2026 ASEE ANNUAL CONFERENCE June 21–24, 2026 | Charlotte Convention Center, NC
Host Sponsor UNC Charlotte
ASEE AMERICAN SOCIETY FOR ENGINEERING EDUCATION
Paper ID #50140

Integrating Social-Emotional Learning into a Disciplinary Engineering Course

Prof. Susan P. Gentry, University of California, Davis

Prof. Susan P. Gentry is an Associate Professor of Teaching Materials Science and Engineering at the University of California, Davis. In her current position at UC Davis, she is integrating computational modules into the undergraduate and graduate materials science and engineering curriculum.

Integrating Social-Emotional Learning into a Disciplinary Engineering Course

Abstract

The Social-Emotional Learning (SEL) framework is promoted within primary and secondary education, and research has shown that SEL interventions can improve student learning. SEL has five competencies for students: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. A growing number of engineering educators are integrating wellness instruction into their courses, but rarely adopt the SEL framework. This paper documents a series of wellness modules integrated into a disciplinary, upper-division engineering course to promote students' wellness. Five minutes of class time were dedicated to five wellness topics over the quarter, with topics including the PERMA model, box breathing, and effective communication. Where appropriate, the modules linked wellness topics to skills required for success in the engineering workforce, such as parallels between personal time management and goal planning. A survey found that many students were already familiar with the wellness strategies and felt they were relevant to engineering success. Additionally, no students reported that the modules detracted from their learning. The analysis will guide the future development of these modules.

Introduction

Students' well-being and thriving are a major crisis in engineering education. Engineering education studies have detailed the depth of concerns for students' mental health. For instance, a quantitative study of first- and second-year engineering students at five institutions found that more than half (55%) were experiencing moderate psychological distress, while 28% screened for a diagnosable mental health condition [1]. Additionally, Asghar et al. identified stress as the most prevalent mental health concern among engineering students, according to a systematic literature review of 34 papers [2]. That work also found that disciplinary norms and workload reinforce stress and poor mental health. Jensen and Cross studied this "stress culture," finding that students were more likely to experience mental health distress if they had a weaker engineering identity or experienced lower feelings of inclusion in their department [3]. However, investigations of mental health do not need to be limited to diagnoses and negative effects.

A positive psychology perspective informs this project's approach to addressing wellness. The American Psychological Association defines well-being as "a state of happiness and contentment, with low levels of distress, overall good physical and mental health and outlook, or good quality of life" [4]. Positive psychology emphasizes thriving and positive mental well-being rather than solely negative psychological diagnoses [5, 6]. Martin Seligman championed positive psychology over twenty years ago, but it has been slow to be addressed within the engineering education community. Asghar et al. found that the majority of engineering education papers approached wellness from a negative perspective; only ten of the 34 studies investigated positive impacts [2]. In an editorial, Asghar and Minichello called on researchers to adopt a more balanced view of mental health in engineering education [7].

University faculty have increasingly implemented evidence-based modules to support students' wellness, ranging from extracurricular mindfulness training workshops that enhance participants'

interpersonal competence [8] to dedicated wellness courses [9]. However, stand-alone programs often face significant hurdles. Wright et al. identified the heavy workload and culture of engineering programs as barriers to students seeking help [10]. To address these availability constraints, some educators are shifting toward integrating wellness directly into the engineering curriculum. Blackburn-Lynch and Sleep, for example, integrated wellness modulus based on positive psychology into the classes of a first-year engineering program [11]. Similarly, mental health action plans were incorporated into weekly assignments in engineering design and ethics courses [12]. Collectively, these efforts represent a growing movement to implement curricula for supporting engineering students' well-being.

Social-Emotional Learning

This work advocates for applying the social-emotional learning (SEL) framework to engineering education. SEL is a wellness framework commonly used in primary and secondary education. As promoted by the Collaborative for Academic, Social, and Emotional Learning (CASEL), SEL has five foci [13]:

- **Responsible decision-making:** Using critical thinking and reasoning to solve personal and academic problems, such as considering ethics and social well-being,
- **Relationship skills:** Interacting with others to have supportive personal relationships and to contribute effectively within a team,
- **Social awareness:** Understanding the diverse backgrounds and perceptions of people, including recognizing the strengths of others,
- **Self-awareness:** Recognizing one's attitudes and how these can affect their actions and academic performance, and
- **Self-management:** Adjusting and controlling one's attitudes and emotions, and setting and achieving goals.

CASEL emphasizes the importance of broad support for these wellness areas. Instruction can occur in the classroom, but the school should emphasize these principles while families and communities provide additional assistance [13]. SEL is a tiered wellness approach that recognizes the unique capacities of each level of support.

SEL has been widely adopted and studied in primary and secondary education, with some states, such as California, adopting voluntary SEL competencies [14]. A meta-analysis found that SEL increased students' academic performance by 11 percentile points as measured using objective scores such as standardized tests and school grades [15]. That study found that school personnel (including teachers) gave effective SEL instruction [15]. Research has also shown that SEL instruction improves student well-being, increasing positive social behavior (e.g., cooperation) and decreasing emotional distress [16]. There is extensive evidence of SEL's positive impacts on academic performance and well-being. Surprisingly, it is used infrequently in engineering. A search of papers published on the American Society for Engineering Education (ASEE) Papers on Engineering Education Repository (PEER) [17] revealed only 28 papers on "social-emotional learning" as compared to 2,756 papers on "well-being." SEL presents a promising, under-utilized framework for improving mental health outcomes among engineering students.

Wellness Modules

This study integrated brief wellness modules into a disciplinary engineering class. These modules provided instruction on SEL topics and encouraged students to apply wellness strategies. Each of the five modules was presented as a five-minute segment at the beginning of an 80-minute lecture. Table 1 lists the modules, the week of the quarter, and their corresponding SEL competencies; longer descriptions follow in this section. The topics of motivation, time management, and communication were adapted from a larger one-unit wellness course [9]. The instructor did not provide additional information to the students outside the modules.

Table 1. List of wellness module topics along with the week of the term and SEL competencies

Module	**Week of Term**	**SEL Competencies**
PERMA Model of Well-being	1	Self-Awareness, Self-Management
Intrinsic and Extrinsic Motivation	3	Self-Management
Time Management and Weekly Plans	5	Self-Management
Effective Communication	8	Relationship Skills
Positive and Negative Stress/Box Breathing	9	Self-Management

Distribution of the wellness modules was spread across the ten-week quarter. The PERMA model was selected as the first topic because wellness is extended beyond positive emotions. It was utilized as the foundation for the modules that followed. For the second topic, motivation, the instructor aimed to help students develop effective strategies for completing their work. The third module on time management took place when students' courses had fully ramped up, and students often felt the burden of their total workload. The effective communication module occurred during the week after students' interim group presentations, a period when heightened group tensions are often experienced. Finally, stress and box breathing were reserved for the end of the quarter to help students manage the high levels of stress associated with their impending final projects and exams. The specific arrangement of topics matched the target class, but could be adjusted for other contexts.

This paper addresses the implementation of these modules in a materials selection course at a research-intensive (R1) university. This upper-division engineering course focused on the Ashby method of materials selection [18]. The graded assignments included homework, an exam, and quarter-long group projects. The 4-unit course was required for materials science and engineering majors and was an elective for mechanical engineering and chemical engineering majors. In Fall 2025, the course enrolled 32 students, primarily juniors and seniors.

Module 1: PERMA Model of Well-being

The first module presented an illustration [19] introducing the PERMA model of well-being. The PERMA model [5, 6] is based on positive psychology and identifies five components of well-being:

- **Positive Emotions:** Feelings such as happiness, enjoyment, and optimism,
- **Engagement:** Being absorbed in a task using one's skills,
- **Relationships:** Supportive interactions with others,
- **Meaning:** Having a sense of purpose, and
- **Accomplishment:** Developing mastery and achieving goals.

The PERMA model aims to expand one's perspective on well-being beyond positive emotions and to recognize the contributions of the other four components. I used the PERMA model to underscore the significance of mental health in engineering and motivate the inclusion of well-being topics throughout the term.

Module 2: Intrinsic and Extrinsic Motivation

The second module discussed the importance of motivation and strategies to improve it. Anecdotally, students often identify a lack of motivation to complete tasks as a barrier to academic success; this aligns with research showing that motivation improves academic performance and study skills [20]. First, I discussed the differences between intrinsic motivation, when a task is done for one's internal satisfaction, versus extrinsic motivation, when a task is done to receive a reward or avoid a penalty [21]. Intrinsic motivation helps learning, but students do not always have it for their coursework. However, a person can develop motivation. Learning about a subject and completing tasks can develop intrinsic motivation, even if a person begins with extrinsic motivation [21]. For instance, a student may complete a project on atomic diffusion to fulfill a course requirement, but may develop intrinsic motivation after learning how it applies to lithium-ion batteries. In this module, I also offered practical suggestions for maintaining daily motivation to accomplish tasks, such as taking care of oneself (e.g., sufficient sleep, healthy eating), tackling hard tasks early in the day, and maintaining a schedule. Additionally, I promoted the idea of identifying "treats" to give oneself after hard or avoidance tasks, such as calling a friend after completing the data analysis for a lab report. The module included suggestions for healthy, frugal treats that can be done daily, such as going for a walk, watching a TV show, playing with a pet, or helping out with the family. I also shared that I routinely use these "treat" habits to boost my motivation.

Module 3: Time Management and Weekly Plans

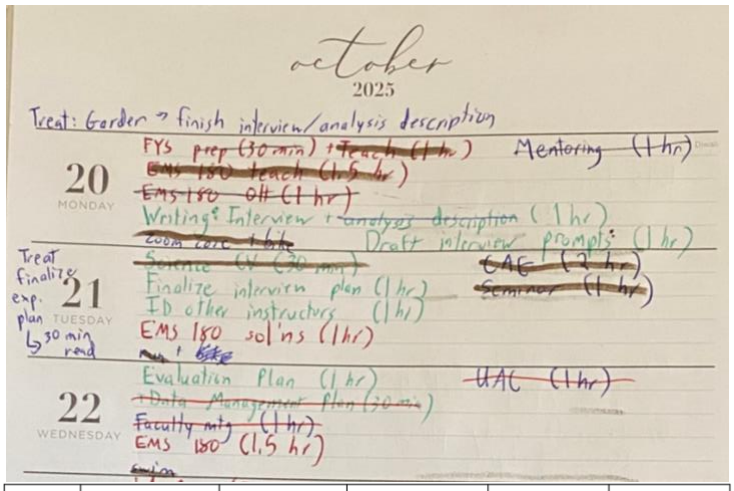
Adequate time management is important for completing tasks and making time for mental health. This session adapted the time-management quadrants popularized in *The 7 Habits of Highly Effective People*. As shown in Table 2, a person can assign tasks to one of four time management quadrants based on their importance and urgency [22]. The goal of time management is to situate oneself so that one spends much of their time on Quadrant II tasks, rather than the other quadrants. Self-care and personal goals were explicitly included in Quadrant II, so that students could see they are important and support their effectiveness. The time management quadrants framed the importance of prioritizing tasks. Time management is not just about fitting more things into each week, but about making sure the *right* time is spent on the *right* tasks.

Table 2. Time management quadrants, adapted from Ref. [22].

	Urgent	**Not Urgent**
Important	**I: Necessity** • Cramming for exams • Last-minute homework and reports • Unforeseen problems	**II: Effectiveness** • Working towards important goals • Reviewing course notes daily • Self-care and personal goals
Not Important	**III: Distraction** • Needless interruptions • Unimportant email, tasks • Other people's issues	**IV: Waste** • Trivial work • Avoidance activities • Excessive relaxation • Internet browsing and social media

Students were also encouraged to create a weekly work plan. The weekly plan begins with a skeleton with tasks that *must* be completed, such as exams, class, and work responsibilities. Then, other tasks and goals (e.g., studying, time with friends) are added. The aim is for the weekly plan to be a realistic plan of each day's tasks. I recommended that students estimate how long each task would take and be careful about the number of hours they allocated to classwork each day. As part of the weekly plan, students were encouraged to consider the four time-management quadrants by identifying items that could be eliminated or reduced, or by managing their expectations. Two sample weekly plans were shared with the students (Figure 1) to show different methods of creating a weekly plan. The instructor's partial weekly plan (Figure 1a) lists daily tasks with time estimates, and Figure 1b shows how a student can slot their tasks into a daily schedule.

(a)



(b)

Hours	Monday	Tuesday	Wednesday	Thursday	Friday
8 AM	Exercise	Chem Lec + quiz	Exercise	Chem Lecture	Exercise
9 AM	Chem Pre-lab		English reading		Math study group
10 AM	FYS	Math Homework	Review Math	Chem post-lab	Chem Office hours
11 AM	Chem Lab				reading
12 PM	Practice quiz	Walk/Lunch	Lunch/Talk	Walk/Lunch	Walk/Lunch
1 PM	English	Review Chem	English	English reading	English
2 PM	Talk w/ friend	Math HW	Chem HW + read book		Chem HW + read book
3 PM	Math	Math		Math	
4 PM	Rough outline for term paper	Find citations to add to outline	Math Discussion		FYS HW
5 PM					
6 PM	Family Dinner	Family Dinner	Family Dinner	Family Dinner	Family Dinner

Figure 1. Sample weekly plans shared with students, showing (a) a list of tasks per day, with a time estimate, and (b) tasks assigned to specific time slots (Unpublished image courtesy of Julia Chamberlain).

Module 4: Effective Communication

Group projects, such as those in the target course, can exacerbate communication challenges and lead to difficult relationships. Group members may have different expectations regarding deadlines and meetings, or may be more or less active on their group's communication platform (e.g., Discord, text messages, emails), which can lead to conflict when finalizing deliverables. To support the groups, I discussed the three elements of effective communication: the message sent, the receiver's acknowledgement that the message was received, and the time frame over which the information is transferred. Shortcomings in any of these components can break down communication. For instance, if a member does not acknowledge a message setting a meeting time, the group may be concerned whether the person will attend the meeting. Additionally, I shared with the students about four different communication styles [23]:

- **Directors**: Decisive, results-driven leaders who may prioritize action and goal completion over social interaction and interpersonal sensitivity.

- **Expressers:** Animated communicators who think out loud but may struggle with organization.
- **Harmonizers**: People who work to bring members together to a mutually agreeable solution.
- **Thinkers**: Deliberate workers who consider all the details when solving a problem, but may underestimate the time required to complete their work

People may have a primary and secondary communication style, or change their style in different contexts. Within a group, multiple communication styles may be present, so members should standardize their expectations. For instance, a group member who is an Expresser should ensure that a Thinker is allowed to contribute their ideas. Finally, I also addressed the importance of normalizing expectations and priorities within the group. A frequent concern surrounds the completion of group members' work in advance of deadlines and meetings. Clearly articulating the work that needs to be completed before meeting times can help clarify whether group members are meeting expectations for their contributions to the group project.

Module 5: Positive and Negative Stress/Box Breathing

Stress can have both positive and negative impacts on people. This module featured two excerpts from a brief online video on the effects of stress (see 0:00-1:30 and 2:58-4:20 of the linked video) [24]. Stressful situations can trigger physiological responses, such as the release of cortisol, which can lead to sweaty palms and an increased heart rate [24]. Low to moderate levels of stress can promote engagement with situations, improving performance. This positive stress, called eustress, is "a type of stress that results from challenging but attainable and enjoyable or worthwhile tasks" [25]. For instance, the cortisol released during a stressful exam can increase oxygen delivery to the brain [24]. This module aimed to help students recognize that their stress symptoms may have a positive benefit and that they do not need to avoid all stressful situations.

Students were also introduced to box breathing, a common stress management technique. A video shared the benefits of box breathing, such as reduced stress and increased oxygen intake [26]. It also instructed viewers on how to practice the technique. Box breathing was selected as an appropriate stress-management technique because it does not require a specific environment or training, and students can easily practice it before stressful assessments such as exams and oral presentations.

Survey Methods

At the end of the quarter, students were surveyed about seven wellness topics: the PERMA well-being model, daily motivation, weekly plans, task prioritization, positive and negative stress, box breathing, and effective communication. Several lessons integrated multiple topics (e.g., Module 5 addressed positive and negative stress and box breathing), but the survey treated these as distinct items. To ensure consistent terminology, the survey included a brief description of each topic. The instrument asked students to rate their prior familiarity and perceived engineering relevance of each topic using a 5-point Likert scale. Additionally, respondents reported whether these modules detracted from their learning of the course content. Finally, demographic information was collected from all participants. A copy of the survey is included in the appendix.

The campus Institutional Review Board (IRB) classified this project as non-human subjects research.

27 of 32 students submitted in-class paper surveys anonymously. The respondents were evenly split (50%) between men and women (of the 24 who reported their gender); no respondents identified as transgender man, transgender woman, non-binary, or other. Of the 23 participants who indicated their race/ethnicity, the majority were Asian/Asian American (52%), with fewer participants who were White or European (35%), Hispanic or Latino/a (22%), or Black/African American (4%). Some participants selected multiple races/ethnicities, and no participants identified as American Indian or Alaska Native, Middle Eastern or North African, Native Hawai'ian or Pacific Islander, or other. No other demographic information (e.g., academic year) was not collected.

Results

Students were polled about their familiarity with the wellness topics presented in class (see Figure 2); 27 students responded. Two-thirds of students were unfamiliar with the PERMA model of well-being, a broad psychological framework. However, students were more familiar with the other specific wellness topics covered in class. Weekly plans and task prioritization were the most familiar topics to students, with 89% of respondents indicating they were "moderately," "very," or "extremely" familiar with both; the average Likert score was 3.7 for both. Similarly, effective communication and daily motivation were familiar to 85% and 78% of respondents, respectively, as measured by the same three scales. However, both topics had higher percentages of students who were only "moderately familiar" with them, resulting in average scores of 3.3 and 3.2 for effective communication and daily motivation, respectively. Finally, positive and negative stress, as well as box breathing, were familiar to only 59% and 48% of respondents, respectively. These results indicate that the students were most familiar with wellness topics aligned with engineering student outcomes (e.g., project management, communication). Still, students also had some familiarity with psychology-based wellness interventions (e.g., box breathing).

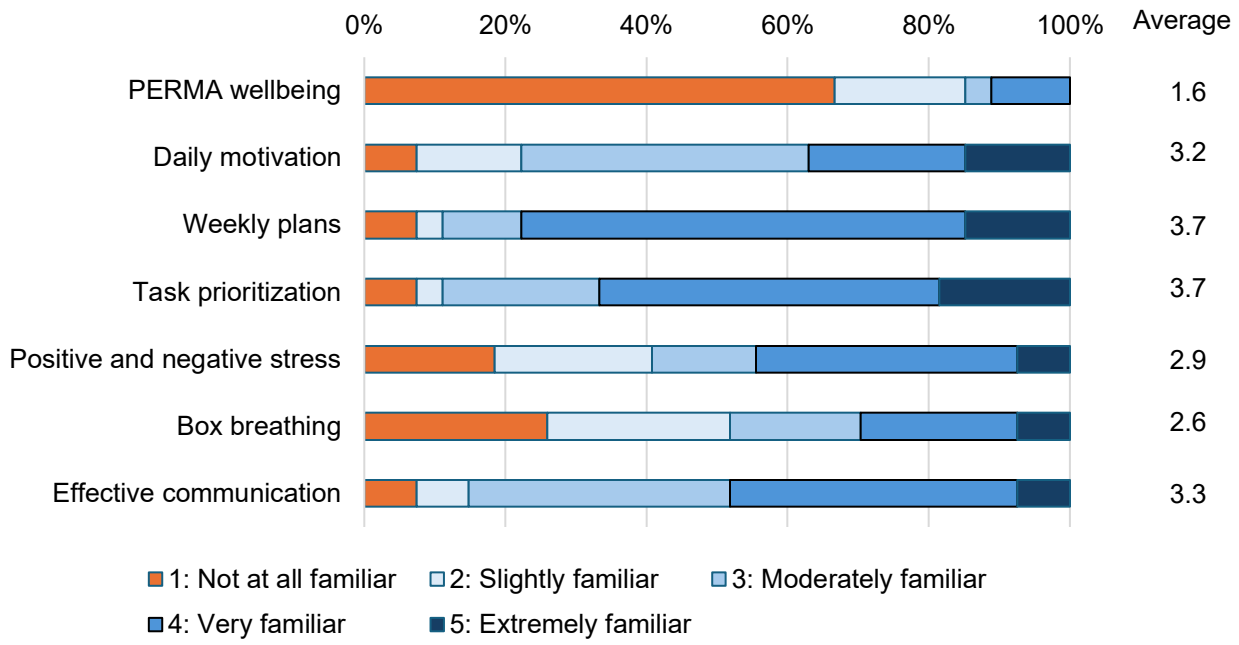


Figure 2. Students' prior familiarity with the wellness topics presented in class (27 responses).

Although students were generally familiar with the wellness topics, there were differing perceptions of whether the topics are relevant to engineering success (see Figure 3). Of the 25 responses, eighty percent strongly agreed that effective communication is important, with 96% either somewhat or strongly agreeing. Similarly, 88% to 96% of students agreed that topics related to planning projects and achieving goals, such as daily motivation, weekly plans, and task prioritization, were relevant. The three wellness topics had more varied responses. Most students (84%) agreed that positive and negative stress were important, and a smaller majority (62%) agreed that the PERMA well-being model was relevant. However, box breathing, which is a stress management technique, was the most divisive topic. Only 40% of students agreed that box breathing was important, while 16% disagreed. This topic also had the highest fraction of students who neither agreed nor disagreed. Overall, students viewed the wellness topics as impacting their engineering success.

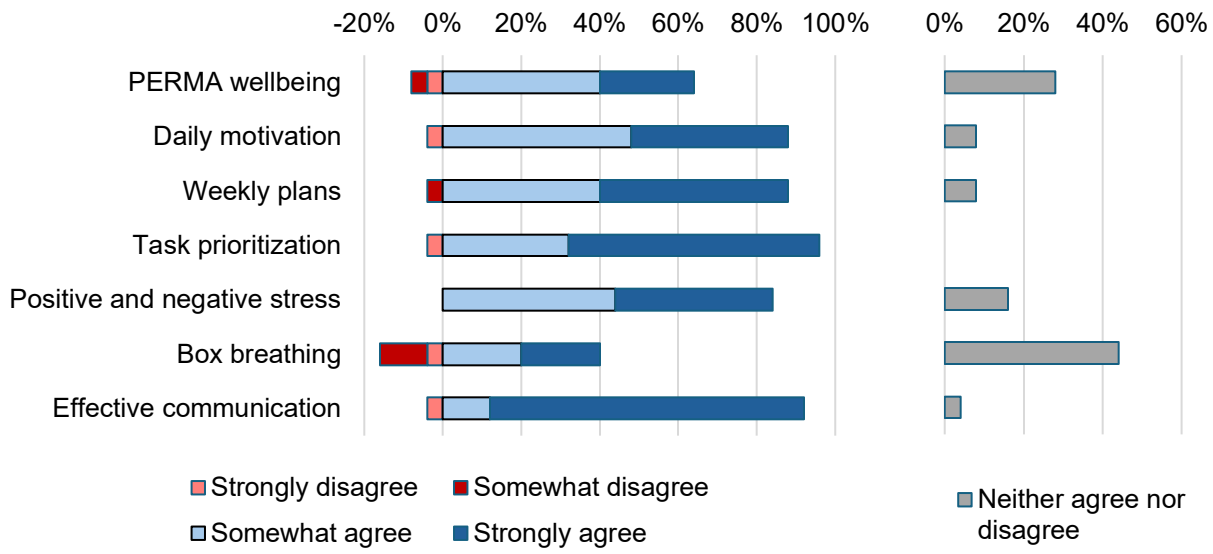


Figure 3. Student perceptions as to whether specific wellness topics are relevant to engineering success (25 responses).

Finally, the students did not perceive these modules as detracting from their learning of the engineering course content (Figure 4). Over 60% disagreed that these detracted from learning, and no students felt that it took away from their learning. This was appraised using a single Likert-scale statement. One student noted that the word "detracted" in the prompt "introduces bias." This statement was included to gauge the common instructor concerns about broader activities that detract from engineering course content, and was not designed to evaluate other perspectives.

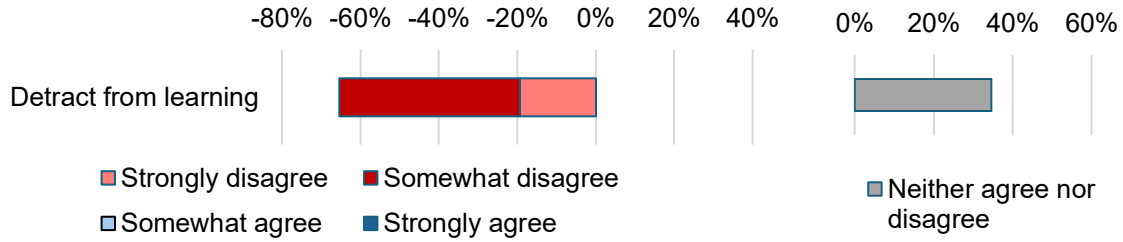


Figure 4. Student opinions as to whether the wellness modules detracted from their learning (26 responses).

Discussion

The project was designed to introduce all engineering students to wellness habits. The modules were integrated into the routine announcements and learning goals at the start of a class period and kept brief (<5 min) to maintain students' attention. From my perspective as an instructor, these modules went well, or at least had a neutral impact. Anecdotally, instructors often worry about whether non-engineering content, such as wellness, will detract from their instructional time and students' learning. Although the survey did not measure students' learning or

performance, their feedback (Figure 4) indicates that the modules did not hinder their learning. Additionally, I devoted only about 25 minutes, or about 1% of the total class time, to the modules, which is less than the time spent on mundane activities such as moving students into groups. There was no impact on the amount of content that was covered relative to prior years.

While the modules aimed to introduce students to wellness topics, the survey showed that students were already familiar with many of them. The majority of students were already aware of box breathing and the positive and negative effects of stress. This familiarity may be due to the growing awareness and candor in mental health discussions in higher education and on social media, or to college students having been taught SEL methods during their secondary education. In the survey, few students were familiar with the PERMA model of wellness, but this is likely because a person does not need a formal psychology framework to adopt its principles. It is important to consider the perspectives of student subgroups; notably, 18% of participants indicated a lack of familiarity with positive and negative stress, and 26% were unfamiliar with box breathing. It is unknown whether these students differ in other ways from those who were very or extremely familiar with these techniques.

Conclusion and Future Work

This pilot project tested the feasibility of incorporating five wellness modules into disciplinary engineering classes. The aim was to support students' wellness in a setting where most students would be present. While all five wellness topics were relevant to a person's well-being, several, such as weekly planning and effective communication, were directly correlated with standard engineering content, including project management and groupwork. However, two of the modules (the PERMA model and stress and box breathing) were rooted in psychology and physiology, with less obvious connections to engineering. A survey of the students found that many had prior familiarity with the wellness topics. Additionally, students viewed these topics, even the explicit wellness topics, as relevant to their success as engineers.

This project has raised several new questions. Despite students' familiarity with wellness topics, mental health remains a crisis within engineering. Further work is needed to understand students' prior exposure to wellness topics and whether they implement evidence-based wellness strategies during stressful parts of the term. I will refine the wellness modules to emphasize the adoption of specific wellness strategies, rather than focusing only on teaching these techniques. The revised modules will also integrate stronger ties to SEL and campus resources such as the Success Coaching program and the campus counseling center. SEL provides a scalable vision to support students' well-being, with instructors creating supportive learning environments that promote well-being, while professional therapists and counselors can provide targeted help to students suffering from psychological distress.

Acknowledgements

Thank you to Yayoi Takamura for introducing the four quadrants of time management framework to this project and for drafting the original instructional slides. Julia Chamberlain and Colleen Bronner were my co-developers for the wellness seminar upon which these modules were built; several topics in this article are adapted from those shared materials. Finally, Virginia Clinton-Lisell guided initial research directions.

References

[1] A. Danowitz and K. Beddoes, “A Snapshot of Mental Health and Wellness of Engineering Students Across the Western United States,” in *2020 IEEE Frontiers in Education Conference (FIE)*, 2020, pp. 1-5.

[2] M. Asghar, A. Minichiello, and S. Ahmed, “Mental health and wellbeing of undergraduate students in engineering: A systematic literature review,” *Journal of Engineering Education,* vol. 113, no. 4, pp. 1046-1075, 2024.

[3] 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.

[4] American Psychological Association, "Well-being," *APA Dictionary of Psychology*, Apr. 19, 2018. Accessed on: September 4, 2025 Available: https://dictionary.apa.org/well-being

[5] Positive Psychology Center. “PERMA Theory of Well-Being and PERMA Workshops.” https://ppc.sas.upenn.edu/learn-more/perma-theory-well-being-and-perma-workshops (retrieved Jan. 14, 2026).

[6] M. E. P. Seligman, *Flourish: A Visionary New Understanding of Happiness and Well-being*. New York, NY: Free Press, 2011.

[7] M. Asghar and A. Minichiello, “Two sides to every psyche: Implications of positive psychology for ‘mental health’ research in engineering education,” *Journal of Engineering Education,* vol. 112, no. 1, pp. 12-17, 2023.

[8] M. V. Huerta, A. R. Carberry, T. Pipe, and A. F. McKenna, “Inner engineering: Evaluating the utility of mindfulness training to cultivate intrapersonal and interpersonal competencies among first-year engineering students,” *Journal of Engineering Education,* vol. 110, no. 3, pp. 636-670, 2021.

[9] S. P. Gentry, J. M. Chamberlain, and C. E. Bronner, “Developing an Online Seminar to Support Students New to Distance Learning,” *Advances in Engineering Education,* vol. 8, no. 4, 2020.

[10] C. J. Wright, S. A. Wilson, J. H. Hammer, L. E. Hargis, M. E. Miller, and E. L. Usher, “Mental health in undergraduate engineering students: Identifying facilitators and barriers to seeking help,” *Journal of Engineering Education,* vol. 112, no. 4, pp. 963-986, 2023.

[11] W. C. Blackburn-Lynch and M. Sleep, “Creation and Implementation of Mental Wellness Initiatives in First-Year Engineering with Faculty Development,” in *ASEE Annual Conference*, Minneapolis, MN, 2022.

[12] N. Johnson-Glauch, L. A. Cooper, and T. S. Harding, “Goal-setting as a Means of Improved Mental Health Outcomes for Materials and Mechanical Engineering Students,” in *ASEE Annual Conference*, Virtual, 2020.

[13] Collaborative for Academic, Social, and Emotional Learning, "CASEL’s SEL Framework," Oct. 1, 2020. Available: https://casel.org/casel-sel-framework-11-2020/

[14] California Department of Education. “California Transformative SEL Competencies.” https://www.cde.ca.gov/ci/se/tselcompetencies.asp (retrieved August 25, 2025).

[15] J. A. Durlak, R. P. Weissberg, A. B. Dymnicki, R. D. Taylor, and K. B. Schellinger, “The Impact of Enhancing Students’ Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions,” *Child Development,* vol. 82, no. 1, pp. 405-432, 2011.

[16] R. D. Taylor, E. Oberle, J. A. Durlak, and R. P. Weissberg, “Promoting Positive Youth Development Through School-Based Social and Emotional Learning Interventions: A Meta-Analysis of Follow-Up Effects,” *Child Development,* vol. 88, no. 4, pp. 1156-1171, 2017.
[17] American Society for Engineering Education. “Papers on Engineering Education Repository (PEER).” https://peer.asee.org/ (retrieved November 6, 2025).
[18] M. F. Ashby, *Materials Selection in Mechanical Design*, 6th ed. Butterworth-Heinemann, 2025.
[19] C. Höfele. Well-Being Theory - Drawn to Leadership [Online]. Available: https://claushoefele.com/d2l/well-being-theory-perma
[20] S. B. Robbins, K. Lauver, H. Le, D. Davis, R. Langley, and A. Carlstrom, “Do Psychosocial and Study Skill Factors Predict College Outcomes? A Meta-Analysis,” *Psychological Bulletin,* vol. 130, no. 2, pp. 261-288, 2004.
[21] R. M. Ryan and E. L. Deci, “Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions,” *Contemporary Educational Psychology,* vol. 25, no. 1, pp. 54-67, 2000.
[22] S. R. Covey, *The 7 habits of highly effective people: powerful lessons in personal change*, 25th anniversary edition. ed. New York, NY: Simon & Schuster, 2013.
[23] E. Douglas. “The Four Comunication Styles.” Leading Resources Incorporated. https://leading-resources.com/communication/the-four-communication-styles/ (retrieved Dec. 30, 2025).
[24] Fig. 1 by University of California, *What stress does to your body (it isn’t always bad)*. (Mar. 24, 2020). Accessed: Nov. 1, 2025. [Online Video]. Available: https://www.youtube.com/watch?v=m0s3039GYxc
[25] American Psychological Association, "Eustress," *APA Dictionary of Psychology*, Apr. 19, 2018. Accessed on: Jan. 5, 2026 Available: https://dictionary.apa.org/eustress
[26] Sunnybrook Hospital, *Box breathing relaxation technique: how to calm feelings of stress or anxiety*. (Oct. 5, 2020). Accessed: Dec. 30, 2025. [Online Video]. Available: https://www.youtube.com/watch?v=tEmt1Znux58

Appendix: Survey on Wellness Topics in Engineering

This survey asks about prior familiarity and the suitability of wellness topics that were taught in this course. These are briefly described below for reference.

- **PERMA model of well-being:** Defines 5 categories of well-being (Positive emotions, Engagement, Relationships, Meaning, and Accomplishment)
- **Motivation on a daily basis:** Identifying daily rewards and structuring the day to help complete tasks
- **Weekly plans:** Creating a weekly plan of when you will accomplish your tasks (e.g., classes, homework, jobs)
- **Task prioritization:** Identifying tasks as urgent/not urgent and important/not important
- **Positive and negative stress**: Recognizing that stress can have positive physiological impacts, in addition to negative impacts when there is too much stress.
- **Box breathing:** A stress management technique where you control your breathing in a pattern (breathe in, hold, breathe out, hold)
- **Effective communication**: How to identify differences in communication styles, and the ways that these may hinder communication

<u>Prior familiarity with topics</u>

Indicate your level of familiarity with the following wellness topics, **PRIOR TO Fall 2025.** *Definitions are listed above.*

	Not familiar at all	Slightly familiar	Moderately familiar	Very familiar	Extremely familiar
PERMA model of well-being	○	○	○	○	○
Motivation on a daily basis	○	○	○	○	○
Weekly plans	○	○	○	○	○
Task prioritization	○	○	○	○	○
Positive and negative stress	○	○	○	○	○
Box breathing	○	○	○	○	○
Effective communication	○	○	○	○	○

Relevance to Engineering

For each topic, indicate whether you agree or disagree with the following statement:

"**Learning about this topic is relevant to my success as an engineer."**

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
PERMA model of well-being	○	○	○	○	○
Motivation on a daily basis	○	○	○	○	○
Weekly plans	○	○	○	○	○
Task prioritization	○	○	○	○	○
Positive and negative stress	○	○	○	○	○
Box breathing	○	○	○	○	○
Effective communication	○	○	○	○	○

Effect on course content

Indicate whether you agree or disagree with the following statement:

"The wellness modules detracted from my learning of the course content."

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

Optional Demographic Information

How do you describe yourself?

____ Woman
____ Man
____ Transgender Woman
____ Transgender Man
____ Non-binary
____ Gender not listed here (please specify)

_____

____ Prefer not to answer

What is your race/ethnicity?
(Check all that apply)

____ American Indian or Alaska Native
____ Asian or Asian American
____ Black or African American
____ Hispanic or Latino/a
____ Middle Eastern or North African
____ Native Hawai'ian or Pacific Islander
____ White or European
____ My race or ethnicity is best described as

_____

____Prefer not to answer