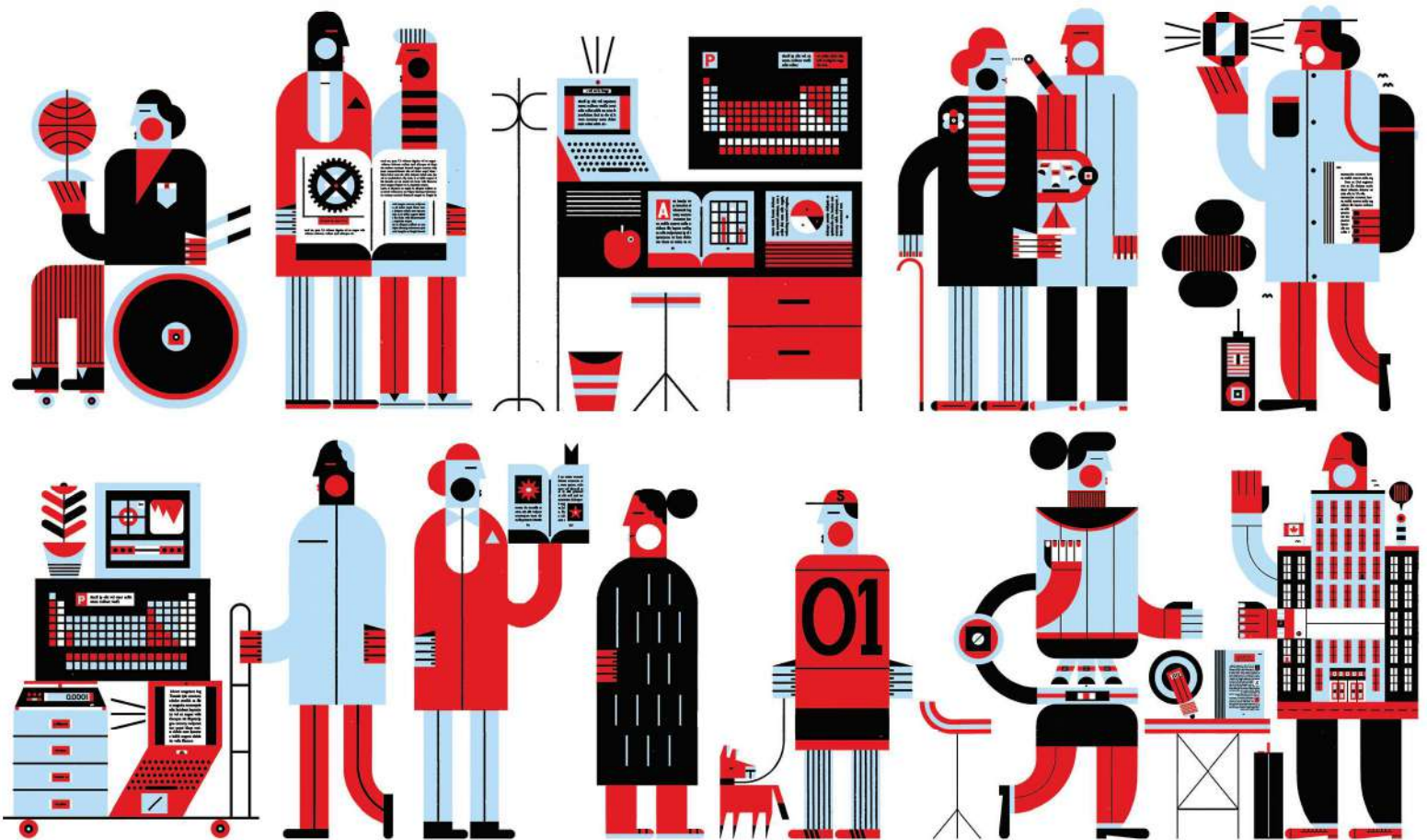


Evaluation of the Chairs for Women in Science and Engineering program

July 2021



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Acknowledge

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Evaluation of the Chairs for Women in Science and Engineering program
The Honourable François-Philippe Champagne, P.C, M.P. Minister of Innovation,
Science and Industry
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The Chairs



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Introduction

In 2020, the Natural Sciences and Engineering Research Council of Canada (NSERC) proceeded with the evaluation of its Chairs for Women in Science and Engineering (CWSE) program (hereafter the program). This document presents the findings that emerged from this process, including recommendations to be considered for the ongoing management of the program. This was the first evaluation to be conducted since Dr. Monique Frize was selected as the first Chair in 1989.¹ As such, the evaluation process provided an opportunity to reflect on the overall relevance of the program, the lessons learned from the experience of the 18 women who have thus far been selected as chairholders, and identify any opportunities for improvement as applicable.

More precisely, the evaluation explored the positioning of the program in the overall efforts

deployed across Canada to promote gender equality in Canada and to further the involvement of women in the fields of science, technology, engineering, and mathematics (STEM). The evaluation has also documented the range of impacts that the program has had on both program participants and the chairholders themselves. In doing so, the evaluation identified factors or conditions that may support or hinder the achievement of the program's expected results.

The evaluation process integrated gender-based analysis plus (GBA+) considerations. In particular, the evaluation explored the extent to which efforts have been made to ensure that no systemic barrier could limit the access to the program and its associated benefits among those women whom the program is attempting to support.



1. Following Dr. Frize's tenure as Chair, the program was restructured in 1996 to become CWSE as currently delivered, with chairholders in each of the five regions covered by the program.

The CWSE Program

NSERC support

The program's primary purpose is to allow the selected chairholders to engage in activities that promote the participation of women in science and engineering. To this end:

- Each Chair is approved for a five-year term, renewable for an additional term of three to five years.
- NSERC provides an initial \$40,000 grant per year and matches cash and in-kind contributions from the host university or from a partner for up to \$70,000 per year.
- Should the host university provide cash contributions of \$20,000 per year to secure support from a postdoctoral fellow or research engineer, NSERC will match it with \$25,000 per year.

The program supports one chairholder in each of the following five regions: Atlantic, Quebec, Ontario, Prairies, and British Columbia/Yukon.

At the time of the evaluation, NSERC had invested approximately \$8 million in the program (covering the period from 1996 to 2020).



Activities undertaken by the chairholders

With the support provided by the program, each chairholder is expected to contribute up to 50% of her time to chair-related activities.

The chairholders engage in a range of activities that promote science, explore systemic issues that may limit the participation of women in science and engineering, and include public advocacy and role-modelling. Each chairholder develops an action plan that describes more precisely where she intends to focus her efforts. This may include engaging students in elementary and secondary schools or concentrating on undergraduate or graduate students. The activities can aim to raise awareness of professional opportunities in science and engineering, encourage women to pursue studies in these fields, or enhance our understanding of systemic barriers that limit women's engagement in science and engineering.

Expected results

The program has been pursuing three key objectives :

- Raise the level of participation and retention of women in science and engineering as students and professionals;
- Provide female role models who are accomplished, successful and recognized researchers in science and engineering;
- Build a communication and networking strategy to ensure a regional and national impact on opportunities for women in science and engineering.

More recently, the program has added an emphasis on intersectionality, to ensure that all women, including those from underrepresented groups, do not face systemic barriers in accessing the program.²



Selection of chairholders

To be considered for a Chair, a candidate must self-identify as a woman and she must meet NSERC's regular eligibility criteria to apply for or receive NSERC funding. She must hold a faculty appointment at a Canadian university, hold a current NSERC Discovery Grant, or be awarded one prior to taking up the Chair. The application must also include a minimum of one supporting organization from the private or public sector, which is expected to provide cash or in-kind contributions.

A CWSE selection committee, composed of representatives from Canadian universities and colleges, foreign institutions, and industry and/or government laboratories, is responsible for reviewing applications and selecting new chairholders as required. In doing so, the committee considers the research achievements of the candidates, their experience in equity, diversity and inclusion (EDI) issues, their proposed strategies and work plan, as well as the support provided by the host university and other supporting organizations.

2. Intersectional dimensions include age, education, sexual orientation, Indigenous status, disability, language, race, ethnicity, culture, etc. For more information about the program, please consult: https://www.nserc-crsng.gc.ca/Professors-Professeurs/CFS-PCP/CWSE-CFSG_eng.asp

Methodology

Evaluation questions

To provide a rich and relevant perspective on the program, the evaluation targeted the following six questions:

Relevance

- Women in STEM: where are we in 2020?
- Why is it important to attract and retain women?
- Why is there a role in 2020 for the federal government in this field?

Effectiveness

- What are the most common challenges addressed by the chairholders?
- What strategies have been implemented to address these challenges?
- What changes resulted from the implementation of the chairholders' strategies and action plans?

Methodology and limitations

The methodology used to address the evaluation questions included:

- Six case studies (four regional, one for the early Chairs and one for the National Network) that included interviews with chairholders and their partners (n=30);
- A file review of Chairs' applications and activity reports for their first and second terms as applicable;
- A document and literature review, as well as an environmental scan;
- Key informant interviews with program representatives, selection committee members and chairholders not participating in the case study (n=8).

While meaningful findings were gathered to address each of the evaluation questions, the process encountered some challenges that required mitigation strategies. The COVID-19 pandemic limited the ability of the evaluation team members to reach all stakeholders and gather in-person information. To mitigate this, data collection proceeded at a distance, using various means. Also, the evaluation covers, in principle, more than 30 years of program activities. While efforts were made to maintain as large a scope as possible, some of the information provided in the report focuses by necessity on the more recent experiences of the chairholders and the results they have achieved. Finally, there is currently no standardized methods among all active chairholders to collect participant data, and the data collected does not systematically include information that would allow for a direct measurement of the program's impact on some underrepresented groups.

Findings

The path to further engaging women in STEM

Gender equality in Canada

As the program has been evolving over the past three decades, so has the broader context surrounding it.

At a higher level, Canada has been implementing a series of measures promoting gender equality, such as the creation of the Status of Women in the 1970s, the adoption of the United Nations' Beijing Declaration and Platform for Action in 1995 (Canada being one of the 189 signatory countries), or the various initiatives on employment equity. More recently, the emphasis placed on applying a gender-based analysis plus (GBA+) lens to policy development and program implementation has provided rich opportunities to better appreciate the challenges and requirements associated with greater gender equity.

NSERC has been actively engaged in supporting this policy agenda. It has prioritized EDI within its own program and activities. As a member of the Tri-

Council of granting agencies, it participates in the Tri-agency Equity, Diversity and Inclusion Action Plan, which focuses on increasing the equitable and inclusive access for all members of the research community to granting agency funding opportunities, as well as influencing the achievement of an inclusive post-secondary research system and culture in Canada (Tri-Agency, 2021).

To pursue its EDI goals, NSERC has also recognized³ the need to implement programs or initiatives that proactively address longstanding barriers limiting the ability of some individuals to pursue research opportunities, with a particular focus on four designated groups: women, Indigenous peoples, persons with disabilities and members of visible minorities. CWSE is one such program, aiming to enhance the participation of women in science and engineering, including women from underrepresented groups.

Where do we currently stand in engaging women in science and engineering?

Things have improved, but more needs to be done.

For one thing, the evaluation indicates that there is greater awareness of the challenges facing women in STEM fields of study. More and more organizations promote STEM and offer a wider range of activities that focus on young girls or female students. There is also greater appreciation for the range of benefits that come from cultivating diverse environments, in both academia and in the workplace (Garcia et al., 2019; Campuzano, 2019). Moreover, efforts to

promote STEM among girls and women in Canada are part of a world-wide movement, as illustrated by the adoption in the United Nations in 2016 of the International Day of Women and Girls in Science.

Despite these efforts, gaps remain. In particular, women remain underrepresented in fields such as computer science, engineering, mathematics and physics (Perrault, 2017). Just as concerning is the fact that women are less likely than men to persist in undergraduate STEM degrees (Wall, 2019).

3. https://www.nserc-crsng.gc.ca/NSERC-CRSNG/EDI-EDI/Action-Plan_Plan-dAction_eng.asp

Figure 1 offers an informative illustration of the trends in women completing their studies in STEM. In 2016, 34% of Canadians holding a bachelor's degree in STEM were women. However, looking more closely at the distribution among age groups, the data indicates that 22% of Canadians aged 65 and older who were holding a bachelor degree in STEM were women, 37% of Canadians in their 40s who were holding a bachelor degree in STEM were women, and 36% of Canadians in their 30s who were

holding a bachelor degree in STEM were women. This points to a certain improvement over time in achieving a greater representation of women in STEM studies, but also to a certain plateauing in more recent times. In fact, administrative data from Canadian universities and colleges indicate that the proportion of students enrolled in STEM studies who are women has remained largely unchanged between 2010 and 2015 (Statistics Canada, 2017).

Figure 1 : Proportion of bachelor's degree holders in STEM. Snapshot as of 2016.



Holders in their 30s
 36% are women



Holders in their 40s
 37% are women



Holders 65+
 22% are women

As one could expect, these trends also reach faculty positions. In 2016, between 16% and 26% of the full-time faculty positions in STEM fields were held by women (Universities Canada, 2019). The same holds for the workplace: women with STEM degrees are less likely than men to work in science and technology occupations (Wall et al., 2018). For instance, 23% of science and technology workers in Canada are women.



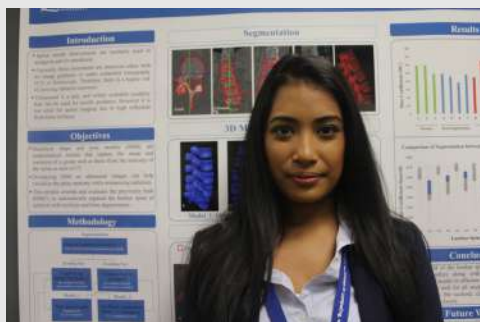
Systemic barriers, often rooted in patriarchal values, have therefore limited women's ability to engage in STEM fields, and the literature has documented some of the resulting outcomes (Wall, 2019; Brainard et al., 1998):

- Compared to men, women have had less opportunities to self-identify with math and sciences, and data indicate that even women who report strong self-identification with math and sciences have been less likely to intend to pursue a major in those fields;
- Lack of inclusivity and cultural bias have contributed to a feeling of isolation and exclusion, which have led some women initially involved in STEM to shift their fields of study;
- As a result of the current culture in some fields of STEM studies, women in STEM tend to have lower academic self-confidence than men of equal academic ability.

Why further engaging women in science and engineering?

The advantages of further engaging women in science and engineering are multifaceted. For women themselves, engaging in science and engineering is providing access to career opportunities that are among the highest-paying and fastest-growing ones (Statistics Canada, 2018a and 2018b). Some of the major global issues are also expected to impact women more predominantly, and women have therefore a vital role to play in achieving sustainable development (United Nations, 2015).

Canada as a whole will gain from achieving greater representation of women in STEM. There is a need to grow the labour force in science and engineering fields, and women represent a partially untapped talent pool that can contribute to addressing this challenge. It is also well established that greater diversity strengthens innovation and performance in the workplace (Phillips, 2014).

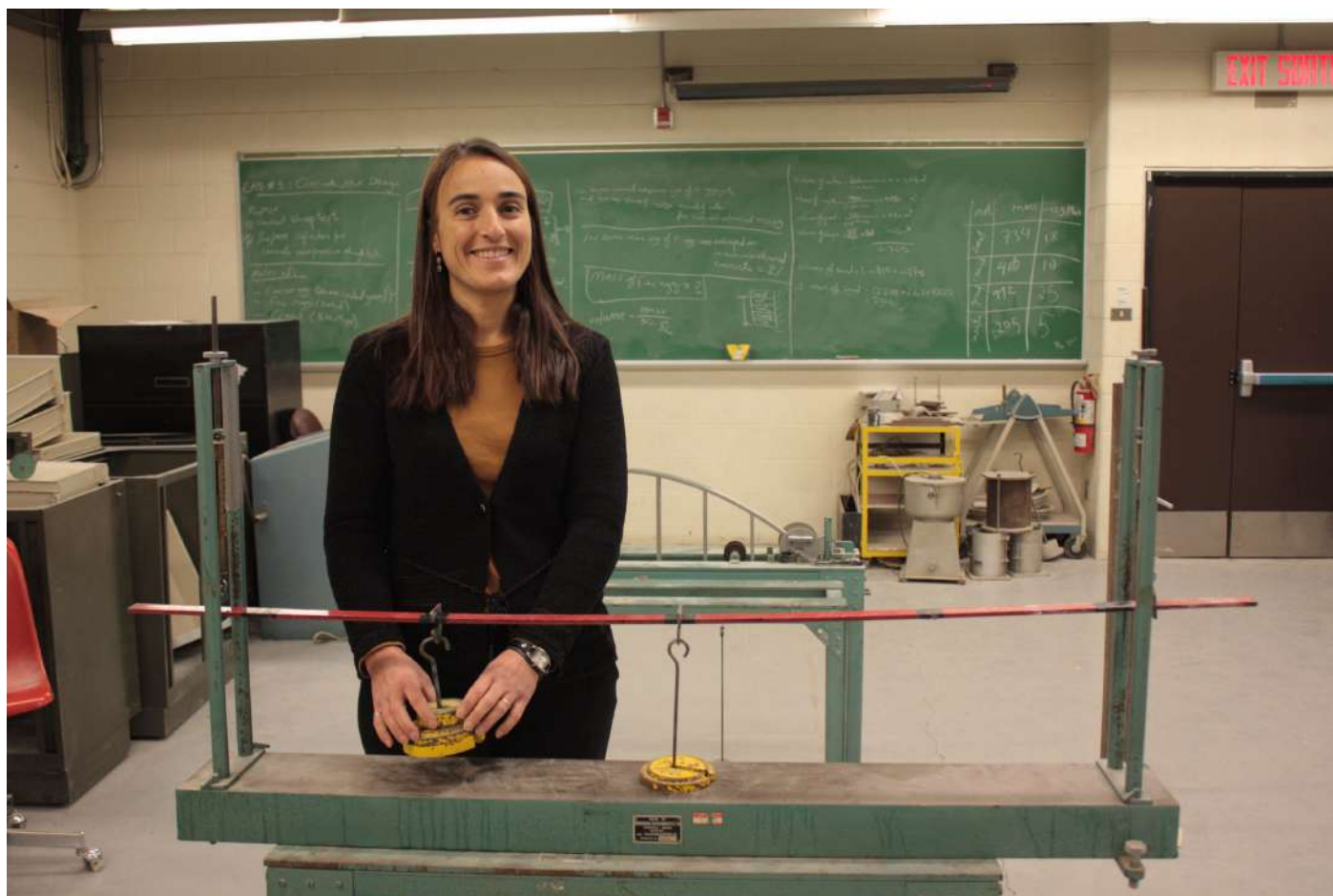


Other related initiatives

All levels of governments, as well as the not-for-profit and private sectors, are actively involved in various forms of STEM promotion. While government-funded programs and initiatives tend to focus on the advancement of women in STEM education and careers within higher education institutions, not-for-profit and private initiatives typically focus on providing role models for women and girls, or engaging participants in hands-on and interactive science learning activities. In all cases, there are both initiatives engaging girls and women, and initiatives engaging youth in general, or certain underrepresented groups, such as Indigenous youth, or youth from visible minority communities.

Within NSERC itself, the PromoScience program offers financial support for organizations working with young Canadians to promote STEM fields, with a particular focus on reaching girls, young women and other underrepresented groups (NSERC, 2021). The Junior Astronauts program offered by the Canadian Space Agency is another example of a federal initiative exposing young Canadians to a wide range of scientific fields (Canadian Space Agency, 2021).

The evaluation confirms that, within this fairly vast eco-system of STEM promotion, the CWES occupies a unique niche. There is simply no other program that provides an opportunity for women who demonstrate leadership in their academic fields to be given the opportunity to set half of their time aside to engage students in STEM-related activities, to promote STEM, and to explore the barriers to greater participation of women in STEM.



What is the contribution of the CWSE program?

Who has received support from CWSE?

Arguably, understanding the impact of the CWSE program first requires some knowledge of the 18 women who have thus far held a CSWE Chair. Evaluation findings indicate that while they all come with their very own personal story and their distinct fields of expertise, they share a profound and long-standing commitment to achieving greater equity in women's participation in science and engineering.

Interestingly, a significant proportion of chairholders were born outside of Canada, or born from first-generation immigrants to Canada. They or their family typically come from countries where conditions are seen as more equitable for women in science and engineering, a fact confirmed by the most recent statistics from the UNESCO Institute for Statistics (2019). During interviews, most chairholders confirmed that, until they entered

academia, they had limited awareness of the inequities that women in science and engineering were facing. As their understanding of these challenges grew, they explored ways that they could themselves contribute to addressing this challenge, and the CWSE program was seen as particularly relevant in that regard.

Various factors have led CWSE chairholders to apply to the program. During interviews, some chairholders noted that they knew about the program, but were initially not certain that this was an appropriate fit, or that it was a timely decision in terms of their academic path. Learning more about the program, meeting an existing chairholder, or being encouraged by colleagues or senior managers within their faculty were some of the factors that have led chairholders to submit an application.

Focus and priorities of the Chairs

The evaluation indicates that chairholders have targeted their efforts to address the following challenges:

- Understanding why fewer women enter and persist in STEM;
- Increasing the representation of women in STEM at all levels, by acting on the various factors contributing to an underrepresentation of girls in STEM fields;
- Recruiting women into STEM by making this field more engaging for girls, and by dispelling gender stereotypes;
- Improving the workplace culture and enhancing women's wellbeing;

- Ensuring that women in STEM equitably progress in their careers;
- Building regional networks by connecting existing organizations and institutions working on promoting women in STEM.

In doing so, evaluation findings indicate that chairholders have tended to engage girls in grades K to 12, university students, and academics. There have been fewer activities targeting women who are acting as science and engineering professionals in the industry.

Strategies implemented to date

To address these challenges, the chairholders have implemented a wide range of strategies and activities. For the purpose of this report, a sample of activities undertaken by the chairholders is included to illustrate their actual work with each of the key stakeholder groups.

Strategies aimed at girls K-12

- Undertook outreach activities, such as summer camps, workshops, and competitions or challenges;
- Introduced students to role models in STEM;
- Provided mentorship opportunities and supervising projects;
- Identified STEM resources for youth;
- Provided materials that can assist parents in cultivating an interest for STEM fields among their children;
- Hosted outreach activities for Indigenous youth.

Strategies aimed at educators

- Developed pedagogical tools to facilitate the teaching of STEM;
- Worked with school boards, teachers, and education ministries to enhance how science and engineering are taught, and address biased perceptions about women in STEM.

Strategies aimed at women university students

- Hosted and participated in panels, workshops, and seminars for students;
- Provided mentorship opportunities;
- Offered research opportunities that are supervised by female professors;
- Provided bursaries and scholarships;
- Explored strategies to enhance science and engineering pedagogy in academia;
- Offered programs for science and engineering students to collaborate with Indigenous communities and to engage Indigenous youth in science and engineering.

Strategies aimed at science and engineering faculty and academic administrators

- Organized professional development workshops;
- Hosted peer networking events;
- Offered one-on-one support for women holding faculty positions in science and engineering;
- Offered workshops for administrators on recruiting and retaining women, and on EDI;
- Undertook workplace climate surveys.

Strategies aimed at science and engineering professionals in the industry

- Hosted professional development workshops and networking events;
- Delivered or participated in presentations, panels, workshops, and training to industry leaders on recruiting and retaining women, and on EDI;
- Hosted sessions on gender diversity to business leaders;
- Assessed professional associations' policies and award criteria;
- Participated on boards, councils, and advisory committees.

Strategies aimed at connecting organizations and individuals that support girls and women in science and engineering

- Organized and participated in regional, national, and international conferences;
- Offered networking programs that connect regional university-based and not-for-profit organizations supporting girls and women in STEM.

Strategies aimed at the general public

- Published CWSE Chair newsletters, bulletins, social media communications, and websites;
- Participated in panel presentations, invited talks, and interviews with journalists.

Contributions to government work through reports, conferences and consultation

- Participated in feature stories of science and engineering role models (through videos and booklets);
- Made resources pertaining to women in science and engineering more accessible to the public;
- Conducted research studies on a wide range of relevant research subjects, often in collaboration from academics in other disciplines;
- Participated in national and international events.

It should also be noted that an earlier Chair also contributed to the creation of the *Association de la francophonie à propos des femmes en sciences, technologies, ingénierie et mathématiques*, and the International Network of Women Engineers and Scientists, which remain vibrant organizations allowing women in science and engineering to engage in broad supporting networks.

Partnerships

Developing partnerships is at the core of the work undertaken by chairholders. These partnerships involve each Chair's home university, industry partners, professional STEM associations, provincial and federal ministries and departments, other academic and research institutes, and a wide range of non-profit organizations involved in STEM.

Evaluation findings indicate that these partnerships are invaluable in allowing chairholders to successfully implement their strategies and action plans. These partners may provide matching funds and in-kind donations, engage in research or outreach activities, or help find other partners or sponsors. However, depending on the specific field that a chairholder focuses on, it was noted that finding industry partners may be challenging at times.



The CWSE National Network

In 2006, the CWSE National Network, which facilitates collaborations among the sitting Chairs, was financially supported by NSERC and receives \$80,000 per year. One chairholder is appointed by the other members to act as the Principal Investigator and is responsible for the management of the network funds and the production of annual reports on network activities for NSERC. Also, a strategy for the National Network is developed every year by the chairholders.

Evaluation findings indicate that the National Network has become an important asset of the program. It creates a community of practice for the chairholders, who are able to come together as individuals who share the same goals of enhancing the engagement of women in science and engineering. As noted during interviews, this sense of community helps to reduce the feeling of isolation

and loneliness that a chairholder may experience at times. It allows chairholders to share tips and tricks on finding partners or securing matching funds, in addition to providing opportunities for the chairholders to learn about activities undertaken in other regions.

The National Network also allows activities to be shared and re-used among regions, extending their reach across other regions, without needing to duplicate the efforts in developing them. And perhaps more importantly, the National Network helps pass on institutional knowledge from Chair to Chair and maintain the program's continuity.

The one challenge noted by chairholders in relation to the National Network is for the chairholders to actually carve sufficient time aside to fully engage in the various opportunities that it provides.

Impact of CWSE

The evaluation process provided an opportunity to document the work undertaken by the chairholders, and some of the impacts that this work has had. However, the evaluation also confirmed that measuring the overall impact of CWSE remains challenging. The chairholders are currently exploring strategies to enhance the measurement of the program's impact, and evaluation findings confirm the relevance of such efforts, which will directly support future evaluations of the program.

Impact on participants

Despite these limitations, evaluation findings confirm that the program has brought visibility, prestige and credibility to the various initiatives that chairholders have put forward. Holding an NSERC Chair that specifically and formally recognizes the efforts undertaken by a leading woman in science and engineering opens a wide range of opportunities that would otherwise not be available, despite the individual's best intentions. It not only validates the relevance of the work undertaken by the Chair to promote science and engineering, but more practically, it makes it possible by freeing sufficient time for her to engage in these activities.

Evaluation findings also provided evidence of the impact that individual Chairs have had:

- Through feedback forms, participating students have documented how the activities undertaken have increased their interest in science and engineering, and their desire to further explore these fields. In some cases, participating students have indicated that the activities they engaged in motivated them to pursue graduate studies in science and engineering.
- Teachers have also confirmed how the activities provided by the chairholders have facilitated their efforts to teach science and engineering and engage students. In one region, the Chair has contributed to the development of a university course on how to teach science and engineering.
- Some academic administrators have indicated that the work of the chairholders have facilitated the development of new policies to promote the recruitment and retention of women in faculty positions, and their engagement in leadership positions.

Impact on the chairholders

The program also has a lasting impact on the chairholders themselves. During interviews, they have described their experience as being profoundly rewarding and transformative, but also challenging. Balancing the significant amount of work required by the Chair with all their other professional and personal responsibilities has been difficult at times. Despite these challenges, the chairholders have indicated that engaging in all these various outreach and promotion activities has broadened their competencies, and have allowed them to develop new collaborations and partnerships. Some chairholders have noted that the program has, in fact, helped advance their career and move into leadership positions.

During interviews, some chairholders noted that their academic productivity declined somewhat in the early days of their Chair's tenure, largely as a result of the various outreach and awareness activities in which they were involved. Focussing at least half of their time on CWSE related activities required adjustments to the implementation of their actual research program. Having access to a postdoctoral fellow or a research engineer has been particularly important to mitigate this impact. Also, chairholders noted that their academic productivity was ultimately boosted through the various opportunities brought by the program, including the new partnerships formed as a result of being a CWSE chairholder.

How to improve CWSE

Chairholders were asked about potential areas of improvement for the program. In addressing this question, they first emphasized what they particularly value about the current program delivery, which includes the following dimensions:

- Having devoted time for the Chair through a reduced teaching workload and deferred Discovery grant renewal as required, as well as the provision of funds for a graduate student or a postdoctoral researcher;
- The critical and ongoing support provided by staff members from NSERC;
- The support provided by the National Network;
- The opportunities to engage in multidisciplinary collaborations;
- The flexibility provided by the program that allows each Chair to develop a strategy that reflects her vision and the context and environment in which she operates.

On that basis, the chairholders identified areas that could further improve the impact of the program, which led to the following suggestions:

- Defining more precisely the guidelines for preparing the required activity reports;
- Addressing some concerns relating to the current process used to review applications for individual Chair and the National Network, including more information about the CWSE selection committee, and ensuring that the feedback provided is clearer and more realistic considering the parameters of the program.
- Providing additional guidelines on how each Chair can target subareas of the objectives identified by the program;
- Facilitating the transition between regional Chairs and facilitate the sustainability of the initiatives undertaken in a region, which could include: introducing an overlapping period between the outgoing and incoming Chair, establishing Associate Chairs at other universities in the region who become well positioned to apply for the Chair's position, and creating an archive of past chairholders' initiatives;
- Providing guidance on implementing intersectionality to the development and implementation of the Chair's strategies and action plans.

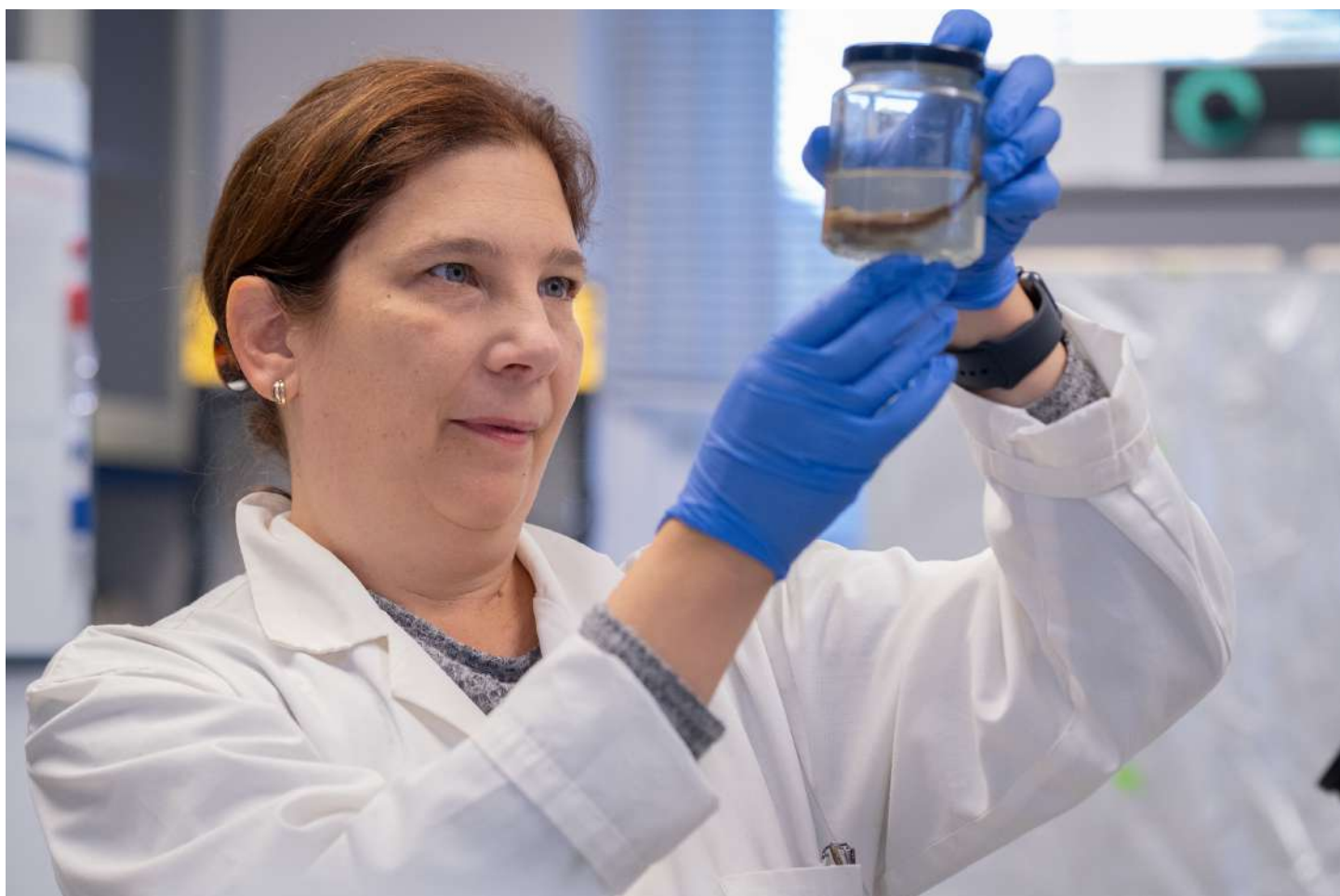


Conclusions and recommendations

Considering the findings gathered as part of the evaluation of the CWSE program, the following conclusions and recommendations are made:

Recommendation 1 : NSERC should maintain the CWSE program.

The evaluation confirms that the CWSE program occupies an important niche within the wide eco-system of programs and initiatives that promote the engagement of women in science and engineering. The chairholders who are supported by the program undertake a set of activities tailored to their specific areas of scientific research and their regional and institutional environments. They collaborate with other stakeholders, sharing the goal of meaningfully engaging women in science and engineering. The program also serves to communicate NSERC's vision and commitment related to equity, diversity, and inclusion in the fields of natural sciences and engineering.



Recommendation 2 : In collaboration with the current Chairholders and other relevant stakeholders, NSERC should review the current set of program objectives to ensure that they more closely reflect the range of activities undertaken by the chairholders and the contribution that the program can be reasonably expected to achieve.

The current set of program objectives adequately reflects the challenges faced in Canada in engaging women in science and engineering, and the range of outcomes that all stakeholders in this field aspire to achieve. As such, these objectives reflect the broader context in which the CWSE program is operating.

On that basis, it is recommended that a set of objectives that more closely align with the precise contribution that the program, and each Chair by extension, may be expected to achieve be developed. Defining objectives that better describe the relative contribution of the program within the larger set of initiatives promoting women in science and engineering in Canada offers tangible benefits. It will serve to better communicate expectations to those considering applying to become a chairholder or the newly appointed chairholders. It will also support efforts to adequately position and promote the program in the broader ecosystem of women in science and engineering initiatives. Finally, it will allow the program to refine its performance measurement activities, including considerations associated with equity, diversity, and inclusion within the program itself, to ensure that no systemic barriers may limit the access by the targeted clientele to the expected benefits of the program.

Recommendation 3 : NSERC should review the process related to the transition between chairholders in each region to include sufficient overlap for knowledge sharing and continuity.

Evaluation findings leave no doubt as to the profound engagement of each Chair in promoting science and engineering among Canadian women. The experience of being Chair has been described as demanding, rewarding, and transformative. To make the most of these efforts, it is critical to ensure an efficient transition between chairholders in each region, so that the knowledge acquired can be shared and that continuity can be achieved, as applicable.



References

- Brainard, S. G., & Carlin, L. (1998). A six-year longitudinal study of undergraduate women in engineering and science. *Journal of Engineering Education*, 87(4), 369-375.
- Campuzano, M. V. (2019), "Force and Inertia: A Systematic Review of Women's Leadership in Male-Dominated Organizational Cultures in the United States," *Human Resource Development Review*.
- Canadian Space Agency. (2019, February 28). Junior Astronauts. Canadian Space Agency. <https://www.asc-csa.gc.ca/eng/youth-educators/junior-astronauts/default.asp>
- García Johnson, C. P. and Otto, K. (2019), "Better Together: A Model for Women and LGBTQ Equality in the Workplace," *Frontiers in Psychology*, vol. 10, no. 272.
- Natural Sciences and Engineering Research Council of Canada. (2016, June 28). About the PromoScience Program. Natural Sciences and Engineering Research Council of Canada (NSERC). http://www.nserc-crsng.gc.ca/promoter-promotion/promoscience-promoscience/about-apropos_eng.asp
- Natural Sciences and Engineering Research Council of Canada. (2016, June 28). Chairs for Women in Science and Engineering program. Natural Sciences and Engineering Research Council of Canada (NSERC). http://www.nserc-crsng.gc.ca/Professors-Professeurs/CFS-PCP/CWSE-CFSG_eng.asp
- Natural Sciences and Engineering Research Council of Canada. (2019, September 24). Tri-Agency EDI Action Plan for 2018–2025. Natural Sciences and Engineering Research Council of Canada (NSERC). https://www.nserc-crsng.gc.ca/NSERC-CRSNG/EDI-EDI/Action-Plan_Plan-dAction_eng.asp
- Perrault, A. (2017). Analysis of the distribution of gender in stem fields in Canada. Technical report. Retrieved from http://wiseatlantic.ca/wp-content/uploads/2018/03/WISEReport2017_final.pdf
- Phillips, K. W. (2014). How diversity makes us smarter. *Scientific American*, 311(4), 43-47.
- Statistics Canada (2017, December 07). Canadian Postsecondary Enrolments and Graduates, 2015/2016. Retrieved from: <https://www150.statcan.gc.ca/n1/daily-quotidien/171207/dq171207c-eng.htm>
- Statistics Canada. (2018a). Data tables, 2016 census (Table 14-10-0297-01). Retrieved from <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410029701>
- Statistics Canada. (2018b). Data tables, 2016 census (Table 98-400-X2016281). Retrieved from <https://www150.statcan.gc.ca/n1/en/catalogue/98-400-X>
- United Nations. (2015). Resolution adopted by the General Assembly on 22 December 2015. A/RES/70/212, 17 February 2016. Retrieved from <http://undocs.org/A/RES/70/212>
- Universities Canada. (2019). Equity, diversity and inclusion at Canadian universities: Report on the 2019 national survey.

Wall, K. (2019). Persistence and Representation of Women in STEM Programs. Insights on Canadian Society. Statistics Canada.

Wall, K., Zhao, J., Ferguson, S. J., & Rodriguez, C. (2018). Results from the 2016 Census: Is Field of Study a Factor in the Payoff of a Graduate Degree? Insights on Canadian Society. Statistics Canada.

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