Canadian Engineering Leadership Conference [CELC] - 2020

Report

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In Attendance:

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Overview

Located at the heart of Alberta, Edmonton, held by the University of Alberta. The Canadian Confederation of Engineering Students Canadian Engineering Leadership was an amazing opportunity and an honour to witness and participate in. This conference focused on the idea of leadership in engineering and its impact on multiple levels of society from the student body in a university to the upper level of changing the views of the government and impacting major stakeholder’s perspectives. Simon Fraser University Burnaby location sent 4 student delegates to represent SFU’s Engineering Science Student Society, each delegate would decide on a different stream of events ranging from VPX, Leadership, Theme and Engineering societies. Each stream would provide its own set of topics and ideas to communicate. This conference focused on engineering in industry and how we can affect society by understanding the roles of stakeholders, communication and the general trend in engineering as a profession. The night events offered chances for students across Canada to communicate and understand the culture of different engineering student societies, it also fostered an environment to share ideas and improve on student involvement. This interlaced-style conference provided many concepts from a broad range of industries for young adults soon to professional engineers.
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Jan 3rd

Regional meeting
We had a brief meeting about how different engineering societies form WESST and its relation to CFES. We were encouraged for questions and reminded of our roles to represent the school as a whole. Delegates were told that we have a social room for WESST delegates in the hotel as well for work and social related events.

Opening ceremony
After the first breakfast at the hotel, the opening ceremony set the tone of the entire conference and discussed the following ideas:

- The willingness to adapt to change
- This conference’s mission includes:
  - Leadership
  - Communication
  - Tech development
  - Information sharing
- Problems/solutions/responsibilities for engineers to achieve sustainability:
  - A capitalistic society promotes and contributes to a higher standard of living at the cost of higher emission
  - Raise the question that should everyone live/deserve to have this higher standard of living which isn’t sustainable
  - How should we as engineers convince people to be more environmentally conscious if they were not interested in nature and the environment
  - To put in perspective, from another conference for a group of less than 100, there was an abundance of trash leftover.
  - Reminded to sort our trash in the hotel
  - Ask your school if they have a plan for a more sustainable future. ie: promoting devestment for the school’s financial portfolio
  - A sustainability aspect and how we can improve as ESSS
- Inclusiveness:
  - Engineering:
    - Is not apolitical, we must consider the political consequences our actions will have
    - Should be designed for a wide range of people
    - Be conscious of our biases from design to production
  - Oppression and how it came to be:
    - Oppression’s progression:
      - Starts with stereotype →
• Builds Prejudice →
• Results in discrimination.

○ Discrimination /bias came from a wide range of things
○ Deal with microaggression:
  ■ Recognize
  ■ Reflect
  ■ Act
  ■ examples:

Say this:                      instead of:

● Unread                  ● Insane
● Unbelievable            ● Crazy
● Jerk                    ● Psycho
● Awful                   ● Stupid
● Bad                     ● dumb
● Moody                   ● Bipolar
● Ridiculous              ● Retarded
● Eccentric               ● Mental case
● Dismantled              ● Crippled
● Unruly                  ● Madhouse

○ Beware of the bilingual culture in Canada and speak slower
○ Understand that mistakes happen through the day to day interactions, it is far more important just to be conscious of your own speech

• Race and with ethnicity
Discussed the difference between race, ethnicity. The race is based purely on biology whereas ethnicity is based on a system of beliefs, behaviours, traditions that are formed over a long time through an individual’s experience. It is never advised to assume a person’s race or ethnicity. Also, note that even though there are positive stereotypes, they are still playing into a negative role towards prejudice. It is important to understand the difference between cultural appropriation and cultural exchange. Cultural appropriation contributes towards prejudice whereas cultural exchange is based on the idea to understand ideas from different cultures for the benefit of improving connections between cultures. During the discussion, it is microaggression is compared with a mosquito bite in the sense that even though microaggression isn’t outright discrimination, it does linger and take away from the individual or group used against. In summary, to better understand the world around you and be conscious of your actions, it’s best to do your own research since the topic is always changing. Moreover, understand your own privileges and listen to the concerns around you to be as supportive as you can.

• Consent:
• Intervention:
Team motivation

This presentation by the President of the University of Alberta ESS, Mandy Lim. She shared her knowledge of her experience on how to have the most productive team by using different methods to motivate students. Here are some key points:

- Get someone to want something, instead of telling team members on what they should/can do, it is a better approach to let the members crave for tasks for the return of the results they want to see. ie: create a positive environment for your team, make it personal to each member and let the team invest for themselves so they can see and experience their impact.

- Productive and counterproductive motivation.
  - Positive motivation: rewards for actions.
  - Negative motivation: punishment for the lack of action.
  - Positive motivation will outperform negative motivation in the long run.

- Intrinsic and extrinsic motivation:
  - Personal hobbies (personal satisfaction) are considered Intrinsic motivations.
  - monetary/awards are considered extrinsic motivations.
  - intrinsic motivation will outlast extrinsic motivation when it comes to long term work.

- Pay attention to your members and watch out for:
  - Stress
  - Burnout
  - Lost vision
  - Set back

- Tips on better motivate your team as well as yourself:
  - Set milestone, know how much you have done
  - Keep the end goal in mind
  - Reward yourself after accomplishing a daunting task
  - Go easy on yourself, being negative about set back will only hold yourself back
  - Regular check-in (note that some members thrive when left alone while others prefer to have frequent updates)
  - Update plans accordingly
  - Get help for yourself when needed as well as seek help for your teammates
  - Healthy pressure is important to keep a team productive

- More essential teamwork concepts:
  - Energy/passion plays an important role in a team
○ Communication
○ Understand the end goal and set the groundwork early
○ Tasklist (calendar)
○ Take breaks when needed
○ Teamwork, helping out teammates
○ Tracking goal
○ It's all trial and error

How and when to speak out

John Gamble, President of the association of Consulting Engineering Companies. Gave the delegates an intro to dealing with opposing views in industry and how to deal with them. Mr. Gamble had experience as a lobbyist and spoke on the importance of projecting your view to the individuals that matter in different environments. Mr. Gamble wanted delegates to be informed of the issue first and find the end goal. Such as regulation, policy, program funding, or if one is looking to change implementation or operation. Sometimes, your goal might only be raising awareness. When you’re ready to speak out, you will need to define exactly what you want, identify your audience and stakeholders, this includes groups/individuals who agree or disagree with you. To better promote your cause, you’ll need to have real examples of the benefit of your advocacy and have a well-constructed plan for the future. Once you’re ready to construct your message, remember to tie your message to their narrative and agenda. By showing how you can benefit their interest, companies and stakeholders are more willing/likely to help your cause out. Other ways to build rapport is to speak your audience’s language, for example, use their font, vocabulary, style of writing will bring you closer to your goal.

Listed are 10 ways to be effective:

● Have an advocacy plan
● Tie into government’s agenda
● Give credit early and often
● Get involved with policy development
● Frame advocacy in the public interest
● Hold advocacy events
● Take a multi-partisan approach
● understand and make use of the media - the newspaper is still viable
● seek supportive stakeholders
● build grassroots advocacy- Getting people to think the same

Additional tips to be effective:

● Face to face meeting with politicians, stakeholders will still be more effective than just online presence
● Build long term relationships, you never know what you will need in the future
● Speak to both parts and be transparent about what is discussed
Jan 4th

Keynote: Versatility in your career

Presented by Jocelyn Peltier-Huntley, P.Eng, Lecturer at the University of Saskatchewan. Ms. Peltier-Huntley compared a personal career to a road trip, she told her journey from complying with others to leading the way of her own career. Ms. Peltier-Huntley explained there are many career stages. If you’re in a relationship, the stages of your career can interfere with your relationship goals. It is crucial to understand how a couple can make different career goals work, reflecting back on what their dreams are when they grow up and recognize where they are now. Your kids will make a huge impact not only when they’re born but also when they’re ready to leave, downsizing your home to accompany your need will be another issue. Even with all the obstacles and dilemmas, Ms. Peltier-Huntley still encourages taking future education in your career. Furthermore, Ms. Peltier-Huntley expressed the importance of understanding the external factors in your career. Especially understanding that there is a surface level, implied and in-depth corporation culture. To help yourself, know to get help from your partner, allies, make yourself known to sponsors, mentors, and most importantly, yourself.

Additional Resources:
- couples that work: How dual-career couples thrive in love and work, by Jennifer Petriglieri.
- Jocelyn Peltier-Huntley’s Thesis: harvest.usask.ca
- MiHR
- Me Too Mining

Finance 101

This finance crash course provided insight and experience in keeping engineering societies financially healthy, hosted by Ike Harris-Eze, VP finance for CELC. There are the key points from this session:

- Stakeholders are important, understand who they are
- Risk is just uncertainty
- Have a risk-oriented budget
- Establish a baseline to decipher your budget, look at past budgets and variances
- Spot what changed so far
  - SWOT analysis - a risk analysis
    - Strength
    - Weaknesses
    - Opportunities
    - Threats
- Observe forecast
- Contingency, a backup in case of dramatic failures (5-10%)
- Communication is important in many many factors
- Numbers on paper are just numbers, the story you tell to stakeholders are more important in their decision making
● Bookkeeping is an important aspect of keeping track of spending
● Infographics are a good way to present your study, again, a way to convey your message to shareholders
● some schools use “C U Advertising” to easy the sponsor-finding process easier at the cost of service fees

Panel discussion on Versatility in Engineering
Here are the key takeaways from the Panel

● Important to do something different than everyone else
● Challenge the people above you
● "We have always done it that way, we've never does it that way, if you do it that way, everyone would want to do it that way"-phrases discourages efficient thinking and innovation
● Work is not work if you enjoy it
● Worked on different things every day
● Try different coops
● More EIT and P.Eng are needed in the industry
● Have a support team for yourself as your progress in your career
● Have 2-way communication with people you work with
● International coop through profs and school to school is a good opportunity
● Be open to opportunities when they show up

Leadership-take action
This session was the first in its series to plan an event from scratch. Hosted by Hanna Wood. I was not able to attend the rest of the sessions, see Gabriel Manasala’s report for more information. Most information from this session was to apply to the later sessions in this serie.

How to advocate for your member
Hosted by Wendy Vasquez, this session focused on the plan and action of advocating for your student society and getting to your goal by persuading shareholders. Ms. Vasquez walked the delegates through the entire process and potential outcome from actions. Here are the key points:

● Identify an issue that you would like to tackle on
● Set realistic goals and consider workloads
● Identify the stakeholders
  ○ Who do you need to convince
  ○ Allies?
  ○ Foes
    ■ Why are they against you, understand their perspective
  ○ Analyze the cost for the alliance
● Choose the range of campaigning
  ○ What society are you bringing this up? You might be in multiple organizations so know where it is most effective to bring it up

● Have a plan of action
  ○ Have we asked what we want
  ○ Where to start? What media platform to use?
  ○ How to put pressure without becoming irritating
  ○ Who to communicate with (Allies? Foes? Media?)

● Execute
  ○ Does your plan need any update now?
  ○ Is everything going right?
  ○ What progress is happening?

● At war
  ○ Other pressure
    ■ Strike
    ■ Consider more destructive means

● Different groups had all different ideas for issues
  ○ Mainly student union vs school
  ○ The main focus was getting student via communications
Jan 5th

Engineering and Technological Stewardship: making the world a better place for all

Host: Mark Abbott, Engineering Change Lab
Katharine Armstrong, CFES Student
Arlene Williams, Engineering Change Lab

This session took the delegate through a journey of what engineering means and what it could be in the future based on guidelines to improve on the way engineers construct the society. The session focused on the idea that engineering is the catalyst for change. By definition, Technology is the means by which humans adapt their environment to meet their needs. Here’s a graph on how technologies and engineers are impacted and impact society (taken from presenters’ slides):
An eye-opening comparison was drawn in the session on how students view cars’ impact on society, though there were many aspects suggesting that cars contributed to a positive turn for society, it becomes increasingly difficult to judge once you factor in the negative ways it impacted environments, wars, and economy.

There have been standards for engineers to follow, paradigms to be exact. Though those principles seemingly positive, it is nevertheless full of inconspicuous issues. To shape a better future for all, we must clarify and redefine the old paradigms to a new standard that will systematically change and shape future technology:

Seek purpose direct technological development to maximize positive outcomes for all

Take responsibility consider, anticipate and manage the complex impacts of technology across the entire life cycle

Expand involvement integrate a broad range of non-technical experts and ideas into technological development

Widen approaches explore alternative ways to solve problems

Advance understanding foster dialogue about technology and technological stewardship

Realize diversity ensure technological development contributes to creating equity

Deliberate values consider underlying values and make intentional decisions

Shared action we can only succeed together

Above are the new paradigms in this age. To follow them, we can seek and build intrinsic values in designs that will better a wider range of audiences as well as be sustainable in our approach for the future.

Presenting the workshop

This session was presented to students that wanted to present the presentation above a guideline and suggestions. The info session began with ways to promote your workshop such as going to classes in person to advertise, contacting engineering ethics professors regarding reaching more students. It taught us the importance to keep the university’s academic calendar in mind when planning your workshop so it doesn’t collide with tests and important dates. The presenters advised delegates to always plan extra time for the presenters to get setting up and knowing the room as well as upcoming questions. It was also encouraged for student presenters to change things up a bit to fit their school. If you are also interested in presenting an "Engineering and Technological Stewardship" workshop, reach: Engineering Change Lab
How to be me!

Presented by David K. Hein, P.Eng, it is an eye-opening life story focused on Mr. Hein’s professional career. Having just retired the day before, Mr. Hein was eager to share his experience. Mr. Hein begins by confessing his old history of working at places he didn’t enjoy, which affected him personally as well as his daughter. Once realizing that he was no longer having the same quality of life anymore, Mr. Hein was determined to find work that would inspire him to get out of bed each morning.

Mr. Hein told a story of the importance of thinking outside of the box. By making a connection in the use of photographs in rocket launching to using photographs to analyze road stress, he was able to save a fortune for companies that would otherwise use expensive technology to analyze their rocket status. Mr. Hein also stressed the importance of making connections through volunteering and expanding on your knowledge of the market and society.

Here are some key points from Mr. Hein’s workshop:

- Never stop learning
- Don't just “hear”, listen
- Be open-minded, Innovate, Embrace change
- communicate effectively enter get to know people in your desired field (make friends)
- volunteer (be heard and make a difference)
- If it's worth doing, do it right
- Don't be afraid to push your limits
- Follow your passion

Mr. Hein also listed some challenges for engineers in 2025:

- Technology (Google, internet) reducing original thought
- The pressure to reduce government spending
- Low bitter syndrome (where a business will try to go for the lower cost over the unforeseen quality reduction)
- The perception that engineering is a commodity (Diminished stature of Engineers)
- Like a focus on product quality
- University focuses on the business of Education
- Over focus on technology instead of the basics

Engineering as a profession

Presented by Hugh Donovan P. Eng. This session gave the delegates advice on behaving properly in a professional setting as well as Mr. Donovan’s view on the impact of engineering. Here are some points/information from this session:

- Mr. Donovan benefited from persistency in his professional development by daring to ask the right question whenever the opportunity is presented
- Adjust for a career, if you have the ability to adapt, you will be able to interact with more of the world
● When there’s a work-related issue that you want to bring up while it’s making you emotional, it’s most productive to write it down to collect your thoughts first, instead of being destructive.
● Taken from: A Century of Innovation Twenty Engineering Achievements that Transformed our Lives, National Academy of Engineering:

- Electrification
- Automobile
- Airplane
- Water Supply and Distribution
- Electronics
- Radio and Television
- Agricultural Mechanization
- Computers
- Telephone
- Air conditioning and Refrigeration
- Highways
- Spacecraft
- Internet
- Imaging
- Household Appliances
- Petroleum and Petrochemical Tech
- Laser and Fiber Optics
- Nuclear Technologies
- High-performance materials
- Health Technologies

● History is full of detractors of new ideas, keep in mind all inventions listed below were rejected/criticized upon conception:
  ○ Telephone
  ○ Air Plane
  ○ Everything can be invented has been invented
  ○ Military Planes
  ○ Radio
  ○ Computers

● Engineers Canada has a climate-energy online course for free
● Opportunities in the future for engineering:
  ○ Food and water (lack thereof)
  ○ Health care
  ○ Refugee crisis
  ○ Cybersecurity
  ○ Social media

● Engineers or managers
● Instead of your GPA, here are some common skills managers/HR look for
  ○ Communication
  ○ Interpersonal
  ○ Problem-solving
  ○ Technical
  ○ Motivation
  ○ Industry knowledge
Know-how and why a company does their project before you apply
  ○ Analytical mind
  ○ Attention to detail
  ● Take on new challenges
  ● Never stop learning
  ● Network
    ○ Find individuals that have the same interest as you
  ● Don't be afraid to innovate
  ● Don't let step backs stop you
  ● Get involved

Lollipop moment

Drew Dudley: Everyday leadership

In this session hosted by Hanna Wood, Ms. Wood showed a video on the fundamental aspects of leadership. The take-away from that video are listed below:

  ● A moment that you empowered someone that you might not even know, a moment of leadership
  ● We should not leave "leadership" above us where it distances us from it
  ● understand that leadership doesn’t mean changing the world, it could just be changing someone’s world

During discussion afterwards, students are able to identify an individual in their life that had a great impact on their own lives without knowing, keeping in mind to be grateful to them and thank them when credit is due.

Crisis round table

Even though I was not able to attend the session “Crisis Scenarios” by Robyn Graham. The roundtable session was able to provide me with more context and information that was expressed. The presentation focused on the crisis in an Engineering student society as well as being in a management position and issues we encounter. Crises are often time-sensitive, so taking the necessary actions at the right time will prove to be critical. Keep in mind to assess the impact a crisis will have on the reputation of an organization, some actions must be taken to save a reputation for the future. One of the most overlooked subjects is safety during a crisis, due to the urgency of crises; we must not forget the responsibilities we have over our own as well as our surrounding/environment’s well-being. To overlook safety might result in a worse crisis that will hurt reputation even more so.

Of course, different events/situations call for different recoveries and there is not a perfect solution to every situation. As a general guideline to resolve a crisis, we must first assess the situation, identify your
priorities by asking who are your biggest/impactful stakeholders. Take time to stop and listen to the people around you and remind yourself to evaluate the backup plan that was set up. If there isn’t a backup plan, set one up immediately. Once you have identified your stakeholders, communication with them will be the key to keep the situation afloat, especially in a professional setting. Before enacting on your plans, be sure to draw down details to make a to-do list, this will keep yourself and the people you work with more on track as well as having an itemized list to report to your stakeholders. After you have started the process to recover from a crisis, keep constant monitoring and do not be afraid to reassess the situation as it develops, a static plan does not match for a dynamic environment.

After all, the most important part of experiencing a crisis is to learn and grow from it. individuals and groups often run into crises but seldom do they learn and evolve from it, the ones that do reflect upon issues will prove to be sustainable.
Jan 6th

Being an Engineer: Technological Stewardship and the Intersection of our personal and professional identities

Presented by Mark Abbott and Katharine Armstrong. This presentation focused on the potential of engineering and engineering students. Through exploring personal identities and understanding the pre-existing narrative people hold about engineering in general, we can see where technological stewardship can help us to achieve a higher level of potential than we thought. Technological stewardship is behaviours that ensure technology is used to make the world a better place for all. Ms. Armstrong explained that there are 2 components of personal identity: fixed and variable. Fixed identities such as race, height, appearance; whereas variable identities encompass but not limited to habits, education, career, family. Other than our personal identity, we often have to consider our professional identity as well and how they affect our lives.

Another consideration is the current narrative the public is holding about engineering, for example, drinks a lot, smart, highly paid, prestigious. With that in mind, reflect that upon yourself and see how much of that is an accurate representation of yourself as an engineering student. Furthermore, reflect upon who you will be as an engineer. The idea of Environmental stewardship came about around 1960 and for a while, it was thought that environmental issues aren’t engineering related. Later in 2014, in the city of Flint Michigan had major water issues due to a failed application of corrosion inhibitors and resulted in at least 12 deaths. Many issues that were ignored turned out catastrophic, which would be easily prevented with technological stewardship. Engineers are encouraged to understand/follow the new paradigms listed by Engineering Change Lab (tinyurl.com/sen3koe) to foster a healthier future for engineering.

Environmental stewardship

This session is held by Lisa Brown, Ph.D., PEng, Dr. Brown explored the ideas surrounding engineering corporations with the environment. Dr. Brown pointed out that we currently have a higher concentration of metal in the landfills than mines. With more climate change, we will see a steeper impact on everyday life, insurance will cost more due to more frequent floods. It is not fair to say that there haven't been any actions taken, there are national guidelines set in place, more individuals and groups divesting their assets from banks, and the Fisheries Act has been put into place.

Although there have been many actions taken and policies put in place, it is by no means a reason to sit back and relax. From the recent past, we have seen numerous occasions of neglect or even potential schemes for avoiding environmental responsibilities. For example the 2000 Walkerton outbreak of waterborne Gastroenteritis, due to the Operator ignoring existing issues, resulting in 7 Death and 2000+ sickness. For a more Jarring incident, in December 2015, The Volkswagen Emission Scandal. Whereas Volkswagen purposely produced vehicles to cheat the emission test when running stationary. Although some incidents do not have a clear direct impact, it is nevertheless harmful to the environment. Taking place just west of this conference, Wabamun Lake in Alberta has seen a case of an oil spill in 2015. Not
only was it a huge task to clean up, even 15 years later in 2020, it still impacts the community. A once thriving fishing and gathering site now has a lasting dark scar from oil.

Incidents like above happen on a daily basis around us. It is no longer just an environmental professions’ job to tackle this issue. From a strict carbon tax point, we will need $210 per tonne to reach the Paris Agreement, whereas we are only charging $20 per tonne and $50 per tonne in 2022. To reach $210 per tonne is politically impossible and that is where engineering comes in and utilizes other methods to meet a target. Climate change is deeply embedded in engineering in many ways, the impact from AC leaking to the adaptations engineers will need to learn. Electrica engineers will need to figure out how to support more AC at one time or setting up smaller-scale energy farms such as wind or solar. Hydro will need to consider the effect of reduced snow and the resulting diminishing rivers. Civil engineers will need to combat losing coastlines and the residents or docks.

Engineers have a habit to build monuments to their failures, which is not to critique the profession. The iron ring reminds us of our imperfections and always be humble and keep polishing our craft. Our monuments keep our heads straight and look forward; to expect greater creations in the future. Things to look forward to regarding engineering: Higher carbon tax, carbon captures, electrical vehicles, alternative cement from portland cement. Although there are many innovations to be made, one thing is constant. If anything exciting happens, we’ve done it wrong. Stay on track and don’t blow things up.

Managing commitment

This presentation from the Engineering society stream dived deeper into concepts that were touched upon during the “Team Motivation” session. Ms. Emily Secnik is the President of the Lassonde Engineering Society and her experience in the Engineering society has taught countless lessons for managing commitments.

One of the main issues that Ms. Secnik faced is overcommitment. Ms. Secnik encourages students to ask themselves this list of questions before taking up a commitment:

- How does this make you feel?
- Do you believe you can handle this?
- Does this task bring you joy?
- should you remove some responsibility from any of these commitments/
- Will you still be passing all your classes if you take all of this on?
- Do you have time to take care of yourself?
- Anything else you would like to ask yourself?

By answering the questions above, you will be better equipped to prioritize efficiently. Another way to manage your commitment is to make a list of tasks to do. Many failed to realize the amount of work they need to accomplish and therefore feel defeated when an old task resurfaces. By making a list with deadlines, you can also implement internal deadlines; a deadline that you set for yourself so you can stay focused and not stressed for an external deadline(actual deadline). Other than committing yourself to everyone and everything, know that you can still say no after saying yes to a task, but be sure to have that communication early on and tell the person that would be otherwise responsible in person directly so the expectation is set in a mutual agreement. On top of that, a healthy communication will help you to
clarify what you’re asked to do so you know exactly what is expected of you. Ms. Secnik encourages us to not be afraid to say no at times to be more efficient and effective in the long run.

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**Involvement roundtable**

During this roundtable, delegates talked about ways they have implemented to have better involvement in their engineering society. I encourage all student societies to take a look and consider the following:

- A mock passport, you get a stamp for each event you participate in and the reward varies from discount to merch.
  - Loopy Loyalty Stamper is a good digital loyalty program for android and IOS
- Free food is a common way to get participation
  - Secondary tip, bring out the pizza towards the end of an event to make sure people don’t just leave
- Bring high energy to events
- Diversity will encourage involvement as well
- Class talk, don’t be afraid to announce your event in a classroom, get endorsed by profs as well
- Find students on their way to class, you’ll get a higher volume/concentration of engineering students
- Administer town hall meetings to better tailor your events to the individuals you want to reach
**Lean 6 Sigma**

This session was held by Nicolas Hudon. Mr. Hudon gave us an introduction to the idea of Lean 6 Sigma. Simply put, “Lean” represents optimizing resources, “6 Sigma” represents the quality control over 6 standard deviations, resulting in 99.99966% products to be expected to be free of defects. This high consistency is equal to 3.4 defect / million products.

The implementation of Lean 6 Sigma will increase revenue, the underlying philosophy is to do more with less. Lean 6 Sigma focuses on eliminating 8 wastes during production listed below:

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**8 Wastes**

The 8 Wastes are eight types of process activities that get in the way of providing value to the customer.

- **Defects**: Efforts caused by rework, scrap, and incorrect information.
- **Overproduction**: Production that is more than needed or before it is needed.
- **Waiting**: Wasted time waiting for the next step in a process.
- **Non-Utilized Talent**: Underutilizing people's talents, skills, and knowledge.
- **Transportation**: Unnecessary movements of products & materials.
- **Inventory**: Excess products and materials not being processed.
- **Motion**: Unnecessary movements by people (e.g., walking).
- **Extra-Processing**: More work or higher quality than is required by the customer.

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Lean 6 Sigma (continued)

The effect of Lean 6 Sigma, is to develop effective people for the industry. A way to systematically solve an issue is DMAIC: a data-driven improvement cycle. Below is a graph detailing the definition and operation of DMAIC:

**Lean Six Sigma**

**DMAIC**

<table>
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<tr>
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<th>M</th>
<th>A</th>
<th>I</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define</td>
<td>Measure</td>
<td>Analyze</td>
<td>Improve</td>
<td>Control</td>
</tr>
<tr>
<td>Define the problem.</td>
<td>Quantify the problem.</td>
<td>Identify the cause of the problem.</td>
<td>Implement and verify the solution.</td>
<td>Maintain the solution.</td>
</tr>
</tbody>
</table>

Lastly, Mr. Hudon encourages delegates to learn about Eco Lean Sigma, as environmental issues will gain importance in the future. As we progress into our professional roles, keep in mind that leadership plays an important part just like being a supporter. It will pay off to stand for the environment and quality.
Jan 7th

Combating student apathy

Many student societies might face student apathy towards them. Often students themselves feel a lack of connection and opportunity as well. Issues like this often stem deeper than just a “low turn up rate”. Over the course of this presentation, Ms. Akanksha Bhatnagar will walk through from identifying to solving the disconnection students feel with their student society. Furthermore, this knowledge will help individuals/leaders when they are in the industry or in a professional role.

- Types of apathy
  - Behavioural activation
    - Hard to change
    - Behaves like habits
  - Social motivation
    - Encouraged to maintain a social environment
    - E.g. I start conversations without being prompted
  - Emotional sensitivity
    - Related to social motivation but is based on moral and emotions
    - Entirely personal but can be altered over time

- Apathy looks like (symptoms):
  - Decline in
    - Voter
    - Event turn out
    - Survey result
    - Social media engagement
  - Increase in
    - Report of loneliness
    - A report in higher use of mental illness services
    - Vocal minority criticism

- Tips
  - Pick your battles, you can not win them all when you don’t have soldiers
  - Maintain 3 points of contact
    - In-person
      - One on one, face to face
      - Opening up to a group of students during lectures
    - Online
      - Social media, email
    - Physical
      - Posters, events, flags
  - Rid of assumptions, your idea of participation might not align with the majority
  - Know your students, get to know the ones that lack voices and bring them in
  - Create habits, the hardest to do, let the students build a culture of showing up to events
o Keep it fresh, always tweak your ideas to attract your students
o Cohesive branding, pay attention to internal affairs
o Taylor to the audience that “doesn’t care”, you never know what they’re missing and once you have them on board you can then bring more people in
o Streamline methods, have a systematic approach
o Do not celebrate mediocrity
o Rotate themes, you can have the same theme for frosh 5 years later once everyone graduated
o Diversify your events
o Take small steps to achieve bigger goals

Tradition and Engineering Culture

Engineering traditions are more than just studying or drinking, and our speaker Mr. Josh Gozelwitz made a point at this opportunity to let delegates from all different universities share and exchange their idea of engineering culture. We discussed the difference between culture and tradition, tradition is old and often static but culture evolves. Keep in mind that a culture is building a unique community and could be exclusive, something that new engineering societies will need to focus on when starting their own student societies. Many existing engineering student societies need to combat existing cultures that are exclusive and toxic. For example, an unnamed Canadian University had a “less than favourable” event years ago that went out of hand. As a result of that, their school had since banned communication between their engineering student unit and first-year students in the first half of their education. By cutting off students from the initial contact with their student society, the Engineering student society suffers from future participation. Bad practice of engineering tradition stems from an unhealthy culture that will damage the reputation and connection that students have with their faculty and the public.

To build a healthy Engineering culture and a set of traditions, we must start with the elected student leader. The public’s and faculty’s impression of their students stems from the impression they get from the respective student leader. For the previously mentioned university, they are still suffering from a lack of connection to their students years since the incident. However, the engineering student leaders are not letting it down easy, they are representing their students in a better light in the hope to have connections with new students to form a stronger/healthier student society.

Here are some ways to promote Culture and tradition within an Engineering student society:

- Flag, a physical symbol that brought the University of Alberta Engineering society from the ground up
- Trips for student leaders, this will bond the leaders better to perform better as a team in the academic year
- Talked to stakeholders and the organizations to revamp traditions or sharing ideas on new traditions
- Hype up the first years. You can only sustain a healthy amount of involvement once you have consistent participant
Risk Assessment & Planning

Anyone planning for a simple event or a large scale conference will always face unforeseen risks. Universities and organizations alike have guidelines and procedures to mitigate risks such as risk assessment and planning accordingly. Through this session, Mr. Jared Larsen will share his experience as vice-president in UofA and what to look for when assessing risks for events. Mr. Larsen broke down the types of risks present into two categories; Internal and external risks. External risk is reputation and social standing. The organization will risk suffering and internal risk is everything else. Below is a breakdown of what types of risks are acceptable, tolerable and absolutely unacceptable:

<table>
<thead>
<tr>
<th>Risk Likelihood</th>
<th>Risk Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Catastrophic</td>
</tr>
<tr>
<td>Frequent 5</td>
<td>Unacceptable</td>
</tr>
<tr>
<td>Occasional 4</td>
<td>Unacceptable</td>
</tr>
<tr>
<td>Remote 3</td>
<td>Unacceptable</td>
</tr>
<tr>
<td>Improbable 2</td>
<td>Tolerable</td>
</tr>
<tr>
<td>Extremely Improbable 1</td>
<td>Tolerable</td>
</tr>
</tbody>
</table>

Ways to mitigate risks are: avoid, transfer, accept, limit.

- **Avoid**
  - Example: tape down power cords that would otherwise be a tripping hazard
  - Requires the most amount of planning and experience

- **Transfer**
  - Instead of banking on luck, there are ways to transfer your risk to another entity
  - Insurance, so even if you run into trouble, you can turn towards your insurance company

- **Accept**
  - Pick your battles, see the above chart to see what types of risks are better than other ones
○ Limit
  ■ Even when you can not avoid a problem entirely, you can still limit their occurrences or severity
  ■ Example: providing sanitary tools for an unavoidable event during a pandemic

Other smaller things and tips to keep in mind are the presence of first-aid, right to serve, food-safe personnel on hand during events that might potentially require them. If you’re afraid of low turn-out, not only should you have a registration list, consider a small sign up fee. Sign up fees are another way to ensure that your turn-out rate is not dramatically lower than expected.
Final notes

After a taxing 6 days conference, all of the delegates are out of energy but full of newfound information for themselves. Taking a deeper dive into the entire experience, I left with more questions than answers. Questions that will ultimately help me find direction personally and professionally. In the process of finding answers to those questions, I will learn more about myself and the world around me. Main takeaways from this conference are the fact that professionals have to consider their stakeholders and communication is important in the industry. Many will try to build a glorious future, but the ones that take chances and successfully implement meaningful communication will thrive in engineering. This conference also got me to see what other engineering student societies have succeeded or struggled against. Helping us to see what SFU Engineering Science Student Society is exceeding and where we can improve upon.

The organizer team for this Conference paid a lot of attention to details for this conference and everything, I am thoroughly impressed with the University of Alberta Engineering Society to dedicate their energy and time to plan out the sessions, invite speakers, and host engaging night events. Thank you to the engineering students at U of A for hosting this amazing opportunity for members in CFES.

Lastly, I would like to this opportunity to thank the SFU Engineering Science Student Society for sending me as a delegate to this conference. It gave me valuable first-hand experiences as a student, without the support of my fellow engineering students, I would not have the privilege to be the delegate to bring back this report to our student society. I encourage whoever stumble upon this report will take a chance to be involved in the engineering student society. You will find more resources than you can ever expect. There are as many things to be learned by connection with others in the industry as you can learn in school, if not more.