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.