefs about barriers and facilitators to seeking help, and their confidence in their ability to seek help (self-efficacy). This work focuses on the perceived norms related to mental health and help-seeking that influence engineering students' behaviors.

Faculty-Student Interactions

Professors and advisors play an important role in the lives of students. College students have reported on the importance of positive faculty-student relationships and interactions to them and their learning experience, and research has shown that the influences those relationships have on student outcomes are significant [15]. Students' perceptions of instructor supportiveness have previously been found to be based on a variety of factors, including both direct and indirect interactions [16]. When students perceive their professors to be approachable and available for interactions outside the classroom, and to show genuine respect toward them, they report significantly higher motivation and self-confidence in their academic skills [17]. Additionally, when there is a perceived positive relationship, students are more likely to view faculty as a source of support in times of stress [18]. On the other hand, perceived negative relationships are detrimental to the outcomes of both students and instructors [19]. While there has been discussion in the literature on the lack of flexibility or empathy from engineering faculty [12], there has been little else on the influence that faculty and staff might have on student's beliefs about seeking help for their mental health. Therefore, this work highlights how both explicit and implicit messaging from engineering faculty and staff influence student beliefs about seeking help for their mental health.

Methods

Data reported in the present manuscript are derived from a larger mixed-methods project that used the integrated behavioral model to explore undergraduate engineering students' mental health related help-seeking beliefs [11].

Recruitment and Participants

As part of a comprehensive study on engineering undergraduate mental health help-seeking, a total of 33 undergraduate students enrolled in the University of Kentucky College of Engineering were interviewed about their beliefs related to seeking help for a mental health concern. Students were recruited during the Fall of 2020 and the Spring of 2021. To be eligible for participation, students had to be enrolled as an undergraduate student in engineering and be at least 18 years of age. Participants were recruited through two strategies. First, professors of select courses shared information about the study on their respective learning management systems. Additionally, to recruit students with marginalized identities, administrators of identity-based engineering student organizations on campus (e.g., National Society for Black Engineers, Society of Hispanic Professional Engineers and STEMgiQueers) were asked to advertise the study to their group members. The recruitment materials included a video and letter detailing the purpose and voluntary nature of the study. Students who were interested in participating were asked to complete an online pre-screening survey that collected information about their demographics, program of study,

mental health help seeking, mental health distress, and help-seeking intention. A total of 250 responses were collected.

Purposeful stratified sampling was employed to ensure the development of a diverse set of interviewees across major, years of study, gender, race/ethnicity, generational status, history of help seeking, and mental health distress status. Thirty-three students were recruited to participate in an interview, as further described in [11]. As an incentive for participation, each student who completed the interview received a \$50 Amazon gift card.

Data Collection

A semi-structured interview protocol was developed to guide the interviews and promote deep reflection by the participants. Topics outlined by the protocol included stressors experienced by engineering students and their thoughts about mental health help-seeking, making sure to include the key belief categories of the IBM. To promote safety during the COVID-19 pandemic, interviews were conducted virtually via a HIPAA-compliant Zoom account. At the beginning of each interview, the first author reviewed informed consent with participants. All interviews were recorded, lasting between 45 and 70 minutes, and the audio files were transcribed.

Data Analysis

Semantic codes were developed from the content of the interview transcripts for messages related to help seeking that influence undergraduate students' beliefs about the perceived norm around mental health help-seeking. Beliefs related to other factors defined in the IBM, such as personal agency, were not coded for, as that was beyond the scope of this work. An iterative process of generating and refining semantic codes that represented the data was used [20]. First, each interview transcript was read, and references to other people were used to create initial codes related to the person referenced (e.g., engineering faculty/staff, family, friend/partner, etc.). Next, the coded passages were analyzed to identify the presence of a message related to mental health and/or help-seeking. Identified messages were coded with a valence depending on the perceived stance of the message towards mental health and help-seeking (e.g., positive, neutral/mixed or negative). Finally, messages were coded according to the general content of the message for a total of eight descriptive codes.

Themes were developed by combining codes into larger, more meaningful patterns [20]. An inductive approach to developing themes was used, which allowed them to emerge from the data. To facilitate review of the themes and codes, representative quotations were identified that reflected the intended meaning of each theme and were used to help properly define them. For the purposes of this paper, themes were developed specifically around the messages received from engineering faculty and staff members.

Results and discussion

Analysis of the 33 interviews with students resulted in the formation of three themes tied to the influence of faculty and staff messaging around help seeking: 1) Supportive explicit and implicit messages around help seeking are often tied to an individual faculty or staff member, 2) College level initiatives in support of mental health are viewed positively if appropriately communicated and 3) Lack of flexibility and empathy from faculty negatively impacts perceptions around mental health. Through this section, we will discuss these themes and support them through the use of

quotes from the student interviews. Additionally, we will talk about how the knowledge gained through these interviews can help engineering faculty more effectively communicate support around mental health and help seeking.

1. Supportive explicit and implicit messages around help seeking are often tied to an individual faculty or staff member

As previously discussed, faculty members who are viewed as approachable and respectful of students can lead to positive academic outcomes [17] and result in faculty being viewed as a source of support during times of distress [18]. Similar results were found through our interviews with students, where students often connected the positive messages that they received from faculty and staff around help seeking back to specific individuals that they felt truly cared about them as students. For instance, many students talked about the positive messages that they had received from their advisors.

"My advisor was very supportive when I was facing academic challenges. He provided me with a list of resources and encouraged me to get an academic support coach and attend tutoring sessions. He truly wanted me to succeed" (Man, Second Year Computer Engineering).

While the support role that advisors fill is most directly tied to academics, students felt that their advisors were really looking out for them during difficult stages in their college career. Additionally, advisors often have access to knowledge about other aspects of a student's life that might impact their academics. In this way, they have the direct opportunity to ensure that students are receiving the support that they need outside of their academics. For instance, one student talked about their advisor checking in about their help seeking after seeing a letter from the university's disability resource center.

"In advising sessions I've had my advisors like, 'hey, are you seeing help? I see you have a letter. Are you dealing with that?'" (Agender, First Year Mechanical Engineering).

Overall, all students who talked about engineering advisors had positive things to say about the support they received and how that might impact their mental health related help-seeking. On the other hand, student's experiences with faculty were more mixed.

"Advisors are very sympathetic... The instructors are hit or miss. I think I've had about three or four that actually appear to be humans and want to help you and will talk to you if you're having trouble" (Woman, Second Year Materials Engineering).

Like advisors, students often linked the positive messages that they received from faculty with individual faculty members that had taken the time to show that they care about the student and their success. For example, one participant shared that their professor made a point at the beginning of the semester to let her students know that she will advocate for their mental well-being and help them find campus resources for professional help.

"You can tell that she cares about her students as more than just students... At the beginning of every semester, she makes sure to be very specific like 'if you need help you can come to me. If you don't feel comfortable coming to me, these are all the campus resources we have. If you are ever feeling stressed, overwhelmed, all that sort of stuff, there are people here who are available and willing and really want to talk to you.' And so, I think that with her specifically, she has been a very big advocate

for being very mentally healthy and making sure that she acknowledges that this is not an easy major and that this class is not going to be easy. But making sure that she can do everything she can to make it as easy as possible or make it as less overwhelming as it can be” (Woman, Third Year Materials Engineering).

By taking the time to explicitly state in class that mental health of students is the priority over their academics, this faculty member was able to show students that she cared about their well-being. In doing this, she still acknowledged that the students would likely face challenges across the semester but made sure that they also knew that there were resources available to support them.

While some faculty share explicit messages related to supporting mental health, others show their empathy for students by being understanding and providing flexibility, when possible, to help to reduce student stress levels.

“I just feel like it's the way a lot of the professors handle their classes that I think that they would be supportive. For example, Dr. ____...she's pretty empathetic and understanding. She's definitely going to challenge us and teach us the content. She's not going to shy away from that but, for example, she understands... our design project is due on a certain day and I think she's already canceled class for that day. So if she's willing to bend and make up time and other lectures so we can have time to finish the project, so we're not overwhelmed...it's just things like that. That made me think...when the professors are empathetic that they would be supportive” (Genderqueer, Fourth Year Chemical Engineering).

Once again, this student recognizes that this professor is still going to challenge them to get through difficult course content but they will also be understanding of the stresses that students experience across the semester. While not explicitly showing that mental health is prioritized, the empathy this professor had for students communicates their support for student’s overall well-being. On the other hand, explicit messages about overcoming challenges can also show students support.

“I've had someone in particular that has always been very, very human about seeking help and makes us feel like you know, even if we're doing poorly in the class and it feels like something slipping away, we're still OK. We can still get help” (Man, Second Year Civil Engineering).

Here, the faculty member specifically communicates that even though students might face academic challenges, they still have resources that they can use to help them. This messaging can help to normalize the act of seeking assistance when faced with challenges.

2. College level initiatives in support of mental health are viewed positively if appropriately communicated

As cultural changes surrounding mental health within engineering are implemented and faculty continue to have more conversations with students about mental health, students report feeling more supported by the College as a whole. One participant mentioned feeling supported by the leadership within the College, in addition to the faculty, which made them feel like the engineering environment has become more accepting and faculty have become better advocates for student mental health.

“I do think that there's a big community within the College of Engineering who very much advocate for mental health and advocate for seeking help. It's very important that it's also in the leadership in

our College. I know a lot of academic advisors, at least in my experience, have made sure that everybody knows about the different things that our University has to offer. The different kind of wellness centers and everything, and I think that it's really important that the leadership specifically is a very big advocate for mental health” (Woman, Third Year Materials Engineering).

Another participant shared that most of their professors are very helpful and supportive of help seeking. In particular, students have mentioned the mental health section of the syllabus and how some faculty have effectively used this to communicate their support for student mental health and help seeking.

“My professor’s first day of class...there will be a mental health section on the syllabus, ‘So if you need help this is a number you can call. Here's the counseling address. Here's who you can talk to on campus for free,’ and then, throughout the semester when the stress is higher, they’ll emphasize it to make sure that you know what help is out there. I have teachers who would love it if a student who's struggling would come up to them and ask them for mental health [help]. It's very important to my professors...at least most of them. If someone who's struggling would come up to them for help and they would be overly willing to help them talk to someone, go get help from someone. Overall, that is a very positive...very helpful, very supportive people” (Woman, Fourth Year Mechanical Engineering).

While many students had positive things to say about College level changes, some students felt like the messages they were receiving in the classroom were just “policy” rather than faculty really caring about their students. Students talked about the difference between those faculty who just mentioned mental health resources on syllabus day vs. those that talked about it more consistently throughout the semester.

“From my experience, a lot of professors encourage it...some more than others. Some only do it in the beginning of the semester when they're going through the course syllabus. They'll give us resources, and only a couple pushed that throughout the semester. But I would say almost every single one of my professors has given us resources for mental help” (Woman, Fourth Year Chemical Engineering).

Students felt that a lack of vulnerability and heart in the way that professors deliver the information from the syllabus to their students can cause mixed perceptions of the level of support that would be received.

“I feel like only a few - estimating roughly 30% - would have a sort of human, character driven, response in saying those words. A lot of it is just policy and memorization, and some engineering instructors...don't really like to think about that, in sort of that... academic strongpoint, self-integrity, weak point mentality” (Man, Second Year Civil Engineering).

While talking about mental health and implementing College level changes is important, it is also important that faculty think about how their messages around mental health resources are being received.

3. Students perceive lack of flexibility and empathy from faculty as not being supportive of student mental health

Several students talked about how their professors often show a lack of flexibility in their courses unless there is a “valid excuse.” As a result, students perceive that missing an assignment or a class

for a mental health reason might not be viewed as acceptable. Similarly, those students that had previous negative experiences related to obtaining flexibility within a course talked about how much harder it would be if they were struggling with their mental health.

“I had a conflict with one of my professors... he had a problem when I missed an exam...I had to talk to the ombud and jump through a bunch of hoops until he would let me take the exam. That was something where I was like, ‘OK if someone was having a mental health concern, the amount of rejection that I faced trying to go through that...would be even more difficult if it was a personal mental health issue and you didn't really want to talk about it” (Man, Second Year Computer Engineering).

While positive messages around help seeking were often tied to individual faculty members, students often generalized negative messaging to all faculty. Because of negative experiences with individual faculty members, students often have the perception that engineering faculty more broadly only care about their academics. They perceive that faculty don't care about anything else that might be going on in their lives that might impact their ability to complete an assignment.

“I feel like you just have to get stuff done. The professors think like no matter what the excuse is, you just have to be able to get the work done. It doesn't matter how you're doing, just get it done and do well” (Woman, Second Year Materials Engineering).

“I have had professors who are like, ‘nope, you had time to do this.’ They don't care what's going on in your personal life” (Woman, Third Year Materials Engineering).

Because many students have had previous negative experiences with faculty who were unwilling to provide flexibility in their courses, they often have the perception that faculty do not care about anything outside of what would be considered an “excused absence” by the university. This lack of flexibility from faculty in engineering has been identified in other studies on mental health in engineering [12]. Because students perceive that faculty would not accept mental health as a reason for not performing academically, students can feel as though they must put aside their concerns and focus solely on their academic responsibilities.

In a similar way, some students have had negative experiences with faculty where they felt like they were not respected. These experiences can result in students feeling a lack of support and feeling like those faculty would not care about their mental health. Additionally, some students talked about the expectations that faculty place on students that can result in them feeling like they have to be perfect.

“Some of the engineering professors...say, “if you can't make it through this class, you're not engineer. If you can't do this, you're not an engineer,” and I think that just puts a lot of pressure on [students] to be perfect. So, [students] think going to see someone lowers our level of perfection. And I think it leads to a lot of them, just kind of dealing with it themselves instead of seeking help” (Woman, Fourth Year Computer Science).

Faculty sending messages that struggle or challenge in a difficult academic setting means that they are not fit to be an engineer results in significant pressure on students to be perfect. Further, the notion that seeking help might be a sign of imperfection could lead to students dealing with mental health issues on their own instead of seeking help.

Conclusions and implications

Through qualitative analysis of 33 interviews, this paper identified three themes associated with engineering faculty and staff messages around seeking help for mental health: 1) Supportive explicit and implicit messages around help seeking are often tied to an individual, 2) College level change around mental health is viewed positively if appropriately communicated and 3) Lack of flexibility and empathy from faculty negatively impacts perceptions around mental health. Together, all three themes highlight the importance of faculty and staff showing empathy and prioritizing the student over the academics. Because the culture of engineering has been described as “hard” and unemotional [21], faculty who display empathy and priority of the individual as a whole human being can help to challenge these cultural norms. There is significant literature to show the positive impact that faculty interaction can have on students [22]. There is further literature to show the importance of these relationships for improving student outcomes for highly challenging courses [23], STEM disciplines, as well as students who are traditionally excluded from engineering [24], including Latinx students [25] and Native American students [26]. Therefore, communicating care for the individual student has the potential to not only impact academic outcomes but also has the potential to change the narrative around mental health in engineering.

The conversations with undergraduate engineering students presented here highlights the importance of faculty and staff going against the cultural norms in engineering to introduce compassion, emotion, and empathy into their engagement with students. The literature supports that students expressed higher satisfaction with faculty who they felt were approachable, helpful, understanding and encouraging rather than remote, discouraging and unsympathetic [27]. This is in line with our findings where faculty who held these characteristics were more likely to be viewed as supportive of the overall individual, including that individual’s mental health and wellness. Through development of supportive relationships with students, faculty and staff can send both explicit and implicit messages to students that help to normalize the prioritization of mental health and mental health help seeking. While this work aimed to understand factors that influence the beliefs that students have around mental health and help seeking, future work will aim to understand which key factors are predictive of student help-seeking behavior. In this way, future work will allow for development of targeted interventions aimed at improving help seeking in the undergraduate engineering student population.

References

- [1] S. K. Lipson, E. G. Lattie, and D. Eisenberg, "Increased Rates of Mental Health Service Utilization by U.S. College Students: 10-Year Population-Level Trends (2007–2017)," *Psychiatric Services*, vol. 70, no. 1, pp. 60-63, 2019/01/01 2018, doi: 10.1176/appi.ps.201800332.
- [2] D. Eisenberg *et al.*, "The Health Minds Study: 2014 Data Report," 2014.
- [3] D. Eisenberg, Lipson, S. K., Heinze, J., Zhou, S., Talaski, A., & Patterson, A, "The Healthy Minds Study: 2021 Winter/Spring Data Report.," 2021.
- [4] D. Eisenberg, M. F. Downs, E. Golberstein, and K. Zivin, "Stigma and help seeking for mental health among college students," *Medical Care Research and Review*, vol. 66, no. 5, pp. 522-541, 2009.
- [5] R. Bruffaerts *et al.*, "Mental health problems in college freshmen: Prevalence and academic functioning," *Journal of affective disorders*, vol. 225, pp. 97-103, 2018.
- [6] K. J. Jensen and K. J. Cross, "Engineering stress culture: Relationships among mental health, engineering identity, and sense of inclusion," *Journal of Engineering Education*, vol. 110, no. 2, pp. 371-392, 2021, doi: <https://doi.org/10.1002/jee.20391>.
- [7] L. E. W. Hargis, Courtney J.; Miller, Melanie E.; Usher, Ellen E.; Hammer, Joseph H.; Wilson, Sarah A., "Relationship Between Mental Health Distress and Help-Seeking Behaviors Among Engineering Students," in *American Society for Engineering Education Annual Conference*, 2021.
- [8] S. K. Lipson, S. Zhou, B. Wagner, K. Beck, and D. Eisenberg, "Major Differences: Variations in Undergraduate and Graduate Student Mental Health and Treatment Utilization Across Academic Disciplines," *Journal of College Student Psychotherapy*, vol. 30, no. 1, pp. 23-41, 2016/01/02 2016, doi: 10.1080/87568225.2016.1105657.
- [9] A. Danowitz and K. Beddoes, "Mental Health in Engineering Education: Identifying Population and Intersectional Variation," *IEEE Transactions on Education*, vol. 65, no. 3, pp. 257-266, 2022.
- [10] K. Jensen, E. Johnson, J. Mirabelli, and S. Vohra, "CAREER: Characterizing undergraduate engineering students' experiences with mental health in engineering culture," 2022.
- [11] C. J. M. Wright, Melanie E.; Hargis, Lucy E.; Usher, Ellen E.; Hammer, Joseph H.; Wilson, Sarah A., "Identifying Engineering Students' Beliefs About Seeking Help for Mental Health Concerns," presented at the American Society for Engineering Education Annual Conference, Virtual, 2021.
- [12] K. Beddoes and A. Danowitz, "In their own words: How aspects of engineering education undermine students' mental health," 2022.
- [13] K. Jensen and K. J. Cross, "Work in progress: Understanding student perceptions of stress as part of engineering culture," 2018.
- [14] D. E. Montano and D. Kasprzyk, "Theory of reasoned action, theory of planned behavior, and the integrated behavioral model," *Health behavior: Theory, research and practice*, vol. 70, no. 4, p. 231, 2015.
- [15] V. P. Richmond, J. C. McCroskey, and T. Mottet, *Handbook of instructional communication: Rhetorical and relational perspectives*. Routledge, 2015.

- [16] E. E. Schussler, M. Weatherton, M. M. Chen Musgrove, J. R. Brigati, and B. J. England, "Student perceptions of instructor supportiveness: What characteristics make a difference?," *CBE—Life Sciences Education*, vol. 20, no. 2, p. ar29, 2021.
- [17] M. Komarraju, S. Musulkin, and G. Bhattacharya, "Role of student–faculty interactions in developing college students' academic self-concept, motivation, and achievement," *Journal of college student development*, vol. 51, no. 3, pp. 332-342, 2010.
- [18] A. L. Meluch and S. C. Starcher, "College student concealment and disclosure of mental health issues in the classroom: Students' perceptions of risk and use of contextual criteria," *Communication Studies*, vol. 71, no. 5, pp. 768-782, 2020.
- [19] B. N. Frisby, A. K. Goodboy, and M. M. Buckner, "Students' instructional dissent and relationships with faculty members' burnout, commitment, satisfaction, and efficacy," *Communication Education*, vol. 64, no. 1, pp. 65-82, 2015.
- [20] V. Braun and V. Clarke, *Thematic analysis*. American Psychological Association, 2012.
- [21] E. Godfrey and L. Parker, "Mapping the Cultural Landscape in Engineering Education," *Journal of Engineering Education*, vol. 99, no. 1, pp. 5-22, 2010, doi: <https://doi.org/10.1002/j.2168-9830.2010.tb01038.x>.
- [22] Y. K. Kim and L. J. Sax, "The impact of college students' interactions with faculty: A review of general and conditional effects," *Higher education: Handbook of theory and research: Published under the sponsorship of the Association for Institutional Research (AIR) and the Association for the Study of Higher Education (ASHE)*, pp. 85-139, 2017.
- [23] M. Micari and P. Pazos, "Connecting to the professor: Impact of the student–faculty relationship in a highly challenging course," *College Teaching*, vol. 60, no. 2, pp. 41-47, 2012.
- [24] M. T. Eimers, "The impact of student experiences on progress in college: An examination of minority and nonminority differences," *Journal of Student Affairs Research and Practice*, vol. 38, no. 3, pp. 372-395, 2001.
- [25] J. C. Hernandez, "Understanding the retention of Latino college students," *Journal of College Student Development*, 2000.
- [26] K. Swisher, "American Indian/Alaskan Native Dropout Study," 1991.
- [27] C. A. Lundberg and L. A. Schreiner, "Quality and frequency of faculty-student interaction as predictors of learning: An analysis by student race/ethnicity," *Journal of College student development*, vol. 45, no. 5, pp. 549-565, 2004.