



“Never let people’s initial assumptions of you change the way you impact the world.”

- Denisa Dica

Image features Denisa Dica, Operations Manager, The Canadian Shield

WOMEN IN SCIENCE: SHIELDING CANADIANS FROM COVID-19

By Eden Hennessey and Skye Hennessey
The Laurier Centre for Women in Science (WinS)

Since late March 2020, Denisa Dica starts her day by suiting up in a mask and heading to a 50,000 square foot building. The facility is designed to produce millions of face shields named ‘The Canadian Shield’ - the PPE (personal protective equipment) that is critical in protecting health care and other essential workers from COVID-19.

Dica, as a skilled Lead Technologist, has pivoted from working on 3D printers with educational technology company InkSmith Ltd., to managing hundreds of employees at the new spin-off company called The Canadian Shield.

Following the emergence of COVID-19 in Canada, Laurier alumni Denisa Dica collaborated with InkSmith Ltd., colleagues Jeremy Hedges (also a Laurier alumni), Doug Braden, and Andrew Brumwell to create a new and re-usable face shield, distinct from others that are limited to single-use. The team made several iterations, improving the design each time to ensure comfort and durability, embodying the user-centered design thinking process foundational to InkSmith’s values.

The design resulted in InkSmith Ltd., receiving their Health Canada Medical Device Establishment License to produce the face shields. Dica is joined at The Canadian Shield by a dedicated group of employees and volunteers, including Kristine Boone, a quantum physicist completing a PhD at the University of Waterloo.

The Laurier Centre for Women in Science (WinS) sat down (virtually) with Kristine and Denisa to ask them about their recent pivot and how the pandemic might influence the context for women in science.

We first asked what it was like to pivot from a small business to a much larger scale. Dica in a word, stated “incredible.” Dica started out in a Science Maker lab on Laurier’s Waterloo campus and learned many of the skills (CAD design, laser cutting, design and assembly) she’s using now from mentor Ron Daniels. Dica has quickly adapted to her leadership role, and remains committed to all aspects of the job, including ensuring machines and presses are functioning efficiently.

“...enabling all the voices in the room proved incredibly valuable for the growth and development of the company.”

- Kristine Boone



Kristine Boone, Volunteer at The Canadian Shield & Physics PhD Candidate, Institute for Quantum Computing

In addition to employees, volunteers like Boone have been onboard with InkSmith Ltd., and The Canadian Shield since the early days. Boone has seen the company grow from the original concept to an organization of over 300 employees.

Boone enjoys volunteering with PPE production. For her, a systematic approach to problem-solving and critical thinking easily transfer from her work in quantum physics. These skills proved incredibly valuable during the beginning of production and development at The Canadian Shield.

COVID-19 & THE IMPACT ON GIRLS & WOMEN IN SCIENCE

While some research has shown that the pandemic has negatively impacted certain identities (i.e., women are publishing less), Dica and Boone noted how women in Canada (like Ontario’s Dr. Theresa Tam and Alberta’s Dr. Deena Hinshaw) have created space for girls and women to see themselves in leadership and government through public media representation.

Dica says she’s noticed how the urgent need to address COVID-19 has contributed to an environment in which people are more receptive to a greater number of ideas from a greater number of sources.

Boone similarly noted how the recent crisis has inspired many to consider how they use their voices in politics and healthcare; two fields in which studies have shown that women may be considered incongruent with stereotypes of professional roles (e.g., as decisive, assertive). Whereas women in politics may be considered stereotype incongruent because they are leaders, women in healthcare may be stereotype congruent if they are in caretaking roles like nurses, but stereotype incongruent if they are scientists and engineers (see Figure 1).

Such perceptions may underlie the persistent shortage of women in STEM. Indeed, women’s underrepresentation is due to multiple factors (negative stereotypes, sexism at school and work). While these factors have been well-documented, they are often not communicated to the public.

TURNING THE TABLES ON STEREOTYPES

A recent photo-research exhibit by Social Psychologist Eden Hennessey of WinS with local photographer Hilary Gauld, featured Dica and Boone.

The exhibit titled #TurningTablesInSTEM features portraits of women and girls in science paired with research on how women are perceived in science roles.

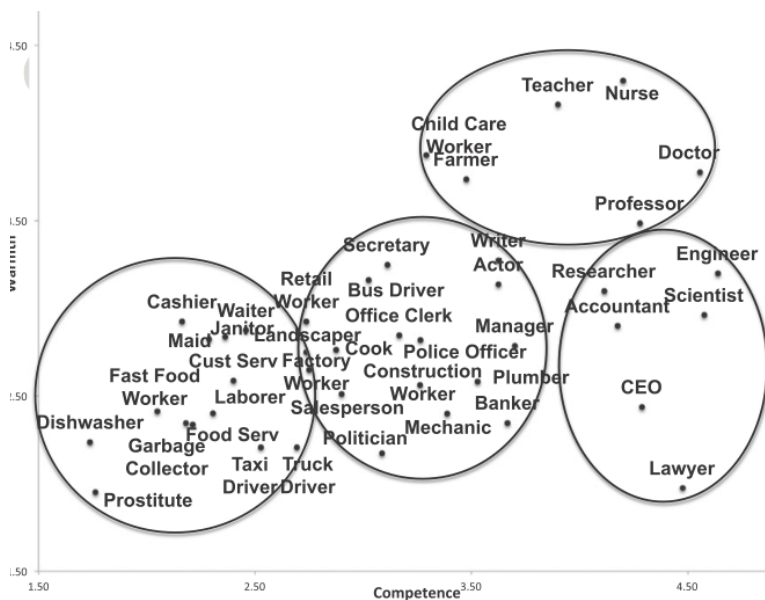


FIGURE 1 SHOWS THE STEREOTYPE CONTENT MODEL, ILLUSTRATING PEOPLE’S PERCEPTIONS OF DIFFERENT PROFESSIONS ALONG UNIVERSAL DIMENSIONS OF WARMTH AND COMPETENCE (FROM FISKE & DUPREE, 2014)

"Without the determination of everyone on this team, none of this would have been possible."

- Kristine Boone

Dica’s image titled “3D Modelling at the Table” is paired with research showing that when women perceived as attractive and feminine, they are less likely to be deemed scientists. In her career as a young woman in tech, people often underestimate Dica's abilities; an experience that could be linked with the tendency to associate science with masculinity.

Dica says that she still encounters people who are surprised to see her in an Operation Manager’s role. However, Dica recognizes that these perceptions are erroneous and sometimes nefarious. In response, she refuses to ‘dial back’ aspects of her identity for the benefit of others, instead stating that, “I can be true to myself; I don’t need to change but stereotypes do.”

Boone’s image titled “Uncertainty at the Table” focused on a different message; that is, how some scientists face uncertainty when choosing a career in academia versus industry. As Boone nears the end of her PhD in Physics, she has decided to pursue a career in industry. She noted that volunteering with The Canadian Shield Boone gave her a unique opportunity to apply transferable skills gained in her PhD to manufacturing.

In doing so, she highlights how scientific education and training can be useful in advancing understanding of how the world works, but also has practical applications.

As Dica and Boone enter the third month of manufacturing PPE, we asked them about how we can all use science in our daily lives to keep each other safe and promote equity in STEM. Dica quickly exclaimed, “Listen to scientists!” and warned of politicizing pathogens to justify attitudes or actions.

Boone added that some people do not see the pandemic as an ongoing threat, although many scientists are noting that we have not left the ‘danger zone.’ She notes that we can all, “take the time to fact check,” so that our behaviors are ultimately guided by scientific evidence rather than opinions or feelings.

The tendency for people to be skeptical about science remains concerning; a 2018 survey of Canadians showed that 29% do not trust scientific data because it changes. This lack of trust may undermine the ability to see scientific findings accurately, fueling false beliefs and contributing to confusion and ultimately, risk.

Just as science continuously changes based on new information, Dica and Boone exemplify the ability to adapt to new challenges, using science as a framework.



Kristine Boone with Canadian Shield PPE ready to ship.



Denisa Dica on the manufacturing floor of The Canadian Shield.



L to R: Doug Braden, Andrew Brumwell, Denisa Dica, Jeremy Hedges, Jessica Braun and Richard Wright-Gedcke.

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