



She wants you! Join the chic geek revolution **Kylie Toh**, alumna

We can do it!

Where's it STEM from? There's a lack of women enrolling in Science, Technology, Engineering and Math (STEM) post-secondary programs across Canada. Mount Royal University takes aim at this nation-wide conundrum as a group of innovative faculty and alumnae carve away the stereotypes surrounding women's roles in computer science, math and tech-startups.

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From her oversized spectacles to her stylish wardrobe and well-paired accessories, you could easily make a snap verdict that Kylie Toh is, in a word, "chic."

She's also a self-professed geek.

However, the conclusion about her latent nerdiness is harder to draw from first — let's just say it, judgmental — glance. But, make no mistake, Toh is one proud chic geek.

"A nerd," says the Mount Royal alumna, with a smile.

She is a founder of Chic Geek, a Calgary-based organization that strives to foster diversity in the high-tech and startup communities by educating, engaging and empowering women. The name plays off of two stereotypical boxes that Toh often sees women lumped into — pretty or smart. The two stereotypes seldom seem to go hand-in-hand.

"Take a stand with us, discover your nerdy side and challenge the stigma around being a geek," reads Chic Geek's website. In addition to holding new technology workshops for girls and women (they've had girls as young as six-years-old attend) on everything from coding to Photoshop, they host speaker and networking events and casual-learning sessions, strive to build leadership opportunities and create connections for women in the network.

"Female enrolment in post-secondary is on the rise across Canada, yet we're seeing a decrease in those women taking up computer science, which is really unfortunate," explains Toh.

"I grew up with a lot of girls in my life who said things like, 'I'm bad at math. I don't get computers. I'm bad with technology.' You hear that kind of lexicon enough and you begin to think, 'OK, well I'm a lot like these girls so

maybe I'm not good at math either.' It becomes a part of the subconscious language we speak as women."

If she could, Toh would eradicate that language from our collective common drive in the same fashion anti-malware software wipes a computer virus from a MacBook.

She's hard-wired to help other women find career paths not only in tech-startups and computer science, but in all Science, Technology, Engineering and Mathematics (STEM) fields.

She's not alone in her concern over the lack of women enrolling in STEM studies. Encouraging university students to consider STEM program areas has long been on the agenda of government and industry leaders, as well as post-secondary institutions. Seeding Canada's future workforce with STEM graduates is a defining outcome of national innovation strategies. The number of grads the nation produces can be linked back to how we measure up globally in competitiveness and economic prosperity.

Mount Royal has exceptional programs for students to choose from the Faculty of Science and Technology and through many of the various undergrad options across campus.

But something is happening in STEM-focused classrooms that frustrates even the most logical of problem-solving professors. There simply aren't as many female students flocking to lecture halls and labs as there are male.

"Last semester, I had a class with one woman in it," says Ricardo Hoar, chair of Computer Science and Information Systems at Mount Royal. "One!"

According to Statistics Canada, while women

A WOMAN'S PLACE IS IN THE BOARDROOM



A woman's place is in the boardroom Patti Derbyshire, faculty

represent the majority of young university graduates, they are still under-represented in STEM fields.

A 2013 Insights on Canadian Society, Statistics Canada report, gender differences in science, technology, engineering, mathematics and computer science (STEM) programs at university, notes that women accounted for only 39 per cent of university grads aged 25-34 with a STEM degree in 2011, compared with 66 per cent of university grads in non-STEM programs. Among STEM grads aged 25-34, women accounted for 59 per cent of those in science and technology programs. Not bad, however, only 23 per cent graduated from engineering programs and 30 per cent of those graduated from mathematics and computer science programs.

So what's it matter if there happens to be more men graduating in STEM program areas than women?

"That doesn't create good balance. That doesn't create good discussion. It's simply better when you have a balance of males and females at the table," explains Hoar. "The danger of male-dominated software development is that it can devolve to a 'bro-grammer' mentality, which considers only the male views. Balanced teams are forced to consider more perspectives, and produce better solutions."

Together, Toh, Hoar and a number of other Mount Royal graduates, professors, students and other supporters are making it their mission to be part of the solution to Canada's lack of female STEM graduates. The solution comes not only from Mount Royal's technology-focused faculties, it comes from across the campus. There many leaders in the Mount Royal community aiming to get more women into programs that could lead to STEM careers. There are also a number of inspiring role models in the form of faculty and alumnae for young women to look up to.

"I thought that I started Chic Geek because I wanted to be a coder. Coders build amazing things and I wanted to be part of that," explains Toh, who graduated in 2012 with a Bachelor of Communication in Public Relations. "But I realized that my skills are actually in building other types of things, such as communities."

Toh didn't fully flesh out her interest in technology until she was in the last year of her degree.

"I can speak the language and understand the technology enough to help communicate around it," she says.

Which may be the first step to getting women enrolled in a STEM career field, explains Patti Derbyshire, chair of Entrepreneurship, Marketing and Social Innovation at Mount Royal's Bissett School of Business.

"I believe one of the gateways to STEM for women is through entrepreneurial ventures, or at very least, entrepreneurial mindsets," Derbyshire says, adding that many of the great 'noggins' behind successful tech-startups don't necessarily come from science, engineering or math undergrad streams.

"If you have the basic technological literacy and you can work on a team where there are technology specialists, then you have a place at the table," she says.

When she's not teaching marketing, Derbyshire is busy participating in a number of innovative projects that blend business acumen, art and tech. She is a regular contributor to Calgary's Beakerhead festival, an annual mash-up of Science, Technology, Engineering, Art and Math (STEAM)-based programming. Most recently, Derbyshire has set her sights on a new venture, building motorcycles especially engineered for women. As cofounder of Torch Motorcycles, Derbyshire has helped assemble a team of entrepreneurs, engineers, mechanical craftspeople and even a fashion designer, who are working together to launch a company that will make craft-built motorcycles and motorcycle products specifically engineered for female riders.

She is also one of several faculty members who helped a group of Mount Royal alumni found Design4Change, a boutique-marketing agency housed at the University. Design4Change works with clients from a variety of industries, but it is keenly involved with a diverse set of high-tech startups. The Mount Royal-born agency has worked with everyone from Long View Systems (IT Services) and Anow (a web-based software company), to TLink (a golf-gadget tech-startup also founded by MRU alumni).

Both Toh and fellow Mount Royal alumna Heide Calderon Ghelfi were at some point in their post-secondary careers part of the Design4Change team.

BECOME A
STEMINIST
YOUR
COUNTRY
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YOU



Become a STEMinist, your country needs you **Heide Calderon Ghelfi**, alumna

Much like Toh, Calderon Ghelfi took a roundabout path to her current information technology-based career as an IT lead with a major energy company's Calgary office. She started at Mount Royal as a journalism student, realized she was interested in technical writing and transferred programs in her second semester, graduating from the Bachelor of Applied Communications — Technical Writing (now the Bachelor of Communication — Information Design) in 2003. After several successful years in the field, Calderon Ghelfi was yearning to know more about the technology she was helping to translate for users.

"I was working at a software company and I just loved it so much," she says.

"I couldn't program to save my life, but learning about the technology and how it actually gets rolled out to the masses was extremely interesting to me. Technology is constantly changing and keeping up was challenging for me, so I decided to go back to school again."

This time to Hoar's classroom at Mount Royal, completing her Bachelor of Computer Information Systems in 2011.

Calderon Ghelfi says she's never felt intimidated, discouraged or held back by the men she works with.

"It's just that there's not a ton of other women around — at all," she says.

"Sure, I've had men treat me poorly because they see me walk into the room and the assumption is, 'who's this little girl with her MacBook?' I've been stereotyped. But, it doesn't happen very much and it's not just men. Women have preconceptions as well. It's a problem we have as a society, not as one sex versus the other."

She adds the good news is that the information technology industry, "especially in oil and gas in Calgary," is eager to add more women to their tech-teams.

"Females bring this different element to technology because we think differently. One of the roles I've had is as a business analyst and that's about bridging the gap between people and the technology. It's a role that requires logical skills, as well as high-level communication skill," she says.

"I find that women tend to take on those roles more so in the technology field than programmer roles.

Maybe it's because women have a different set of communication skills. I'm not sure. What I do know is that I don't work with many females and I would like that to change. I think the first step starts before post-secondary, in our homes, in the way we speak to our little girls."

She points to programs such as ExploreIT as an example.

Spearheaded in 1999 by several female technology industry leaders and academics in Calgary, ExploreIT is an initiative between Mount Royal, SAIT Polytechnic and the University of Calgary. The program cumulates in an annual interactive conference for Grade 9 girls to explore the world of information and communications technology and increase awareness of STEM career options that will inspire them to shape their potential futures.

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Heide Calderon Ghelfi,
Mount Royal University alumna

"When you're a teenager and you're thinking of applying to universities, if you aren't exposed enough to these kind of career paths ... well, someone says 'you can be a business analyst' to you and it's like, 'That's not sexy! What does that even mean?!'" says Calderon Ghelfi with a laugh. "Initiatives like ExploreIT show girls from a young age the possibilities in a post-secondary degree in math or computers."

Mount Royal Mathematics associate professor Pamini Thangarajah coordinates Mount Royal's contribution to ExploreIT. She is both an impressive role model for young women aspiring to math-related academic advances, as well as a passionate advocate and recruiter. This past February (2015), Thangarajah was asked by Alberta Education to be a member of the Elementary Mathematics Professional Learning Planning Group — a group that includes

NO GIRL
LEFT BEHIND!



No girl left behind **Pamini Thangarajah, PhD**, faculty

Alberta Education, Alberta Regional Professional Development Consortia, the Alberta Teachers' Association and post-secondary representatives. The group provides additional teacher professional learning opportunities and implementation support for teachers related to elementary mathematics.

"From what I can tell in my own classroom, there is no difference in the way girls and boys learn math," says Thangarajah, PhD. "The element we have to overcome is the feeling that girls don't think they can do it. That's the issue."

When she was approached in 2001 to get Mount Royal involved with ExploreIT, she was happy to take the lead and eager to provide teenage girls with an introduction to subject matter she was actively discouraged from pursuing when she was their age.

Thangarajah was born and raised in Sri Lanka.

"A place where the math and science field is dominated by men," she says. "Women doing math, well, that's simply not heard of."

She didn't let that stop her. After completing her undergrad, Thangarajah received a scholarship to Marquette University (University of Wisconsin-Milwaukee) in 1990 to complete a master's degree in abstract algebra.

While Sri Lankan society wasn't keen on Thangarajah completing her post-secondary education in mathematics, she did have the strong support of her immediate family. She says this is key for any young woman pursuing a future in a male-dominated career area.

"We need to create support systems," she says.

Thangarajah thrived in the U.S. post-secondary system, and while she says there were still very few fellow female students in her classrooms, her male colleagues were supportive of her studies. The university even fast tracked her to a PhD level.

"I fell in love and got married in 1993 and gave up my studies. It is the first thing I've ever quit," she says, but adds that when she and her husband moved to Calgary, she decided to go back to school, completing her PhD at University of Calgary in 2001. She has been teaching ever since and hopes her story will help to inspire and remind her own math students that pursuing one's

education can come at various stages in a person's life.

"If I can help people, girls, in a way where they can determine and plan their own path, then I am happy," says Thangarajah. "We can do it! Math, science ... We can do it. We need start thinking this way and talking this way."

When Thangarajah became involved with ExploreIT, she had no formal committee or group to help her coordinate or run the day-long programs for the 50-some Grade 9 students who would descend on campus.

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Pamini Thangarajah, PhD,
Mathematics associate professor

"We had no funding at that time or help," she says. "But faculty supported the initiative and helped to create numerous sessions for the girls."

Thangarajah is proud to report that Mount Royal now hosts more than 200 Grade 9 students annually as part of the conference, offering a variety of programming on everything from designing robots to the study of DNA extraction from strawberries, all designed to encourage junior high-aged girls to set a course in high school that will give them the option to pursue STEM areas in post-secondary.

"The girls come out of the sessions feeling wonderful. Much of the time, they didn't even realize what they could accomplish, or what fields of study were possible in their future," Thangarajah says.

Professors such as Thangarajah and Hoar aim to attract more students to Mount Royal's computer science and math classrooms.

"I know that our department here at Mount Royal isn't going to solve a national STEM crisis. But we can certainly try," says Hoar. 🐦