

# **SURVIVING AND THRIVING IN FIRST YEAR - SUPPORTING STUDENT EXPERIENCE**

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## **ABSTRACT**

To support to students' transition into university, the authors developed the Engineering Attributes Program in 2019. The program includes a series of modules, such as The Mental Health Continuum, Exam Anxiety, Procrastination, Time Management, Academic Burnout, Motivation, and Diversity. Each module includes information delivered to first year students and a corresponding reflection grade. The delivery modes implemented over the three years of the program's delivery are summarized in this paper. The authors have reviewed student comments and have grouped them into themes, which are summarized in this paper. The authors will share their insights into the student experience, based on our interactions with students over the years, and our reading of their reflection assignments.

## **KEYWORDS**

Mental Wellbeing, Reflections, First-Year, Standard 8

## **INTRODUCTION**

At universities across Canada, student survey data indicate that students in first-year engineering face common challenges related to their mental wellbeing. Students report feeling overwhelmed by all they have to do (89.2%), feeling overwhelming anxiety (60.3%), feeling things are hopeless (52.6%) and feeling so depressed that it is hard to function (39.0%) [ACHA]. In engineering in particular, the workload in first-year is high and many students struggle in the transition to university life. Student surveys at our institution indicate that our engineering students are no exception to this trend – well over half the students report feeling overwhelmed, lonely, anxious and sad frequently throughout the academic year. While many students acknowledge that mental wellbeing supports are available on campus, small numbers of students choose to access those supports – only 5-10% of our students report having accessed any type of mental wellbeing support on campus.

At the University of Calgary, we implemented a first-year engineering wellness program (called The Engineering Attributes Program) in 2019 to provide students with concrete tools for wellness and learning strategies. The purpose of the program is not to replace professional mental wellbeing supports; rather, it is to normalize conversations around mental wellbeing, increase awareness of campus supports, foster a positive sense of belonging and community, and encourage students to develop a self-reflection practice. The curriculum for this program was developed in collaboration with students, a faculty member from the department of psychology and staff in the University of Calgary's Wellness Centre. The curriculum includes

topics such as The Mental Health Continuum, Exam Anxiety, Procrastination, Time Management, Academic Burnout, Motivation, and Diversity.

The program includes student reflection assignments, which provide very rich data for understanding the student experience. Throughout the three years of running the program, our first-year engineering courses have had very different delivery modalities; starting with a “traditional” lecture delivery in year one (2019/2020), moving to remote learning in year two (2020/2019), and finally a blended delivery with a focus on studio-based in-person active learning (CDIO Standard 8) in year three (2021/2022). This new delivery method is discussed in the author’s companion paper “Implementing Active Learning in First Year Engineering – A Leadership Perspective” from this same conference proceedings.

## **BACKGROUND**

The transition to university from high school is a time of significant change for students, and this can cause the emergence of significant anxiety and depression (Merriam & Baumgartner, 2020). During this time of transition, students can feel overwhelmed, isolated, and that can often lead to attrition of students (Schuh et al., 2010). Often, undergraduate students who feel they are not able to achieve their goals will list procrastination and poor time management as factors which led to their lack of achievement (Lavecchia et al., 2016).

Studies have shown that curriculum and programming which is targeted at improving student self-efficacy and self-esteem leads to increased retention and positive outcomes for students (Nordstrom et al., 2014). There is a direct correlation between GPA outcomes and student mental health and wellness, suggesting that early intervention with mental health programming could support student success for undergraduate students (Krumrei-Mancuso et al., 2013).

In engineering specifically, mental health and wellness research is a growing area of research that is still quite limited (Danowitz & Beddoes, 2020). A study at the University of British Columbia found that over 50% of students in engineering felt overwhelmed, exhausted or sad (Golsteyn & Nino, 2018). Additionally, 10% of students considered suicide within the last 12 months, which is an alarmingly high number of our students (Golsteyn & Nino, 2018). These numbers emphasize the importance of doing mental health and wellness programming to provide students with resources and tools to support them both academically and personally.

In the medical field in Canada, there is a call to create a national framework to support student wellness (Bourcier et al., 2021). It is important to remember when integrating mental wellness programming to not just rely on providing students with information, but to also analyze the system and chance systemic factors (such as too high of a workload) that are contributing to student stress and wellness. In engineering, the University of British Columbia has also implemented integrated programming and their results show the importance of interventions for reducing stress factors such as exam anxiety.

## **ENGINEERING ATTRIBUTES PROGRAM**

The curriculum for this program was developed by the Engineering Attributes (EA) team. The EA team was comprised of academics, graduate and undergraduate students from the

faculties of both engineering and psychology and the Engineering Academic Development Specialist (ADS). The EA team worked to compile the curriculum in consultation with staff in the University of Calgary's Wellness Centre. The curriculum is summarized in Table 1.

Table 1. Engineering Attribute Curriculum 2021/2022

<b>Timing</b>	<b>Topic</b>	<b>Speaker/Facilitator</b>
Wk 3 Fall	Academic Integrity	Associate Dean
Wk 4 Fall	Exam Anxiety	Engineering ADS
Wk 5 Fall	Mental Health Continuum & Wellness Wheel	Psychology Professor
Wk 6 Fall	Teamwork	Psychology Professor
Wk 7 Fall	Impostor Syndrome and Resiliency	Engineering ADS
Wk 8 Fall	Time Management and Procrastination	Undergraduate Student
Wk 9 Fall	Academic Burnout	Undergraduate Student
Wk 11 Fall	Teamwork #2	Psychology Professor
Wk 12 Fall	Diversity and Resilience	Assoc. Dean T&L
Wk 13 Fall	Review	Engineering graduate TA
Wk 2 Winter	Safety Mindset	External
Wk 4 Winter	Biases and Social Wellbeing	Undergraduate Student
Wk 6 Winter	Substance Use	Social Work Professor
Wk 10 Winter	Metacognition, Bloom's & Errorful Learning	Assoc. Dean T&L
Wk 12 Winter	Review and Emotions in Learning	Engineering Graduate TA

Students are expected to submit reflections related to the module for completion grades. As an example, in the "Impostor Syndrome and Resiliency" module, the Academic Development Specialist delivered a presentation defining and describing Impostor Syndrome, and shared practical strategies for cultivating more resilient thinking. The students' reflection assignment, as seen by the students in their online Learning Management System page is shown in Figure 1.

Oct 19 Imposter Syndrome & Resiliency

REFLECTION QUIZ

Quiz

Due Oct 21, 2021 1:00 PM Starts Oct 19, 2021 12:00 PM Ends Nov 2, 2021 5:00 PM

*Disclaimer: The following questions ask about your resiliency, imposter syndrome, and possible cognitive distortions. Please review the material presented in the seminar to support your answers. Do not feel obligated to delve into deep personal stories on these topics if it doesn't feel safe for you right now. Your marks are completion based.*

Reflect on a situation you may have fallen into imposter syndrome, a fixed-mindset, or cognitive distortion narrative.

1. CATCH IT: What thoughts, feelings, and emotions were you experiencing in this situation? Consider and summarize at least 3-4 different feelings and emotions.
2. CHALLENGE IT: What cognitive distortion do you think you may have fallen in to? How could you reframe or rephrase your internal narrative to a positive, growth-mindset oriented thought? Summarize in 2-3 sentences.
3. CHANGE IT: Consider your responses above, what resources or habits do you plan on leaning on to support you in this kind of situation, or when you fall into this kind of thinking? Summarize in 2-3 sentences.

Figure 1. Screen Capture of Reflection Assignment for Impostor Syndrome & Resiliency Module

In the three years of the program implementation, the delivery mode of first year has changed significantly, while the basic content of the Engineering Attributes program has remained largely consistent. Delivery methods are described in below.

### ***First Implementation – Delivered via In-Person Class Visits***

In the first year of the initiative (2019/2020), we delivered the material through conventional in-person lecture where the content was integrated into technical courses for most of the year, albeit the delivery transitioned to remote in March 2020. The course instructors for 5 of the ten first year courses agreed to take part in the program. For each of these 5 courses, instructors scheduled 3 class visits throughout the semester. In these class visits, a member of the Engineering Attributes team delivered a 15-minute module, which included information on a mental wellbeing or learning strategy topic, a short activity, and a personal reflection assignment. In each participating course, 3-5% of the course grade was assigned to Engineering Attributes reflections, which were graded on a completion basis.

### ***Second Implementation – Delivered via Virtual Class Visits***

In second year of the initiative (2020/2021), all the content was delivered remotely, due to the global pandemic restrictions. The course instructors for 4 of the ten first year courses agreed to take part in the program. For each of these 4 courses, instructors scheduled 3 class visits throughout the semester. In these class visits, a member of the Engineering Attributes team delivered a 15-minute module in the zoom-based classroom environment, which included information on a mental wellbeing or learning strategy topic, a short activity, and a personal reflection assignment. In each participating course, 3-5% of the course grade was assigned to Engineering Attributes reflections, which were graded on a completion basis. In this second iteration, a D2L course page was created specifically for the Engineering Attributes program. The modules were recorded and posted for the students to review as they wished.

### ***Third Implementation – Delivered via Weekly Scheduled Seminar Hour***

In the most recent year (2021/2022), the entire schedule of the first-year engineering student experience has been transformed with the transition to blended learning. The first year blended

model is described in another of the author's papers in this conference proceeding. The Engineering Attributes content is now being delivered in weekly 50-minute seminars scheduled specifically for this purpose. The seminars were delivered in person, and live-streamed over zoom. They were recorded and posted for the students to review. Following the seminar, students were assigned personal reflection questions. In each engineering course, 3-5% of the course grade was assigned to Engineering Attributes reflections, which were graded on a completion basis.

## **RESULTS and DISCUSSION**

Across all three implementations, students regularly provided feedback on the Engineering Attributes program, through formal survey questions as well as informally through email feedback and personal conversations. Across the three different implementations, we observed similar themes in the feedback and will summarize those in this section.

There are four main themes that emerged in the feedback, three of which were common each year, and one of which had slight variation depending on the implementation. The three common themes were: *students feel seen*, *students are receiving information*, and *students feel we are helping them succeed*. The fourth theme can be summarized as *students don't have time*, and how this one emerged varied across each year. In the analysis below, representative quotes are only provided for the first and second implementations, as research ethics has not yet been completed for the third implementation.

### ***Students feel seen***

Across all three years, we regularly heard appreciation from students because they felt seen and didn't feel alone due to the content being discussed in the engineering attributes program. Much of this feedback was informal through one-on-one conversations and emails from students sharing their appreciation. There were two main subthemes within this area: being seen by faculty and leadership, and not feeling alone.

#### ***Being seen by faculty: "Just the idea that you guys care"***

It was common for students to come up to us after class and let us know that it's nice to see the faculty and leadership cares about their wellbeing. One student from the second implementation said in their reflections, "Just the idea that you guys care is enough for most of us. We do appreciate it and what you guys do." Students often shared their appreciation with us, and genuine thanks for showing that we care. In the first implementation, a student said, "Everything was very useful thank you for doing what you have done." Much of this sentiment comes because students want faculty and leadership to acknowledge the huge transition that they are going through and how this can be quite difficult. One student phrased it well, "I have found these presentations critical to my transition to university and would love to see more content presented." Simply reminding the students that we understand they are going through some things is helpful in helping them feel like we are treating them as human beings.

In the second and third implementation of the program, students regularly talked about how helpful it is to feel supported by their peers and feel as though others can relate to their experience. In these two implementations we had upper year students coming into the class

to support the Engineering Attribute modules and we believe this made a huge difference. Additionally, in the second year when the program was entirely virtual and synchronous, students were more likely to share relatable feelings in the Zoom chat feature.

Many of the comments go beyond being able to relate to each other, but students often felt they were the only one struggling and it was very comforting to know that others were struggling in the same way and normalizing the feelings. One student said, "Talking to other people and making these things seem normal makes me less afraid when something like this does happen. Because I am not the only one." Another student talked about how they were "feeling bad about [them]self" but during the Engineering Attributes they were able to "talk to the people in the class who were in the same boat as me" and that this "really helped and made [them] feel better." Being able to normalize these feelings is an integral part of the program, one student even said, "I feel that one of the most helpful components that the program offer's is the normalizing of the feelings that most of us are feeling."

In the first year of the program, it was less common to receive this feedback, which emphasizes the importance of the upper year students engaging in the module delivery. Some students even recommended this in the first year, suggesting, "Maybe even included personal stories from students or student-led aspects to make it more personable and less like a formal lecture" or that it would be helpful to learn "from upper year students and getting tips and tricks."

### ***Students are receiving information***

When delivering a program, it can be difficult to know if the information resonates or is useful to students. From the feel on the program, we have found that all modules resonate with at least a portion of the students, and all students resonate with at least a portion of the modules. The goal is not to make every module applicable to everyone, for example, *exam anxiety* is not a topic we expect everyone to need support with. However, the concepts we teach can be applied widely and we have found that mostly everyone comes out with some useful information. We found two subthemes in this area, generally just that the information is useful, and specifically that the information on accessing additional resources and services is beneficial.

#### *The information is useful: "Thank you for all the tips!"*

Students will comment on specific modules that they found most helpful to them. For example, in the first implementation, students said "I found the stuff on wellness very helpful because balance is hard." In the second implementation, students talked about how "the exam anxiety and de-escalation strategies were most helpful," or how they "often use the "square breathing" technique and other grounding exercises we learned to get me through stressful times," or that "the imposter syndrome/resilience seminar was by far the most helpful." These are just a few examples, almost each module is specifically mentioned by one student as being the most impactful. Generally, the curriculum is designed to follow the flow of when students will need the information, which was acknowledged by this student, "I think that the topics are pretty spot on for what a first year engg student is going through so the material is super relevant"

The students also talk about how the information is application to their engineering career. In the first implementation, one student said, "Engineering Attribute Activities teaches us important applicable soft-skills that not only enhance our learning experience and academic

career, but also apply to and will carry to our professional future in the foreseeable future.” Although often the technical is valued about professional attributes in engineering, some students understood the importance: “This is awesome because these skills are equally as important as other things we are learning and will help us to be more well-rounded.” Others appreciate the program because it has helped them to develop this understanding, one student stated the program “provides me with a new realization about the importance of mental health and how that affects others around me.”

#### *Access to resources on campus*

Anecdotally we found that the Engineering Attributes program increased help seeking behavior. For example, the Engineering Academic Specialist whose role it is to support students in their academics, found before the Engineering Attributes program she only received emails asking for help *after* the first midterm. In the year of the first implementation, she had already schedule 10 appointments with students prior to the first midterm. That being said, in the first implementation we didn’t have a structured resource list and often received feedback that this would be helpful. One student suggested, “Engineering Attributes should have more information on D2L a course shell maybe” and another said, “It could be good to have a list or explanation of all the resources in Schulich. As a student, I feel that I don’t know where or when to access the Student Success Center, Academic Advisors, or other resources (I don’t really know if there is any others).” This showed the importance of not just talking about the resources available during the modules, but also having multiple spots where students could find the list of resources.

In the second implementation, at the end of *every* module we included a slide with resources, as well as highlighting the specific ones relevant to the topic that week, and including resources on the D2L course shell. We received feedback from students which said, “I think that this is generally a good way to let people know about the resources available to them if their struggling” and “I also appreciate the knowledge of what resources are available for us,” which shows that this was helpful.

#### ***Students feel we are helping them succeed***

Beyond the engineering attributes program helping students to feel seen, and being useful to students, they truly feel that the program was designed to support them in their learning as best as possible. This emerged in two subthemes – they felt the reflections which followed each module were beneficial to their learning, and they appreciated the “free” grades.

#### *Being forced to reflect each week - “Allows me to take time and think about myself”*

In the first implementation of the program, we wanted to keep the homework to a minimum so we would often encourage students to quickly login and do the reflection quiz during class. This meant the reflections were often only a couple words and were very surface level. In the second implementation, since it was virtual, the reflection quizzes were due 48 hours after the presentation. Additionally, at the end of each question we included “summarize in 2-3 sentences”. Although we knew this small change would lead to deeper reflections, we also expected students to have a stronger dislike of the reflections. Rather the opposite happened where we heard over and over again how much students appreciated the reflection. Here are just a few student quotes from the second implementation exemplifying this:

- “The most helpful part of this program is that it gives the students a chance to slow down and reflect. Sometimes we get busy and everything is moving so fast it is nice to stop for a moment relate with others on how the semester is going.”
- “I mostly write these for myself as its incentive to think about how I think more in depth than I usually do. Also it makes me think critically about how I deal with these problems.”
- “Seminars give me chance to reflect my learning process. It allows me to take time and think about myself and recognize my strengths and weaknesses.”
- “I really enjoy these reflective quizzes. Since they have a due date, it kind of forces me to reflect, which I think is very helpful going forward. It's nice to take a break on school and reflect on how I'm really doing regrading my mental health and my academics.”

#### *Free grades - “the tiny GPA boost in my class”*

Although it might be unusual to highlight students giving feedback that they appreciate the free grades, this exemplifies one of the values of the Engineering Attributes program. We want to provide students with useful information and value without added stress. For example, one student in the second implementation said “I like how we can get marks for our classes by answering these thought-provoking questions, and that the seminars really do help with my mental health, as well as teach me some life skills.” Another student in the first implementation said, “It's nice getting free marks during these seminars, while simultaneously learning studying strategies.” If a couple ‘free’ marks is all we need to get students to listen to mental health strategies and reflect on their academic wellbeing, then we would call this a success.

#### ***Students don't have time***

As with any program, there are always areas for improvement. Students often gave suggestions for improvement, but they often fell within a common underlying theme. Students struggled to have time to fit in self care when they were already feeling overwhelmed by all the other requirements on their time. Because each year the program was implemented slightly differently, this manifested uniquely in each year dependent on the implementation.

#### *Implementation year 1: Bad timing*

In this year, many students talked about how they felt when Engineering Attributes were in their classes they were missing out on other material. This student quote highlights it well: “The presentation during our ENGG 233 lab was not good timing as labs usually take the entire class to complete and everyone was hoping to finish early in order to go and review for our chem midterm later that day, as consequence not many people were truly listening to the talk and it added unnecessary stress to our day.” It is evident that this student prioritizes their ENGG 233 (computing for engineers) lab and their chem midterm above the Engineering Attribute materials. Another student gave a suggestion saying that instead of class or lab time, “seminars work better as it's a chunk of time allocated to that so it doesn't leave students feeling like they're wasting time or anything.” Again, the implication here is that Engineering Attributes are a ‘waste’ of time relative to other technical course material.

#### *Implementation year 2: Stressful deadlines*

Although many students talked about the learning value with the reflective quizzes, they also said that they felt the regular deadlines added stress to their already busy schedules. One



student said that the “reflection quizzes, sessions and projects take more time from studying or taking a break.” The higher value this student places on ‘studying’ relative to learning about Engineering Attributes is evident. Another student said the goal of the program was positive, but “attaching a grade and deadline to these quizzes - as minimal as they may be, might not be the best approach, as they could end up being just another source of stress on top of an already packed workload.” Other students talked about how the deadlines were “cumbersome” or difficult to “keep track of” or feeling “swamped.” Overall, these responses show that students feel their workload is too high and to resolve this, they would change the Engineering Attributes program as they view it as lower value than their other classes.

#### *Implementation year 3: Sessions too long*

In the third implementation, sessions were delivered by consistent weekly scheduled seminar hours. Across the feedback, we regularly saw comments from students who said that the sessions were too long. Again, these comments often include the sentiment that there is other studying the students could be doing with their time. This seems to be consistent with the perception that students value their technical engineering content over the engineering attribute content. In addition, attendance was observed to be lowest in this format of content delivery.

## **CONCLUSIONS / RECOMMENDATIONS**

The Engineering Attributes team has successfully implemented a program for First-Year engineering students to support them in their mental wellbeing and transition to the university environment. In general, the feedback about the program is that it enhances a feeling of support from the students, like the university environment “cares” about them. The students agree that the content delivered in this program is important and helpful to them as they navigate their first year on campus.

Ongoing challenges with the program are that the students still feel like it is difficult to make time for this content. Students acknowledge how important their humanity is, but they tend to prioritize technical content and grades in their courses and therefore find it challenging to prioritize their wellbeing.

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**Robyn Mae Paul** is a PhD Candidate at the University of Calgary, Schulich School of engineering. Her work is looking at the Hidden Curriculum of engineering, aiming to use Agent Based Modelling software to improve engineering classrooms. She was involved in developing and implementing the Engineering Attributes program in first-year engineering, as well as the Integrated Learning Stream program in second-year electrical engineering. Robyn's interest is in reflections, feminism in engineering, and mental wellness.

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