ONWiE Summit 2019

November 21-22, 2019
Liuna Station, Hamilton, ON
#ONWiESummit2019

Sponsored by:

Special Thanks to:

Ontario Network of Women in Engineering
1280 Main St W | Hamilton, ON | L8S 4L7
www.onwie.ca | kjones@mcmaster.ca
905.525.9140 x 24906

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Summit Overview

On November 21-22, 2019, over 200 representatives from universities and industry came together for the 3rd Ontario Network of Engineering for Women (ONWiE) Summit, an action-oriented two days of discussion, planning, brainstorming and sharing of inspiration and ideas for promoting more diversity and inclusion in STEM fields.

On Thursday November 21st, Dr. Marie Klawe, a pioneer who has achieved gender equity in computer science at Harvey Mudd College, shared her insights with more than 200 guests that attended the Keynote Dinner. Dr. Klawe discussed ways to increase the number of women in technology, with practical solutions for industry partners.

On Friday November 22nd, the goals and direction of ONWiE were reaffirmed, while over 100 attendees learned about innovative outreach and recruitment strategies to continue working towards gender equality in Engineering.

The Summit was held at Liuna Station, Hamilton, ON, and hosted by ONWiE and McMaster Engineering Faculty. It was facilitated by Dr. Kim Jones, the ONWiE Chair and Associate Professor, Chemical Engineering Department at McMaster University. SUEZ was the Title Sponsor of this Summit.

The Summit consisted of 1 Keynote Speaker, 3 Workshops, 2 Presentations, 3 Panel Discussions, Roundtable Brainstorming Activities, and an overview presentation of Go ENG Girl 2019. The agenda was designed to maximize learning, networking and knowledge-sharing opportunity for ONWiE Summit attendees. An online survey was distributed after the summit to gather their feedback.

1. Relate workshop topics to values that are important to girls (e.g. UN Sustainable Development Goals https://sustainabledevelopment.un.org/?menu=1300 and https://hellocafe.co.nz/)
2. Partner with others to present off-campus opportunities (e.g. libraries, community centres, places of worship, boys and girls clubs, Big Sisters, alumnae in remote communities)
3. Use ONWiE workshops to introduce girls to other opportunities (e.g. formalise ongoing mentor relationships, highlight camps, include Canadian opportunities here https://theconnectory.org/)
4. Provide subsidies or supports for rural / disadvantaged girls (and their parents?) to travel to Go ENG Girl workshops; provide them extra mentorship training so they can bring activities back to their own school (and become engineering leaders / role models themselves); engage with teachers for nominations

Compilation of Brainstorming Activities

The use of brainstorming prompts, graduate engineering students as note takers, post-it notes, and seating individuals in small groups of eight from different universities and sectors allowed us to collect comprehensive and diverse input and engage as many participants as possible. The prompts were posed, with participants encouraged to record their thoughts individually on post-it notes, then discuss with the group. A facilitator was also assigned to each group to facilitate discussions and report on the summaries of brainstorming activities.

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Overview of Go ENG Girl 2019

Bani Rafeh graduated from McMaster University, with a Master's degree in Gender Studies and Feminist Research. Passionate about gender equity, social justice initiatives, and women's empowerment, the Ontario Network of Women in Engineering (ONWiE) was a natural fit for Bani. Currently, she is coordinating the ONWiE programs for girls. She is an active volunteer in the community, committed to projects welcoming newcomers, empowering minorities, and celebrating diversity.

Go ENG Girl Review

- 24 schools across Canada
- 1900 swag items
- Over 1500 girls registered for the Go ENG Girl events in different locations
- One time support from Engineers Canada for satellite location in Sarnia ($1,200.00)
- "See It Be It STEM It" calendars distributed to all Go ENG Girl locations ($2,000.00 in kind)
- TD Bank Group Sponsorship ($10,000.00 + swag)

Students' Feedback

- More time for activities
- Different activities to showcase streams of Engineering
- Having separate activities for parents and daughters

Parents' Feedback

- More time for activities
- Emphasizing the importance of Gender Equality in Engineering
- More activities related to Climate Change and Environmental Engineering
- More promotion and publicity
- Small group discussions
- Short informative videos instead of power point presentations
- Inviting the alumni

Local Coordinators' Successes

- Fun and hands-on activities
- Engaging both students and parents
- Interactive panels or Q/A sessions
- Securing local funding

Local Coordinators' Challenges

- No shows
- Late cancelations
- Not user-friendly registration system
- Parents willingness to register younger students (grades 5-6)
- Forgetting to sign and bring the Parental Permission Forms

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Workshop: Best Practices

Mary Wells is an award-winning engineer, professor and administrator who has spent more than 20 years in academia. She is currently the Dean at the University of Guelph's College of Engineering and Physical Sciences. Prior to this, Mary was the Associate Dean of Outreach and a professor in mechanical and mechatronics engineering at the University of Waterloo. She also chaired the Ontario Network of Women in Engineering (ONWiE) from 2013-2018. Mary's outreach activities have earned her both the Natural Sciences and Engineering Research Council of Canada Award for Science Promotion, and the prestigious Support of Women in the Engineering Profession Award from Engineers Canada.

How do you (and could you) expand your reach to

- Geographically remote areas?
  - Offering mobile classrooms
  - Offering STEM tours and workshops in local spaces like libraries
  - Offering scholarships and bursaries
  - Teleconferences, Live streaming panels, and video calls
  - Strengthening connections with Northern areas communities and continuing the relationships
  - Finding local ambassadors

- Under-represented women (marginalized, less privileged)?
  - Women Shelters and non-for-profit organisations
  - Partnering with community service providers
  - More inclusive practices for admissions

- First generation students?
  - Raising awareness within parents and reaching out to them via community hubs and libraries
  - Mentorship programs with older first generation students
  - Running workshops in immigrant community centres or places of worship
  - Working with Elders in indigenous populations
  - Volunteers and teachers help students with transportation to events and workshops
  - Coordinating field trips
  - Inviting role models from the same ethnicity, race, gender, culture or particular group

- Economically disadvantaged students
  - Boys & Girls clubs, gathering areas, after school programs, programs to subsidized housing
  - Subsidized spaces in camps and programs
  - Offering summer bridging programs
  - Finding local student ambassadors
  - Provide a bursary to reimburse the students for the travel costs to events
  - Collaborating with school boards to identify students and reach out to them

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Key Ideas:

- Partnership with community service providers
- Building long-lasting relationships
- Rebranding Engineering from a marketing and communications perspective (e.g. using the UN Sustainable Goals)
- Focus on compassion and helping to raise the communities that students are in
- Reaching out to alumni in remote, under-represented and under-privileged communities
- Effective communication
- Inspiring stories that students can connect to
- Using teacher contacts
- Separate presentation highlighting gender stereotypes and barriers for girls to get into STEM (engineering and comp sci specific)

How do you (and could you) prevent no-shows?

- Implementing a small deposit or payment that attendees can get back when they attend
- Checking the events that are happening the same date and time in the community; Making sure there is no conflict with similar events
- Pumping up the event before-hand via Social Media
- Monitor the registration system and send an ambassador to go to the schools with lower registration numbers
- Sending reminders and follow-up emails
- Highlighting the benefits of attending
- Easy cancel options e.g. Reply to this email with CANCEL

What method do you use to engage parents?

- Open House for parents after the events
- Sharing resources and services with parents
- Engage teachers through Science Teacher or Math Teacher Associations

Where do you find the best workshop topics?

- Make workshops related to a world event
- Talk about the mission and the purpose before the workshop; Get students engaged before the workshop

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Current Research & Idea Compilation

Kim Jones is an Associate Professor of Chemical Engineering at McMaster University. She is also the Chair of the Ontario Network of Women in Engineering (ONWiE), an organisation that coordinates the efforts of Ontario universities to recruit a more diverse engineering student population. She has been named the 2019 Engineer of the Year for the Hamilton/Halton region. Kim is a strong advocate for inclusiveness, equity and diversity in engineering. In addition to facilitating outreach programs that reach thousands of girls annually, she does research on effective interventions to create inclusive environments for all engineers.

- Engendering Success in STEM
  - Linking Engineering with community values
  - Emphasizing that everyone belongs in STEM and can success
  - Reminding students of women's historical contributions and professional successes
  - Revising job postings to explicitly welcoming particular or under-represented groups
  - Asking first-year students about their background, how their decision to attend university affected their lives, what lived experiences they had that prepared them to excel in unexpected ways, etc.
  - Encouraging students to attend diversity panels: resulted in positive behaviour change and higher GPA after attending diversity panels
  - Holding panels for parents, asking what they need to be able to support more their children, what supports they have found useful
  - Near-peer identity based mentoring
  - Providing a safe space for students where they can fit in
- Barriers that Women Face in STEM Related Careers
  - Lack of awareness about social aspects of engineering practice
  - Not acquiring necessary communication skills to be prepared for internship or professional work during undergrad
  - Uncertainty of Fit:
    - Self Concept Fit: Is this a domain that fits who I am?
    - Goal Fit: Does this role afford my goal?
    - Social Fit: Do people respect me?
- Leadership and Choice Are Gendered
  - Leading women and men is different with being more autocratic towards men rather than women
  - Less autocratic style may result in lack of direction and consequently confusion
  - Key Idea: creating a pool of leadership

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	• Allyship:
	  ○ It can reduce sense of social identity threat
	  ○ Amplification
	  ○ Inclusion and Sensitivity Training is helpful in workplaces
	  ○ Biased actions and words disproportionately affect minority groups
	  ○ Proactive allyship is easier and more effective for men compared to reactive
	  ○ Examples: consulting women for their expertise, validating women's professionalism, providing work-related resources to women
	Action Items:
	• Panels during welcome week for under-represented students
	• Market to highlight breadth of opportunities and fit with communal values
	• SWE Conference: networking opportunities for faculty
	• Initiate conversations about inclusion with sharing a piece of research, inviting to brainstorm about a topic
	• Promoting positive interactions between male and female students, reducing social identity threat

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Workshop: Strategic Planning

Valerie Davidson has been an exceptional citizen within the engineering community and a dedicated champion of diversity in the profession for more than three decades. The first PhD graduate of the University of Toronto's Canadian Food Engineering Research Program, she went on to serve as a professor at the University of Guelph's School of Engineering from 1988 to 2012. A passionate advocate for creating a more inclusive profession, Dr. Davidson served as the Natural Sciences and Engineering Research Council (NSERC) Ontario region Chair for Women in Science and Engineering from 2003 to 2011. Under her leadership, the Ontario Network of Women in Engineering (ONWiE) was launched, connecting all 16 engineering schools and faculties across Ontario.

How can we ensure intersectionality in our approaches?

- Put a wide variety of women (students and professionals) at the front of the classroom as facilitators and mentors, make sure that the girls attending the event can see themselves
- Running programs on campus presents a barrier to low-income students – instead choosing venues that are in the community (on a main bus route, make it easier for people to be present)
- Bursaries that go beyond just camp fees (food, travel to the program)
- In the organizing committee have people from diverse backgrounds
- Making sure the venue is accessible to all abilities
- Designing activities that can be done on a large spectrum
- Offer co-ed events in parallel
- University of Waterloo: as the students get older more girls are opting into STEM camps

How can we engage men/boys as allies who accept that women/girls belong in STEM fields and who take pro-active steps to create positive environments for education and work?

- Older men are used to working with men but younger men have worked with women
- Create a culture of respect
- Using exclusion scenarios in trainings
- Providing benefits of having a diverse team in Engineering projects
- Discussing consequences of having a homogenous team
- Diversity for the sake of quality, rather than lip service
- Co-ed programs where girls and women feel welcomed and safe
- Allyship beyond binary terms (men-women)
- Pipeline perspective staring at home with parents and school with teachers
- Career mentorship programs, having both men and women as mentors

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	• Feedback from women to create questions and scenarios for trainings • Encouraging more men to attend conferences and make it their priority • Dis-inclusion (when you see in a group the minorities are not engaged), directing questions to the minorities to encourage them to participate • Female instructors in first year as a norm for when students come into university it's normal to see women in leadership roles • Workshops to teach men what they can do as allies

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Conversation about New Approaches to Gender Parity

Cheryl Jensen joined Algonquin College in 2014 as the 8th College President, bringing with her more than 30 years of experience in the college system. Cheryl joined Algonquin from Mohawk College, where she held the position of Vice President, Academic, from 2009-2014.

- Challenge audience to start taking leadership positions to show that it is possible
- Explicitly seek people with diverse backgrounds in order to make better, more inclusive decisions
- We Saved You a Seat pilot program
- 30% of seats in a particular program reserved for women
- Set up working groups to get mentors for women as they went through the program (within the school and professionals)
- Donors started to give money to the program as they saw it was an important cause, asking what the program needs
- Constant reinforcement that women are welcome
- Social Media support as an innovative approach
- Mentorship and leadership helps with imposter syndrome
- Civic Action

Strengthening Partnerships

- Build a Dream— work together to link companies to female undergraduate engineering students
  - o Already interested in increasing their diversity
  - o Barriers: time and space
- Engineers of Tomorrow— share/adapt their mentor training materials
  - o Ongoing relationships with teachers
  - o Training people who interact with students
  - o Training materials to be shared with ONWiE
- Engineers Canada— link with 30x30 K-12 working group

Build Networks

- Facilitate networking between Canadian Women in Engineering groups so that they can share information and best practices, and collaborate on events

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	• Thinking about how our programs are as an appetizer in a menu of WISE activities • Create resources where we help link female students to opportunities within and outside universities • Challenge: Reaching remote communities can be expensive for universities Create programming • Create academic-focused white papers ○ Male academics are often unaware about the barriers that their female colleagues face; These papers are specific to academic • Providing activities that intentionally link with UN Sustainability Goals and community goals to have resources for all institutions (so that they don't have to do it on their own) • Consider teacher supports that help connect content to values (amalgamate and share) • Explore high school physics alternatives; What might be out there and whether they are feasible

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Workshop: Changing Cultures

Maria Klawe began her tenure as Harvey Mudd College's fifth president in 2006. President Klawe is the first woman to lead the College since its founding in 1955. Prior to joining HMC, she served as Dean of engineering and professor of computer science at Princeton University. Dr. Klawe is the recipient of the 2014 Women of Vision ABIE Award for Leadership and was ranked 17 on Fortune's 2014 list of the World's 50 Greatest Leaders. In 2015 she was honored with the Lifetime Achievement Award from the Canadian Association of Computer Science and the Achievement Award from the American Association of University Women, and she was inducted into the US News STEM Solutions Leadership Hall of Fame. She received the Computing Research Association's 2016 Distinguished Service Award.

How do we change leadership / faculty culture to embrace diversity and inclusion goals (and resource allocation)?

- Create networking opportunities for women working/studying in STEM fields
- Enforcing 50/50 men and women in leadership positions
- Emphasis on "missing out on talent" rather than "we have to get to 50% female" is effective in getting support
- One-on-one discussions and personal interactions
- Collaborating on Community Projects and establishing Organic Partnerships
- Empowering the individuals themselves and reassuring them of their value (not a diversity hire, but for what skills they bring)
- EDI and Sensitivity training across the board, across industry and academia
- Changing perceptions of different engineering fields
- Opt-out model for promotions
- Spousal hiring – mandatory (needs to be meaningful work, cannot just be a make work project) – including jobs outside the university, making sure you help the spouses find a position
- Women are facing burnout because they are often the ones leading the diversity and inclusion initiatives
- Engaging industry and creating accountability mechanisms to ensure that they are actually being addressed
- Have more females in academic and leadership roles
- Challenge: get them in the pipeline and make teaching more attractive
- Remove stigmas around taking maternity leave
- Reduce micro-aggressions (around women's choices) and encourage a non-judgmental culture with flexible arrangements for childcare
- Make it possible for career and family goals align
- Pitching academia as a field that has more flexibility around parent/home-life
- Providing more resources to female faculty
- Sensitivity Training for everyone

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1. How do we build an inclusive and diverse undergraduate population?
2. How can we change our curriculum to appeal to a wider range of students?
3. What events are effective?
4. Are there different approaches we should consider in doing outreach?

- Engaging K-12 teachers to inspire kids to pursue STEM. Challenges: lack of funding and political climate.
- Having a section in the syllabus from year 1-4, mandatory training in first year
- Emphasis on Communication skills and framing it as professional skill set
- Inviting outside speakers who connect Diversity and Inclusion to professional engineering success
- Encourage a sense of belonging:
  - Print t-shirts that say "This is what an engineer looks like"
  - Survey students and ask where they're from, what they like about engineering, etc. and create posters that reflect the backgrounds of engineering students
  - Identify opposite scenarios— what might make someone feel like they don't belong?
  - Challenge: there might not be a one-size-fits-all approach
- Pulling in stories from staff and students to provide real-world discussions about what's happening in institutions (not just outside)
- Amplifying positive ally examples
- Challenge: getting buy-in and creating a safe space for these discussions
- Faculty forum where new topics are discussed including diversity
- Have messaging from the dean about the importance of diversity and faculty alliance
- Male allyship group responsible to ensure that women's voices are being heard, promoting diversity
  - Challenges: personal biases, cultural and language backgrounds, resources (time and money), feedback of academic freedom

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- Undergraduate experiences upon coming to university (TAs and GAs who lead their labs) and change the way that TAs and GAs are trained and engage with students
- Trying to change the way that training is framed; Framing as leading teams (rather than teaching) and work on leadership skills and how interact with people in front of them
- Utilizing lab managers and engaging them in the leadership of students, students can come to them with resources
    - Challenge: culture change, but once you have TAs and GAs who value talking to undergrads, they will have a better experience

Maria's Suggestions:
✓ Change often starts with something small— persistence and getting help are likely the two most important things that help to create change
✓ It's so important to learn how to ask for help
✓ Normalizes the reality that everyone needs help
✓ Goals to generate ideas that improve culture for women and girls in learning and work environments; develop and share strategies for achieving culture change
✓ Culture change is hard— "Culture eats strategy for lunch every day"
✓ Even though its challenging, culture change does happen
    - Anyone can be a catalyst
    - Having support from leaders can really help

Some Helpful Strategies:
- If you want to get leaders on your side, figure out what your organizations values are. What their mission and Vision statements are. Frame whatever you want to change in the context of those values.
- Positive Negative Positive (PNP) sandwich: It's hardest to create change in the most successful organizations. Everyone wants to preserve what makes the organization successful (and is it not clear most of the time). "We might be able to make this positive thing even more positive if we just make this slight adjustment."
- First wave versus second wave— the first wave takes so much resistance, whereas the second wave, with time or different framing, might bring about change in a different way.

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	○ Bring in someone from the outside who is a compelling speaker— it can be very hard to hear people within an organization (different dynamics).

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Panel: Innovative Approaches to Gender Parity

Jane Goodyer joined Lassonde from Massey University in New Zealand. As Dean, Jane Goodyer provides leadership in the overall direction of the School. Jane is an advocate of the advancement of women in engineering. While in New Zealand she launched a national engineering outreach program for girls aged 10-14 to encourage girls to consider a career in engineering.

Cassandra Polyzou is the Manager of Diversity, Equity, and Inclusion at Engineers Canada where she leads work on increasing the number of women in engineering, as well as improving Indigenous People's access to the engineering profession in Canada. Her training and volunteer work in LGBTQ+ advocacy, environmental campaigns, and anti-oppression have continued to motivate and educate her ongoing work in diversity and inclusion.

Qiao Sun is Senior Associate Dean (Diversity and Equity) at the University of Calgary's Schulich School of Engineering. In her role of associate dean, she leads the Schulich School of Engineering's initiatives to advance diversity in engineering.

Jane—Rebranding engineering for women; choose your favourite campaign:

- Ask yourself why you're doing any particular thing? What drives you? How do you want to measure it?
- Trying to change the narrative: Involve everyone. Being proactive in getting women leaders
- Guidance councillors are not adequately educated or informed. They mostly divert girls away from engineering

Cassandra— Creating grassroots and getting support from other groups

- EDI approach is not a centralized one, but works across space and helps change happen within industry
- Communicating and being transparent about the changes that are happening
- Working across and within sectors, being comfortable sharing both successes and challenge
- Working towards the same goal together for changing the image of engineering

Qiao—Opening access to engineering programs to students who have not taken physics

- Having a 4-week summer course
- Raise confidence
- Make physics make sense, use real life examples
- Community-building and encouraging a sense of belonging
- Recognizing the limitations of having admissions based solely on grades
- Stress the importance of playing to people's values (or organization's values)
- Oftentimes high school students do not have the resources to know which courses they

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	need to take in high school to meet the requirements • Teachers reaching out to Universities don't know who to talk to • Sharing resources – promotional materials that promote engineering as a diverse field • More applied curriculum: more problem solving workshops that bring practical problems rather than theoretical problems. Ask students how we can apply engineering knowledge to community problems.

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Project PRISM: Dual Interventions Improving Girls' STEM Interest and Boys' Respect for Girls' Abilities

Hilary Bergsieker is an Associate Professor of Psychology at the University of Waterloo, where she directs the Diversity and Intergroup Relations Lab. Dr. Bergsieker has expertise in trust formation and maintenance in diverse groups, social network analysis, and bias reduction, and was named a Rising Star by the Association for Psychological Science in 2017. She is a Fellow of the Engendering Success in STEM research consortium, collaborating with industry partners to use science-based interventions to advance the inclusion and success of women in engineering.

Improving Future Fit and current efficacy in STEM:

- Large gender gap in focus on future careers
- Intervention: boys' stereotypes about girls' abilities in STEM
- Improved perceptions: boys who underwent the intervention showed a change in perception about girls' abilities in STEM
- Intervention: girls being able to imagine themselves in STEM careers
- Significant improvement right after intervention, some improvement at the end of the week
- Interventions with multiple near-peer role models were particularly effective (versus adult role model)

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Gender Differences in Engineering Undergraduate Applicants

Lukasz Golab is an Associate Professor at the University of Waterloo and a Canada Research Chair in Data Analytics for Sustainability. He holds a PhD in Computer Science from the University of Waterloo (with Alumni Gold Medal) and a BSc in Computer Science from the University of Toronto (with High Distinction).

Analyzing essays from applicants about why they were interested in being an engineer:

- Reasons
  - Technical interests
  - Love of science
  - Extra-curriculars
  - Prior accomplishments
  - Contribution to society
  - Professional development
  - Family
  - Outreach
  - High school
  - Childhood dream
- Insights
  - Technical reasons appeared in 80% pf applications
  - Women also stated family influence, contribution to society, application (outreach)
  - Engineering is a profession that can help others and lead to a wide range of career options

Potential messaging: Pursue engineering not just because you can but because engineering is a good fit for your values and priorities.

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Panel: Stimulating a Love of STEM – Best Practices from Successful Outreach Programs

Janie Lumsden has had the privilege of teaching students in grades K through 12 in several Nova Scotia schools over the past 23 years. She currently teaches Communication Technology, Citizenship and IB History at Dr. John Hugh Gillis Regional High School in Antigonish - Home of St. FX University. She has coveted her role as a Techsploration Teacher for 9 years.

Terri Blackwell is the Superintendent of Education responsible for the process of development and implementation of Halton District School Board's new Innovation – Science, Technology, Engineering and Mathematics (I-STEM) Program at Aldershot High School.

Diana Wang-Martin is a chemistry teacher, STEM Teacher Advisor and International Baccalaureate Middle Years Program Coordinator at Glenforest Secondary School in Mississauga. She is a recipient of the Prime Minister's Awards for Teaching Excellence 2017 and 2018.

Rebecca White as the head of Engineers of Tomorrow, unlocks the potential of all STEM grads and engineers to become ambassadors for their own professions and industries, and to talk about their own 'why' with the skill, clarity, and heart that will inspire the next generation.

Janie—Techsploration.ca connects students with role models through the site, helps teachers facilitate these experiences; They will launch their pilot project in Hamilton in 2020.

Terri— I-STEM program

- Looking beyond the marks— what are the skillsets that students are bringing to post-secondary?
- Changing the program through ongoing interactions (especially with post-secondary schools)
- Tapping into students' heightened social consciousness
- Consulting with industry to create tools and programming for students
- Encouraging students to see themselves in post-secondary spaces
- Changing the language that frames design and tech contests— reframing as human-centred, something that girls respond to

Rebecca—Engineers of Tomorrow offers Engineer in Residence Program which is partnering a professional engineer with a classroom, putting a face to the profession, and creating positive STEM experiences for students.

1. How can we engage high schools to encourage their participation?
   - There are challenges to get into schools: finding a passionate teacher, STEM & Experiential Learning Coordinators, the right contact person
   - Attracting engaged groups to campus outreach activities
   - Tours and events (new facilities)
   - Using campus visits and tours as recruitment for other events

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	2. How can we make these visits more appealing to faculty members? How can we best engage students? • Encourage knowledge mobilization, create more incentive for faculty, develop relationships • Identify top feeder schools and focus recruitment and outreach efforts at them • Differences between recruitment and outreach teams; tours done by work-study students • Workshops for high schools on a daily basis • High schools to nominate girls that can then shadow classes in university and meet mentors • Being very specific about the required commitments • Active engagement with alumni – host alumni events

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Panel: Measurement to Inform Outreach/Recruitment Efforts

Dawn Britton is the Associate Director of Engineering Outreach at the University of Toronto, and a leader in STEM education in Canada. Britton devotes herself to various outreach efforts, including the Da Vinci Engineering Enrichment Program (DEEP) Summer Academy, Jr. DEEP, Go Eng Girl and In-School Workshops.

Frank Bouchard is Manager of Outreach for the Faculty of Engineering at the University of Ottawa. Frank is also an award winning entrepreneur and inventor with his company Wipebook. Frank Bouchard was named one of Canada's future Leaders of 2014 in Maclean's magazine and was recognized as Ottawa's 40 under 40 at the age of 27.

Lindsay Bolan is Manager, Strategic Recruitment & Enrolment with McMaster University's Faculty of Engineering. At McMaster, Lindsay has implemented data-driven strategic recruitment initiatives with specific goals to increase the number of female students in Engineering.

1. What methods do you use to track the success of your outreach? What do those data reveal?
   - Measuring success not just from success in campers, but also university students
   - Developing programs to track individual student's journeys along the pathway

2. For schools who are just starting to collect metrics / data, what would you recommend?
   - Know what you want to measure and why
   - Have five key variables that have been identified as most valuable
   - Identify short-term and long-term goals
   - Build a database
   - Know your Dean's expectations and frame it the best way to be heard
   - Invest in an online tracking system

3. For converting female applicants to incoming students, what strategies have worked best?
   - Women are less likely to accept offers into engineering, but are more likely to get offers
   - Women are more engaged applicants (more likely to open emails, looking for information)
   - Using this knowledge to incorporate important themes (i.e. finding your family at school, learning a breadth of knowledge at university, telling the stories of students in a different way that extends beyond "just" your degree… students are many things)
   - Sending messages about who students will become once they come to universities using appropriate messaging in recruitment brochures

4. What insights from research / data have changed your outreach and recruitment approaches?
   - First touch point at university (welcome week) is so crucial

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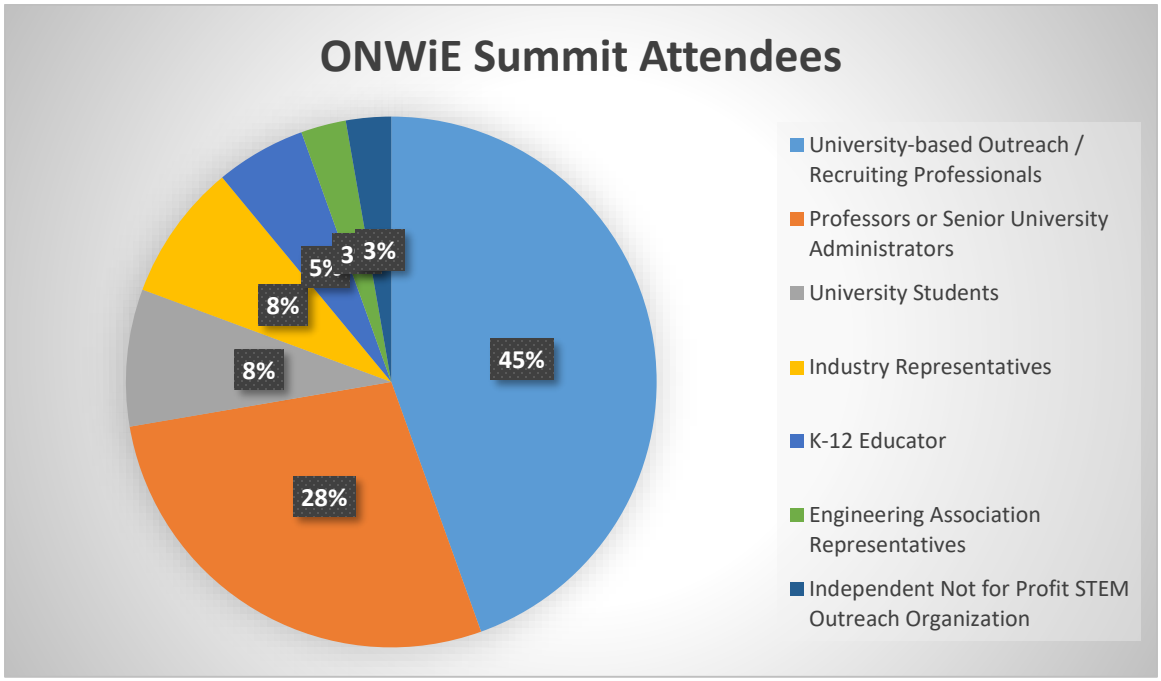
	• Relationship-based Programs that have more face time with a mentor are effective • Being part of the university community before attending really makes a difference • Building relationships with communities by having long-term staff members in recruiting

Summit Feedback from Participants

38 responses to the online feedback survey:



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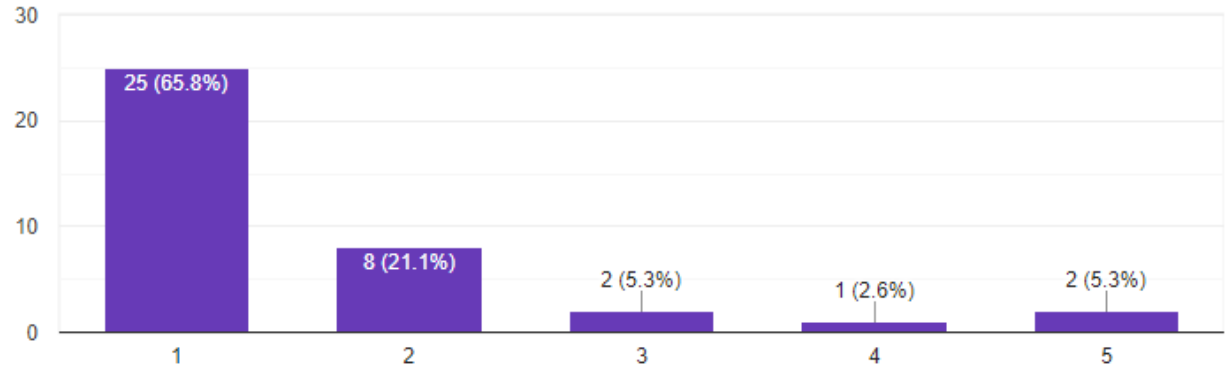
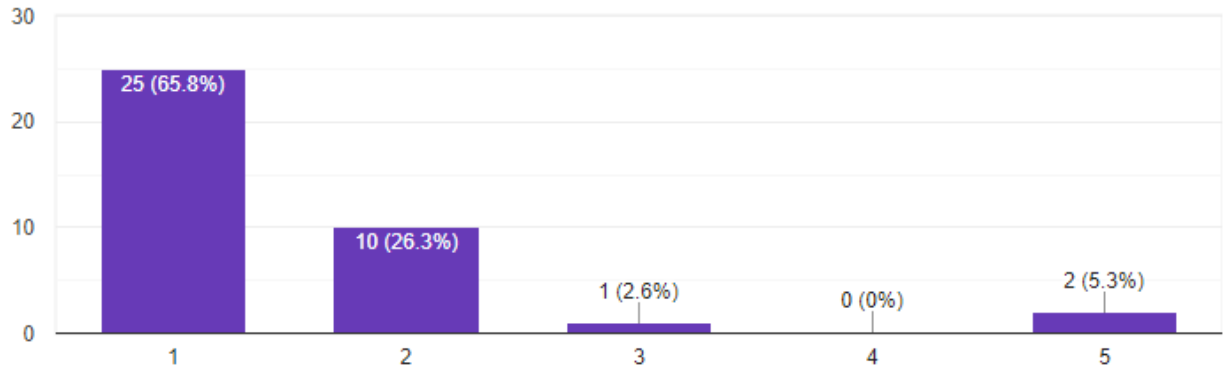
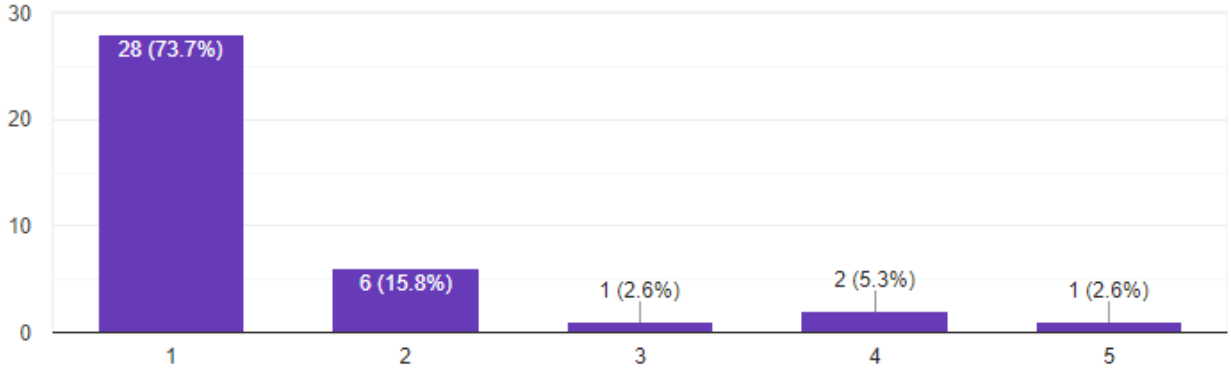
The Summit venue was convenient and accessible. (1:Strongly Agree 2:Agree 3:Neutral 4:Disagree 5:Strongly Disagree)



The Summit was well organized. (1:Strongly Agree 2:Agree 3:Neutral 4:Disagree 5:Strongly Disagree)



Discussion and knowledge sharing played an important part of the Summit. (1:Strongly Agree 2:Agree 3:Neutral 4:Disagree 5:Strongly Disagree)



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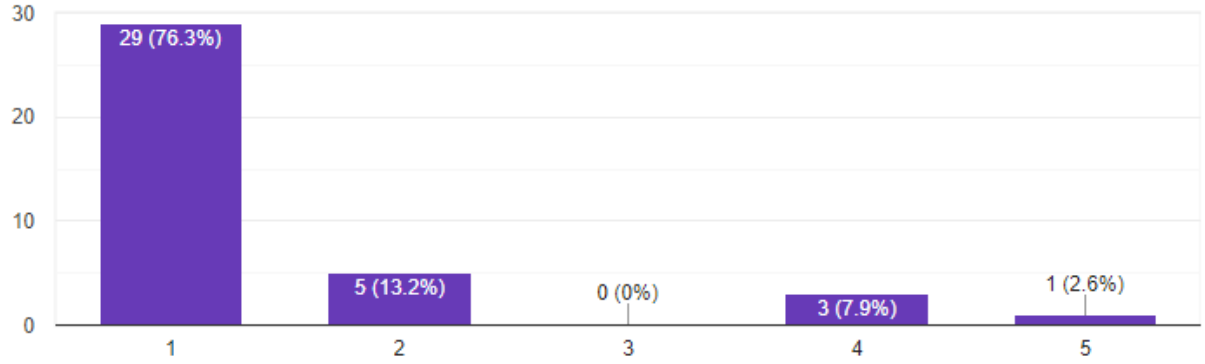
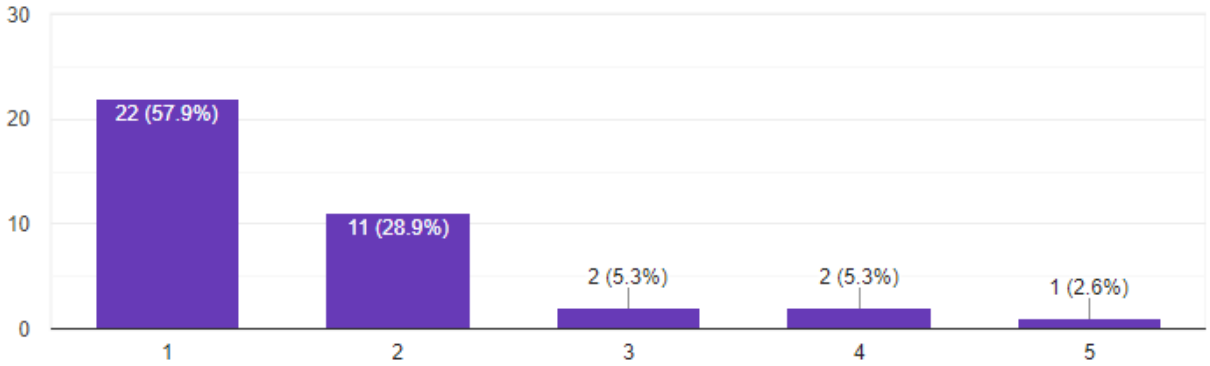
Overall, I think the Summit was helpful and enjoyable for me. (1:Strongly Agree 2:Agree 3:Neutral 4:Disagree 5:Strongly Disagree)



The Summit was a great networking opportunity for me. (1:Strongly Agree 2:Agree 3:Neutral 4:Disagree 5:Strongly Disagree)



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Participating Organizations/Companies:

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- Canada Learning Code
- Carleton University
- City of Hamilton
- Conestoga College
- DiscoverE
- Glenforest Secondary School
- Laurentian University
- McMaster University
- NSERC Chair of Women in Science and Engineering Ontario
- Oakville Hydro
- Ontario Society of Professional Engineers (OSPE)
- Ontario Tech University
- Queen's University
- Ryerson University
- Shannon M. Pole Solutions
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- Techsploration
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- University of Alberta
- University of British Columbia
- University of Calgary
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Title Sponsor of Summit Dinner:

ONWiE Partners:

Attendees' Testimonials:

"This conference was awesome! I love how you organized the tables so groups were split up. This allowed for some really great discussion. I also enjoyed the diverse group of people from post-secondary, industry, and teachers. Thanks so much for this awesome opportunity."

"Great job on the program design and the actual printed program. I liked how everything was designed to nudge participants towards action steps."

"Your team did a fantastic job, of keeping the presentations light and relevant. I found myself really engaged throughout the summit"

"It was a fantastic event. Well organized and Kim did an amazing job facilitating. The smaller group discussions were meaningful and many connections were made. Thanks so much for your hard work!"

"The conference was excellent. Really well done. Maria was amazing. The ONWiE team did outstanding work."

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ONWiE Summit receives advice, inspiration from Maria Klawe

Bold dreams and first steps.

That's what Maria Klawe – one of North America's leading advocates for increasing the participation of women in the STEM fields – brought to the 2019 Ontario Network of Women in Engineering (ONWiE) summit in Hamilton.

Offering a combination of energetic inspiration and practical advice, Klawe kicked off a two-day conference that brought together nearly 100 women from across the province and beyond.

A leading computer scientist, Klawe has served as president of California's Harvey Mudd College since 2006, and helped the school reach gender parity among students in its computer science, engineering and physics departments.

Fifty per cent of the school's computer science faculty are also female, and Klawe said the college is turning its attention to improving opportunities for other underrepresented groups.

Those achievements were the result of a number of small, replicable steps, she noted, using her keynote speech and workshop session to press the message that everyone can be a catalyst for change.

"I think the most important thing to understand about change that it often starts with something small," she said. "The thing everyone can do is talk about why it is absolutely essential to have more women in tech."

Changes at Harvey Mudd included remodelling the introductory computer science course, placing students together in sections based on previous coding experience, providing summer research opportunities for females, and taking groups of students to the Grace Hopper Celebration of Women in Computing conference.

Bringing together women from academia and industry, the ONWiE summit focused on ways to attract more females to study and work in engineering and technology fields.

Klawe, clad in a t-shirt emblazoned with the slogan, "Educating the next generation of passionate problem solvers," said schools need to look at the design and delivery of courses to make them supportive and engaging to young women who want to make an impact on the world.

"Many women are more motivated to learn something because of what you can actually do in the world with it," she said.

She applauded programs like ONWiE's Go Eng Girl and Go Code Girl that are designed to spark interest in engineering and computer science among middle and high school students.

Klawe also centred out the efforts of McMaster and Kim Jones, ONWiE chair and McMaster professor of chemical engineering, for raising the visibility of the gender gap in technical fields.

"This summit has been an amazing experience, and I am so proud of what has been done at McMaster and at ONWiE," she said.

Before a mixed audience at her keynote speech, Klawe urged men to help drive change by promoting the work of women and refusing to serve on all-male panels of experts.

“You need to know the leading women so you can promote them,” she said. “Lean forward and support others in leaning forward.”

A recipient of numerous prestigious awards for her leadership, Klawe was granted an honorary degree from McMaster in 2016.

Born in Toronto, she held faculty and leadership positions at the University of Toronto and the University of British Columbia before serving as Dean of the School of Engineering and Applied Science at Princeton University from 2003 to 2006.

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Encouraging girls to engineer a better world

The need to frame engineering in a female-friendly way was a key theme of the recent 2019 Ontario Network of Women in Engineering (ONWiE) summit, held in Hamilton and hosted by McMaster.

Engineering is about changing the world – and that's a message girls need to hear.

Research has shown that female students are more attracted to careers that have a positive impact on society. At the two-day ONWiE summit, speakers from across the province and around the world shared the most innovative ways they are reframing engineering to attract more women to the field.

The Halton District School Board is launching a new four-year innovation and STEM focused program that is using human-centred design challenge language to attract girls.

"We don't ask them what they want to be, we want to ask them what problem they want to solve," explained Terri Blackwell, the board's superintendent responsible for developing and implementing the program.

The summit also heard about a series of free after-school workshops in New Zealand that focus on humanitarian issues ranging from recycling plastic to disaster-proofing to clean water, and offer girls a chance to explore the real world application of engineering principles.

McMaster chemical engineering professor Kim Jones chairs the ONWiE organization, which coordinates the efforts of Ontario universities to recruit a more diverse engineering student population. She says it's important for society to increase the number of women who are excited about the prospects that engineering can offer them.

"It's not just a woman problem, it's an all-of-us issue," said Jones. "Everybody needs to be engaged in ensuring that the skills and abilities and talents of women can feed into solving the world's problems together."

The networking summit brought more than 100 educators, industry professionals and others to Hamilton to learn from each other.

"It's one thing to do things in isolation with our own ideas but we'll all do a better job if we learn from one another's great ideas," said Jones.

A University of Calgary initiative sees the school reach out to students who studied high school biology rather than physics, to offer them a route into engineering through the completion of a four-week bioengineering program that delivers crucial physics skills through a project-based course.

Qiao Sun, senior associate dean with the university's school of engineering, said that outreach efforts related to the bioengineering initiative attracted a mainly female audience, as compared to traditional engineering outreach messages that attract mainly male attention.

The ONWiE summit also heard from researchers at the University of Waterloo who looked at developing interventions to help girls perceive their traits, talents and interests as aligning with STEM careers, as well as interventions to improve the respect that boys have for girls' STEM abilities.

"We believe this is a useful intervention for changing a chilly climate into a more welcoming climate for girls," said Hilary Bergsieker, assistant professor of psychology.

Monica Black, a fifth year student in Electrical Engineering and Management at McMaster, said the summit offered her a new perspective on the work being done to champion diversity, and gave her valuable contacts across the country.

"I've developed a network just from the people I've met here," said Black. "As part of the McMaster Women in Engineering Society, I look forward to searching out some of these women to bring them out to our professional development days and bring this knowledge back to McMaster."

While ONWiE's trademark outreach programs Go Eng Girl and Go Code Girl, aimed at girls in Grades 7-10, have been successful, Jones said the organization is looking to develop additional programs that show girls how technical skills relate to tangible things they care about, such as climate change, sustainability and family.

Recent decades have seen a consistent increase in the number of women applying to Ontario's engineering programs, with women making up nearly a quarter of applicants in 2018.

At McMaster, women make up 35 per cent of this year's incoming engineering students.

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