



HOUSE OF COMMONS  
CHAMBRE DES COMMUNES  
CANADA

## **Standing Committee on the Status of Women**

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FEWO



NUMBER 054



2nd SESSION



41st PARLIAMENT

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**EVIDENCE**

**Tuesday, April 21, 2015**



**Chair**

**Ms. Hélène LeBlanc**



## Standing Committee on the Status of Women

Tuesday, April 21, 2015

• (1100)

[Translation]

**The Chair (Ms. Hélène LeBlanc (LaSalle—Émard, NDP)):** Good afternoon, and welcome back.

I like to be punctual, out of respect for our guests and everyone else. I call the meeting to order.

I want to welcome you to the 54<sup>th</sup> meeting of the Standing Committee on the Status of Women. We are continuing our study on women in skilled trades and science, technology, engineering and mathematics occupations.

Today we welcome some very interesting witnesses, Ms. Bonnie Schmidt, president of Let's Talk Science; Ms. Dorothy Byers, member of the Board of Directors of FIRST Robotics Canada, and Head of School, St. Mildred's-Lightbourn School, as well as Ms. Karen Low, member, Board of Directors. We also welcome Ms. Saira Muzaffar from TechGirls Canada.

Each group will have 10 minutes to make their presentation. Afterwards, members of the committee will ask questions.

We will begin with the group Let's Talk Science.

Ms. Schmidt, you have 10 minutes.

[English]

**Dr. Bonnie Schmidt (President, Let's Talk Science):** Thank you very much for inviting me to address the committee about developing STEM talent. As the founding president of Let's Talk Science, I personally have spent the past two decades working to ensure that Canadian youth are prepared to thrive in this country, enjoy a high quality of life, and contribute as engaged citizens.

Let's Talk Science, or Parlons sciences, is a national charitable education and outreach organization that helps youth prepare for their future careers and their citizenship role through STEM engagement. I won't describe our programs in detail here, but I can deal with them during questions, if you like. Our programs support preschool through to grade 12 youth and educators. Our primary goal is to keep young people engaged in the STEM fields to the end of high school. We believe this will enable them to keep as many doors open as possible to all post-secondary pathways, including college, university, and apprenticeships.

We've reached well over 3.5 million children, youth, and educators since our inception. We annually work with about 4,000 volunteers, the majority of whom are post-secondary students in STEM disciplines. It may be of interest to the committee that over 60% of our volunteer base annually are women in STEM.

Let's Talk Science creates world-class learning resources. We connect youth with STEM volunteers, and we conduct research into our own impact as well as some of the systems-level research. It's that research that I'd really like to share with the committee here.

With that context, I'd like to share three key observations for your report. The first one is that definitions are very critical. The lack of clearly articulated visions, goals, desired outcomes, and measurement systems in place now results in a misalignment of effort and missed efficiencies. STEM is a global acronym that has little resonance with most people. While we understand that it refers to science, technology, engineering, and math, most people don't. In fact I recently asked a large group of high school students what they thought STEM was, and they thought I was going to talk to them about stem cell research.

When it comes to measuring STEM workforce issues, there is also no standard definition for what constitutes a STEM job. Research and engineering-type jobs consistently make the list of STEM occupations, but there is less agreement about whether to include such other occupations as educators, managers, technicians, and health care professionals. Let's Talk Science supports a broad definition of STEM occupations. In fact, until we have real clarity and standardization about what falls into these categories, we'll continue to question whether our engagement efforts are actually succeeding, because we're all measuring different things.

My second observation is that considerable progress has been realized, but gender differences in STEM participation continue, as this committee well knows. During my tenure at Let's Talk Science, which is actually pushing 24 years now, we've seen girls close the gap on achievement on national and international science tests, clearly demonstrating that capacity isn't the challenge. Female participation at university has overtaken male participation. Women now exceed men in life sciences and environmental sciences, and men exceed women in physical sciences and engineering disciplines, there again underscoring the importance of defining very clearly what you're talking about with STEM. Unfortunately, over those two decades little has changed regarding participation rates of women in such STEM-heavy skilled trades as welding, or in engineering technologies.

With one of our partners, Amgen Canada, Let's Talk Science has been looking at the implications of STEM learning at a macro level. We've produced several reports, one of which I've shared with the committee, called "Spotlight on Science Learning". The reports can be accessed through the Let's Talk Science website. A copy of this most recent report was included in our submission, so all committee members should have access to it in French and English.

The study is called “Shaping Tomorrow's Workforce: What Do Canada's Teens Think About Their Futures?” We surveyed teenagers aged 13 to 17 years to understand their perceptions and interests in broadly defined STEM work. I'd like to share a few of the findings from the report.

**A hon. member:** We don't have it.

**Dr. Bonnie Schmidt:** You'll get it, then, because it was sent.

• (1105)

**The Chair:** We have a few copies, but we don't have copies for all the members.

**Dr. Bonnie Schmidt:** I will make sure to send them.

**The Chair:** The link was distributed to them.

**Dr. Bonnie Schmidt:** Perfect, so I'll give you a few of the highlights. You don't need to be reading through the report right now. It will be sent to the clerk for sure.

We found that overall 88% of teen girls and 79% of teen boys felt that women could find great satisfaction in a STEM-related career. It's clearly a positive finding, but it's perhaps a little surprising to see a nine-point spread between boys' and girls' impressions.

Several of our findings showed no gender differences. For example, the vast majority of boys and girls want to make a useful contribution to society, help people, make decisions, and solve problems. Furthermore, both boys and girls are more likely to make post-secondary decisions based on their personal likes and interests and their perceived skills and abilities.

A few areas did result in significant gender differences. I want to highlight those.

For example, teen girls reported to be significantly more likely than boys to want to use communication skills, have a professional job, be responsible for other people, work with animals, care for sick people, and work in a laboratory. Girls are significantly less likely than boys to report they want to work with their hands, although I would say that 60% reported that they were quite interested in working with their hands. They are also significantly less likely than boys to want to create new products, use math or calculate things, and design things like buildings, bridges, and cars—which is a dire concern if we want more engineers—and work with machinery.

From these results and others that are discussed in our report, it appears that we're working from a position of strength and that Canadian teens want fulfilling work that allows them to make useful contributions and play leadership roles, but we need to do a better job of helping them understand how STEM-based work can fulfill these personal motivations.

Understanding the factors that influence girls' thinking and when those factors come into play also helps us to design programs and interventions that will lead to positive outcomes. I know that some of my fellow panellists here will actually share some of their best practices in this case. In some cases, while this is perhaps not very scientific, I suspect that a simple lack of experience or exposure is leading to negative perceptions that can be long-lasting.

My third observation is that, while it's outside my personal area of expertise, I know that quite a bit of research has been done on assessing barriers that face adult women in the STEM workforce. Within my sector, a considerable amount is known about the barriers to youth STEM engagement, and a significant challenge has been not to continue to look at the factors but to figure out how to scale effective practices.

Indeed, considerable global research has been done over the past decade to identify barriers, as many countries are dealing with trends similar to Canada's with respect to youth participation and in particular girls' participation in STEM. In general for the barriers, I'd bucket them into three big areas. One is a lack of perceived relevance, including a lack of perception of career awareness and what is waiting for them down the road if they stay in STEM. Also, the negative stereotypes are deeply persistent, and a lack of role models is part of the negative stereotypes.

The third big area is school-based issues. There are too few subject areas and too few subject experts teaching STEM. There's a lack of equipment and there's a lack of resources to do experiential learning in schools. The curriculum in every province continues to grow and expand without losing things. In fact, the greatest challenge might even be that science and technology lack priority across the country. No jurisdiction requires students to complete a technology or shop course during high school, and no province requires grade 12 science for graduation, so that's a problem.

Let's Talk Science has focused our programs on addressing the known barriers. From toddlers to teens, we are reaching about 600,000 kids a year, plus teachers, and from our program-based evaluations we see positive results related to skill and attitude development. A lack of sustained financial support makes research on the long-term impact prohibitive, but we're pretty sure we're on the right track.

At a systems level, we've also seen the impact that focused resource allocation can have. For example, Let's Talk Science has enjoyed a significant partnership with Hibernia in Newfoundland and Labrador over the past two and a half years. With their support, we've been able to grow our annual reach in that province to well over 65% of the province's schools, including the schools in Labrador, and establish a strong working relationship with the Department of Education.

In Ontario, FedDev's youth STEM initiative invested about \$20 million over three years in the youth engagement sector. In the same time period, we saw a steady increase in the rate of applications to Ontario university STEM programs. Unfortunately, the FedDev youth program sunsetted last year, but we were quite happy to see that the 2014 federal science, technology, and innovation strategy referenced a significant increase in funding through NSERC to support youth STEM engagement.

• (1110)

Based on my observations, I have three quick recommendations for the committee.

First, in your report please do define “STEM” and “STEM-based” work clearly and broadly. I also encourage you to develop a bold vision and clearly defined outcomes that can help us align and leverage stakeholder efforts.

Second, please endorse the funding support that's referenced in the recent federal science, technology, and innovation strategy towards effective youth STEM practices. It has the potential to really energize the sector and leverage it in a significant way.

Third, recognize that balancing gender participation rates in STEM to maximize the benefits is complex and in part a cultural issue that will take some time to change. Significant advances have been made, but clearly more can be done.

In conclusion, this is a very important issue, as the highest-demand jobs in a creative, knowledge-based economy require people with the skills and knowledge that are developed by STEM learning. Many jobs that have been traditionally perceived to require lower-level skills have been transformed and also require STEM. All jobs benefit from people who are analytical and curious—the very qualities that drive innovation and that are developed through STEM engagement.

In my opinion, all young people need to have more opportunities to be engaged in STEM. We need to start early and we need a strong national effort that's focused and measured. If we don't, Canada will slip behind, as other countries are focusing on the issue and investing. Some of the other research that we've done has been looking at China.

While your report is focused on women, I just want to leave you with the final message that the cultural shifts that are happening are including both genders. There's no simple solution to solve the talent development challenge. It will take a long-term, sustained impact. We have seen considerable movement over the last 20 years. With your leadership and guidance, I think we can continue to achieve great things in the next decade.

Thank you.

[Translation]

**The Chair:** I now give the floor to the representative of FIRST Robotics Canada.

You have 10 minutes.

[English]

**Ms. Dorothy Byers (Head of School, St. Mildred's-Lightbourn School, and Member, Board of Directors, FIRST Robotics Canada):** Karen and I are absolutely delighted to be here today and to be able to share some of the best practices we have seen through FIRST Robotics Canada and the impact that it has.

I'd just like to tell you that I am the head of school for a girls' school that has been involved in robotics for 13 years with great success. Our girls right now are on a bus on the way down to St. Louis for the world championships.

**Voices:** Hear, hear!

**Ms. Dorothy Byers:** I will be very happy to share a little bit more detail about the tremendous impact it's had, not only on them but on

the culture they see in this, as Bonnie has said, very male-dominated world.

**Ms. Karen Low (Member, Board of Directors, FIRST Robotics Canada):** FIRST Robotics was founded by Dean Kamen. If you think of the Segway in the U.S., he was the founder of the Segway. He also did the insulin pump so that people could wear it on a belt, instead of having to take injections throughout the day, and the biomechanical arm. Perhaps one of his most far-reaching notions was the fact that he wanted scientists to be the 21st century's superstars. Basically, he wanted FIRST Robotics to be like the Olympics to an athlete. FIRST Robotics would be the same type of event for somebody involved in math and science.

In 2002, FIRST began in Canada. Mark Breadner, a teacher at Woburn Collegiate, had the notion to bring the same type of program to Canada.

• (1115)

**Ms. Dorothy Byers:** FIRST is a very lean organization and we just wanted to highlight that for you. Everyone who is involved in FIRST is a volunteer. Karen and I have been involved as volunteers for a very long time.

What happens, though, when we begin, looking at what the pieces are that really surround FIRST Robotics and what makes it unique, is that it starts in junior kindergarten and goes all the way to grade 12. As you see on the screen, Junior FIRST LEGO League is really from kindergarten up until grade 3. Then FIRST LEGO League picks up and works to grade 8. At that point, students are engaged in another program, called FIRST Robotics. That's where they build the big robot that weighs about 120 pounds. Those are really incredible machines.

But what is so wonderful about it, as you will see in the statistics, is that in 2002 FIRST started with 26 Canadian teams. Two of those were all-girl. Sadly, one of the all-girl teams faded. Our girls' team continued. Now we're looking at 4,300 direct participants, with an annual growth rate of about 30%.

Essentially what we're seeing is that if you pour some water on it, it will continue to grow. We had to begin the junior programs because there was such demand for it.

**Ms. Karen Low:** As Bonnie mentioned earlier, there is a big need to have experiential learning. That's what these programs really give our students. Hands-on, they can make it or break it, and there's no fear that they'll have any negatives. They're always going to be learning.

FIRST Robotics Canada needed funding. Take a look at some of the sponsors. We have a number of companies that decided that not only did they too want to invest in the students, but this also was a way for them to get their mentors working with the new people, with what they're thinking, and to be right on that cutting edge of technology.

**Ms. Dorothy Byers:** Over the years, as you can see shown on the screen, we have been very appreciative of the federal government's financial support, which has really enabled FIRST to grow in Canada. From 2011 to 2014, we were very happy to have \$1.5 million spanning those three years. The Ontario Ministry of Education also supported the program with \$3 million over five years. That saw real growth in the first program, doubling the number of teams, first of all, and students and competitions. There was an incredible impact from the water that was poured on the program. It really did grow.

What you can see as well is that between 2011 and 2014 there was remarkable success in all-girls teams. We're very proud of that, because we grew from two to ten, and that was through the tremendous support of one of our large banks in Canada that really believed it was important to have an incubator program for girls who were interested in STEM but were feeling a little uncomfortable about joining boys' teams or coed teams in their schools. We are very proud of that. Most of those are in Ontario. There are a number of them. There are two girls' teams in Alberta. Our team at St. Mildred's has really been the spawner of seven of those teams, so we're very proud of that work.

You can see as well that in 2013, after tremendous success, two FRC teams met with Prime Minister Harper.

**Ms. Karen Low:** STEM programs through FIRST Robotics also include outreach to targeted groups, including not only women but first nations communities, visually impaired and hearing-impaired students, and at-risk students. We also spend much of our resources to reach out to those in underserved areas or under-resourced areas where perhaps the school district doesn't have the money to go ahead and institute one of these programs.

We do a lot of network building, our students with our mentors and our students with our teachers. It's amazing that even though they're in the same school every day with the same teachers, robotics brings them together and really is a new fabric in the school. We feel that this is developing our next generation of STEM leaders, and we know that because we've been around long enough now such that a lot of these students have now graduated from university and are coming back or serving in those university communities as STEM leaders.

We're seeing a transformation of what was science and technology and engineering into what's really a popular sport. I wish I had had that choice years ago as well, but we are empowering women to make courageous post-secondary and career choices. Sometimes in these teams it's the first time they've learned that they're making decisions based on critical analysis and thinking. It's no longer about voting for the most popular beauty queen or who's going to be in charge of your football team. It's based on scientific information and they now realize they have a very strong voice at the table.

• (1120)

**Ms. Dorothy Byers:** At the same time, as the girls are working in their teams, they are also using what they're doing in their classrooms. One of my favourite stories is about girls struggling with trigonometry working ahead of a team meeting. They went off to look at the ramp the robot had to roll up. They looked at each other after figuring out what the angle was and said, "We're using

trig." It really gave them a hands-on, real-world experience to take what they were learning in their classrooms and transfer it into a real-world learning opportunity. You have no idea of the confidence that will give young women.

There's another piece we're seeing when we look at the numbers. Our teams with the younger students tend to be made up of boys and girls fifty-fifty. Sadly, as they get older, that number drops across the country. I'm very happy to report that our statistics are better than those in the United States. We're seeing about 35% to 65% of girls carrying on. In the U.S., it's about 72% boys and the other smaller percentage is girls, so we're doing something right up here.

The other thing that's really exciting about STEM is that the girls who are involved in FIRST Robotics have a hands-on experience with it that they really take forward. As we look at our graduation rates—and I surveyed the other girls' teams—we see that about 87% to 90% of the girls who have been involved in a FIRST Robotics program go on to study the hard-core STEM subjects at university, so we know it's working. The other tremendously powerful thing in this is that through these clubs and teams they have met with women who are mentors and who are practising engineers, and they really have a tremendous network and resource.

The other thing that I believe this does for us is that it's shifting a change in opinions of boys and men around what it is that girls are able to do. They are seen as equal partners on teams when, as Karen said, they're an equal voice at the table. The boys look at them differently and understand that they really do have an excellent grasp of what science, math, engineering, and technology are, and they can do anything with that.

**Ms. Karen Low:** The Ford Foundation in the United States commissioned a study by Brandeis University, and they looked at two groups. One was FIRST students and one was another group of students with similar backgrounds and achievement in high school. They took a look at four metrics: those attending college, aspiring to post-graduate degrees, majoring in science and engineering, and majoring specifically in engineering. As you can see, the students who had the chance to build that confidence in FIRST Robotics fared much higher on all four of those metrics.

**Ms. Dorothy Byers:** When we look at success for women, it's the growth of interpersonal skills. I guess I'm fortunate in working in an all-girl environment, because we're very aware of the different learning styles that girls have. It's really critical for us to challenge those and to be able to extend any kind of learning style a girl has and take her out of her comfort zone so that she is able to stand on the world stage and in coed teams to be able to support that.

They also learn how to integrate. They have developed tremendous confidence. They get very comfortable where it is uncomfortable to be. They really learn to mentor each other as well. They're learning great mentoring skills from their colleagues. They're very excited to stay on course. As you'll see, they really develop an incredible passion for STEM.

**Ms. Karen Low:** What's been most exciting for us is that our universities want our young women and our young students through FIRST Robotics. In fact, we have over \$26 million in scholarships worldwide, \$150,000 in Canada. You'll see the 10 universities in Canada that are now supporting this program. They've supported not only with money for scholarships but also in kind, with a number of them donating their campuses and venues so that we can have our FIRST Robotics on site. They feel that if a high school person goes on site to a university, they're 70% more inclined to choose that university or college later on, because now they're familiar with it. It's no longer that scary environment. They become comfortable again with the uncomfortable.

• (1125)

We want to mention that Minister Holder has indicated his support of FIRST Robotics. We were also thrilled earlier this year when we had MP Carmichael at Ryerson, MP Perkins at UOIT, MP Braid at Waterloo, MP Aspin in North Bay, and MP Watson in Windsor.

We just wanted to say thank you to each of you for taking your time on a weekend to come out and have that dialogue, one to one, with the students. It was significant for them to meet someone in government being so supportive.

Thank you.

**The Chair:** Thank you very much.

[Translation]

I now give the floor to Ms. Muzaffar.

You have 10 minutes.

[English]

**Ms. Saira Muzaffar (TechGirls Canada):** Thank you, Madam Chair.

I thank the committee for inviting TechGirls Canada to present and to participate in this important study along with the other panel members here. In my statement, I will focus on six key reasons why our efforts to date are failing to achieve equitable change and equal compensation for women in STEM, and how we need to approach solutions going forward.

TGC focuses on building community and driving change by spearheading and amplifying support for women's leadership in STEM fields. Our platform provides national leadership to over 300 organizations working to encourage more women and girls to consider career options in tech fields.

Through numerous documented studies, we know that women's access to roles in leadership positions and their financial compensation in these positions do not competitively or equitably compare to the access and compensation available to men who have similar experience, expertise, and qualifications. This is true for most industry sectors, not just STEM fields, meaning that with all things being equal between two job candidates, one man and one woman, even in the average best-case scenario the woman will make 20% less money than the man and will face more barriers when applying for senior leadership positions than he will.

We in both the private sector and the public sector question why this is still the case at a time when we have the largest number of

educated women and women in the workforce than we have ever had historically. This can be understood if we always remember the following.

One, simple access to education is not a good enough solution to attracting and retaining women in STEM fields. The education itself needs to be considered.

Two, there is no equality without equitability. When industry, institutions, education, and culture, both social and corporate, are designed to benefit the status quo and the privileged group, we cannot achieve equality between men and women without changing how we educate our youth, how we support professional development, how we structure and exercise hiring practices, and how we foster and promote leadership and excellence.

Three, individual merit does not trump and cannot balance the influence of institutional and behavioural barriers. Leaving the onus on the individual to represent themselves and transcend both institutional and social barriers is not a good enough solution and speaks to neither equality nor equitability. We have seen time and again how women in general are chastised for not negotiating better and for not being more assertive. These claims do nothing to address the systemic institutional barriers that keep women in the workforce from building STEM careers whilst being fairly compensated.

In order to address equitable change in STEM fields and others, we in the private sector and the public sector need to understand the language, the cues, and the baggage of being a woman in the workforce. A majority of our decision-makers are men in positions of authority who have blindly enjoyed their privilege without ever having to understand what micro-aggressions are, why safety and harassment at work go hand in hand with job security, and why having a family and more responsibilities can be perceived to mean one is less serious and less capable of taking on a prominent role in a company, instead of the opposite.

Real solutions lie in helping us become better at identifying and mitigating our learned and subjective biases, individually and organizationally. We need to think about merit at the same time that we think about privilege. We need to think about professional development at the same time that we think about meaningful access and support. We need to think about education and behavioural change for everyone, not just women. We need to deal with the issues at all stages simultaneously, from elementary school, to internships, to continued development and advancement appointments, because tackling only the pipeline portion of this problem does not provide any solutions to the women who are already in the workforce.

Real solutions lie in challenging the notion of fostering, hiring, and promoting only those who look like us. Most hiring policies in the private and public sector favour candidates who are a good cultural fit, a fit decided and informed by the existing privileged class. Lip service to race, gender, and social class understandably does not go far enough in helping decision-makers take into account how social barriers can shape a candidate's experiences and our perception of them.

I would like to close by helping you focus on a statistic that has terrified us at TechGirls into taking action, and I will caveat this by saying that the stat comes from U.S. Labor. A white woman makes on average 77 cents to every dollar her male colleagues earn. When we look at women of colour, that average drops to 55 cents. This is the state of things before we even look at the barriers of social class, access to education, support in professional development, and institutional barriers to health care, the judicial system, and a host of other relevant factors.

• (1130)

The situation is dire but not impossible to resolve. The solutions, however, need to be encompassing and, more importantly, they need to be tried, tested, measured, and improved, as all the panel members have spoken to.

We greatly look forward to the committee's study and recommendations and would like to support you in this in whatever way we can. The top three things we would like to communicate to the committee in regard to what we can do for women in the workforce right now are these: create legitimate transparency in hiring, compensation, and performance reviews; create and support awareness of learned and unconscious biases around race and gender; and invest in and incentivize flexible work infrastructure for both men and women.

Thank you.

**The Chair:** Thank you very much.

[Translation]

Thank you very much for your presentation.

We will now go to questions.

Ms. Truppe, you have seven minutes.

Ms. Sellah, did you want to say something?

**Mrs. Djaouida Sellah (Saint-Bruno—Saint-Hubert, NDP):** I have a point of order, Madam Chair.

**The Chair:** Yes, I am listening.

**Mrs. Djaouida Sellah:** During the presentation by the representative of FIRST Robotics Canada, I perused the document. I appreciate the effort that was made to translate the document, but unfortunately there is a page on the impact of schooling that has not been translated, and of course, the appendices have not been translated into French. I would like to ask that the next time this be done more rigorously.

**The Chair:** Yes, thank you for your intervention, Ms. Sellah.

We will see to it that all members receive the pages in French that were not translated.

**Mrs. Djaouida Sellah:** I would appreciate things being done at the same time.

**The Chair:** Perfect, thank you very much, Ms. Sellah. We will see to it that this gets translated. Sometimes it happens that everything is not translated. There was only a little bit missing.

Ms. Truppe, you have the floor. You have seven minutes.

[English]

**Mrs. Susan Truppe (London North Centre, CPC):** Thank you, Madam Chair.

I'd like to thank you again for being here today. As I've said, it's really important that we get the feedback from the experts out there so that in this case we can hopefully help more young girls get into the STEM programs. I have a couple of questions.

Bonnie, maybe I could start with you. Being in London, I'm familiar with Let's Talk Science. You do a great job. Your name is always out there, so if nothing else, somebody should be hearing about girls and STEM. At what age do you start engaging girls? I'm not sure if I missed that.

**Dr. Bonnie Schmidt:** Our focus is not girls only. Our real values are access and equity.

We start at age two. We have programs that are used in hundreds of child care centres across the country. A lot of what we do is working with and through educators, whether it's in the early years.... For example, hundreds of the aboriginal head start programs on reserves have used much of our early years programming. Also, we help to empower the educators and the parents of young children to bring in and infuse an inquiry-based or STEM-based approach. We have something right up into grade 12.

We have a suite of five programs. Each is tailored quite differently based on the barriers to engagement that both teachers and students face.

**Mrs. Susan Truppe:** Give me an example. What would a two- or three-year-old be learning?

**Dr. Bonnie Schmidt:** Through the brand IdeaPark and Wings of Discovery, we have a real skills-based orientation. Young children would be looking at their natural environment and learning to ask really good questions, whether it's in the playground or in the park, and learning to explore. Actually, all young people's perspective is about the world around us. It's about how we engage their curiosity, their interest in the world, and how we can provide them with the frameworks and the confidence in order to continue to explore.

We've also really excelled in professional development of educators and over our history have trained over 30,000 teachers at all different ages and stages of grade levels. It's a space that we're starting to get back into, especially at the high school level, because at the high school level we're hearing from ministries of education from coast to coast that there's a lack of perceived relevance, and the connection with science, technology, society, and the environment is something that they want to be doing better and more fulsomely but don't have the resources to do so. By convening the provinces together, providing platforms to be sharing practices, and getting materials out, they're able to do that.

• (1135)

**Mrs. Susan Truppe:** Is it Let's Talk Science that would develop these programs for the two- and three-year-olds, or are you working with the boards?

**Dr. Bonnie Schmidt:** Yes, to all of it. We have a pretty competent team that is well versed in education, being classroom teachers themselves or at various levels of administration—



**Mrs. Susan Truppe:** Right, and a lot of volunteers, as I know you said.

**Dr. Bonnie Schmidt:** Yes, a lot of volunteers. The volunteer piece is really interesting. That's the flagship program I started as a graduate student myself. It's now offered through 41 universities and colleges, with about 4,000 volunteers. It brings that experiential participation into classroom and community settings.

**Mrs. Susan Truppe:** That's amazing.

You also mentioned that there is no mandatory grade 12 science or trade that they must take so that they can experience something else while they're in high school. Are you working with the boards on this? Do you foresee any change in that? Are you doing something, or is Let's Talk Science doing something?

**Dr. Bonnie Schmidt:** Absolutely. I think under the banner of our "Spotlight on Science Learning" reports for the last few years, we've really had a good look at the macro level. I can say that the ministries of education from coast to coast are really interested in talking about this issue. It has become a great concern to everybody. How do we scale up best practices? How do we understand where some of the decision points are?

For example, while there is no mandatory grade 12 science credit, it's also very difficult to track optional enrolment. We're seeing that right now at the high school level. Four out of five kids in general are leaving grade 12 without the physics requirements they need for engineering. Those are four out of five kids we've lost before they even make post-secondary choices.

**Mrs. Susan Truppe:** I did some round tables in the last year and a half or so, and I went around to different places in Canada to see how we could get more girls involved in STEM or skilled trades. The round tables started out with the need to get them early in high school so that they would know what courses could be taken. But by the time a couple of round tables had started, it was, "Oh, no, that's way too late. It has to be elementary school so that they're thinking about it for high school." That made perfect sense.

I actually hosted a round table for the Western engineering girls to see why they chose engineering; I was really curious. I think a couple of them had female relatives who were in engineering. Others said that they just looked it up on their own. They said they think the reason for the lack of it is that people think it's just one job, engineering, which I think one of you mentioned. There are so many choices in engineering.

Now, you mentioned the lack of exposure and the lack of role models. All of that came up. What do we do about that?

**Dr. Bonnie Schmidt:** I think one of the biggest things to keep in mind is that there is no magic bullet. If there were, we would have figured the problem out a while ago. It's understanding what the challenges are at each age and stage, and ensuring that there is a cultural approach to it.

I think one of the other pieces, too, is that at the political level, the dialogue is often segregated. We'll talk about climate change, or we'll talk about environment, or we'll talk about health care systems, but often we're not showing the integrator of science and technology across all of these big, big issues that you're faced with making decisions on. It's not connected to science and technology. People

continue to see science as laboratory research, and engineering as.... We're getting way better at understanding what engineering is, but there's still a real misconception there.

So it's understanding the barriers and it's understanding that it changes as people age. It's dealing with parents, who are critical influencers and role models for young people's decision-making. If they're not realizing the influence of STEM on critical global issues as well as workplace issues, then we're missing the boat. It's a cultural piece, and all of us are needed. I think there's no one single player or one single approach.

**Mrs. Susan Truppe:** Thank you. I'd—

• (1140)

**The Chair:** Thank you very much.

**Mrs. Susan Truppe:** Oh, wow. I didn't even get a chance to talk to Dorothy and Karen. Time goes so fast.

Thanks.

**The Chair:** Actually, just as a piece of clarification, we received the presentation from translation services but we didn't realize that some of the slides had not been translated. We will make sure those slides are translated and distributed to all members.

[Translation]

We noticed that.

Ms. Freeman, you have the floor for seven minutes.

**Ms. Mylène Freeman (Argenteuil—Papineau—Mirabel, NDP):** Thank you, Madam Chair.

[English]

Thank you to all of you for your presentations. I apologize that I was a little late, but I've had a chance to look through all your briefs, so I'm up to speed. Thank you so much for being here. We really appreciate it.

Ms. Muzaffar, you were talking about how access and compensation are still very gendered in STEM generally. It's in a lot of fields, but especially in STEM, where you were saying there's 20% less compensation for women. Where are you getting that data from?

**Ms. Saira Muzaffar:** The 20% is an average. It's not specific to STEM sectors.

The last statistic in my statement is from U.S. Labor. I don't have a comparable one for Canada. I did have an opportunity to go through the meeting notes from the committee's previous meetings. Generally speaking, what we're getting from StatsCan is that the data is there, but we're not really looking at what women are making across the board in a fruitful enough way to have a meaningful measurement. Measurement is a challenge in not just compensation.

That being said, no one around this table will disagree that women are still not paid the same.

**Ms. Mylène Freeman:** Thank you.

Yes, there's definitely a lack of data around what's actually happening and where the problems are. For you, what would be your recommendations to try to promote pay equity?

**Ms. Saira Muzaffar:** Transparency; when it comes to payment and performance reviews, you need to set standards. This is where we're looking to government for leadership, because industry will always move ahead. It's business as usual. But until we start changing things in government, we're not going to be able to set standards.

We're doing some really cool experiments at TechGirls. We're working directly with industry and running some beta tests on how hiring policies and performance reviews can be changed. We're conducting facilitation workshops. We have some really brave companies stepping up and putting not just their processes but also their money behind this in saying that they're going to run some experiments and see where they're falling short, and they're going to record this data. TechGirls is fortunate enough to be facilitating this, recording it, reporting it, and sharing it with industry. I look forward to being able to share that information, but we're just starting out on that.

Transparency would be the number one thing.

**Ms. Mylène Freeman:** That sounds really great. I can't wait to see the results. It's great to hear that industry is wanting to be involved.

It would be great if we could promote and enforce pay equity across the board and also maybe encourage women on boards and things like that. Is that also something that you would see as useful?

**Ms. Saira Muzaffar:** Yes. The changing the ratio campaign looks at both compensation and representation.

One of our first campaigns for TechGirls Canada was a very simple campaign, which I think anybody on this panel would be able to relate to. I will share my frustration about it after the fact.

**Voices:** Oh, oh!

**Ms. Saira Muzaffar:** The campaign is called "Portraits of Strength" and it shares poster images on social media of women in STEM fields: women in leadership positions, women in varied and different positions, and all those things that fit under STEM that we have a hard time defining. I love the fact that we can't define it, because I want it to be big and inclusive.

This campaign generated so much feedback, and this was consistently the feedback: "I wish there had been something like this around when I was making career decisions." What frustrates me is that I was brought up in a generation where I was told that these problems were already dealt with, that you already had role models and everybody recognizes that what women are capable of and what men are capable of are comparable and there is no difference there.

Now I'm sitting here and fighting the same battles. It's good that the campaign worked, we got feedback from it, and there's momentum in it, but it's also frustrating that this is still the point we're starting from.

• (1145)

**Ms. Mylène Freeman:** Yes, you're talking about a lot of systemic social barriers. We've even heard from the ministry of Status of

Women that access to child care, for instance, was something that really made a difference. Do you have any other observations regarding systemic barriers or the way that socially we see women in the workforce? Do you have any recommendations around that?

**Ms. Saira Muzaffar:** One of the key challenges we're tackling with industry right now is that male counterparts have great difficulty actually articulating what these barriers are, because they've never had to face them. They're not naturally able to draw the connection between harassment, say, or safety at the workplace, and why somebody would actually put up with that because they think their job is on the line. If they don't call for better changes...

Pay equity is also an issue where our male counterparts will often come to this conclusion. Why didn't you just ask for more and why didn't you just negotiate more to begin with? We're dealing with situations where women are walking in with a mindset that has been socialized, that has been shaped by the barriers that they have faced, the mindset that they're not in a position to negotiate better. We're leaving it on women who are already facing these challenges to come out on top without actually changing the systems, the institutions, and the behavioural norms.

Child care is a great example. I'm sure that people on this committee have heard of Facebook and a bunch of other big sites and companies offering to freeze eggs. Have you heard of this story? Okay. They offered this to their top female employees. They would freeze their eggs, because what these sites and companies were finding is what we are finding, which is that up to a certain point women are excelling in career paths. Then after a certain point that clock kicks in, they need to make a decision, and in their minds the choice is still between starting and raising a family or continuing with their career. Facebook does not want to lose these people. It does not want to lose this talent, so they're offering to freeze the eggs. That's one solution.

Another solution is child care—

**Voices:** Oh, oh!

**Ms. Saira Muzaffar:** —and you could put money there as well, you know.

**Ms. Mylène Freeman:** Okay. Thank you so much.

**The Chair:** I was a little bit confused there, but I think you were talking about the Facebook company.

Indeed? Okay. Because I thought maybe on Facebook....

**Voices:** Oh, oh!

**The Chair:** There are lots of things on Facebook, so I was just a little bit confused. Afterwards I understood what you were talking about.

[Translation]

Thank you very much.

Let's get back to business.

Ms. O'Neill Gordon, you have the floor for seven minutes.

[English]

**Mrs. Tilly O'Neill Gordon (Miramichi, CPC):** Thank you, Madam Chair.

I want to thank all of you for being here with us today.

Your presentation was certainly very interesting. It certainly gave us lots of food for thought. As a former primary teacher, I'm especially happy to hear you say that we are targeting the very young. I'm happy to hear of some of the programs you are looking at. It may just seem very general information, but that's when we can pick up on and find out their interests, and also stimulate them a little bit at that age.

Another important part you mentioned was with the natives. Over my last four years I was teaching at a native school and I enjoyed it very much. I see as well that there are programs specific to first nations. I'm wondering how these programs are designed to engage youth in these communities particularly and if we see much success as a result of that.

**Ms. Karen Low:** We started a couple of years ago with Nipissing and North Bay, engaging through the government people there and the mayor, who was very helpful to us in getting into the schools so that we could show them the program and make it available. They immediately saw that they had people who were interested in it and they jumped on board.

**Ms. Dorothy Byers:** One of the key things our girls really believe is important—I think this would hold true for all of the teams in FIRST—is to look at marginalized students. There's a group in Bradford, Ontario, and our girls actually went out and mentored a team there so that they had the hands-on role modelling of students who were a little bit older than they were.

There are two pieces to that. First of all, the students who are doing the mentoring have such an incredibly rich and diverse experience, and the students who are being mentored are also the benefactors of the support they're getting from another group of students.

• (1150)

**Ms. Karen Low:** We had one student in particular, when I was mentoring the Port Perry team, who was very artistic. He had a lot of Indian designs, and it was just very much from his roots. He was a grade 12 student, almost ready to graduate, and he had no job prospects. Through FIRST Robotics we found that he had such a skill with welding that one of the sponsors, The Metal Man, actually hired him. With his motor skills and such, he is working there to this very day, five years later.

Again, who knew? We didn't even know he had that skill, and he didn't either. It's just amazing sometimes how when someone is put in a particular area, you start to appreciate them for one thing, you start to learn more about them, and you realize just how broad their talents are. We were just very happy, and now, to this very day, we do get money every year from the band there to support FIRST Robotics. It's a win-win.

**Dr. Bonnie Schmidt:** I'll just say that the approach we've learned over the last 18 years is not so much to try to bring indigenous knowledge and put it into our programs; it's to take an approach of

working with the community to understand what their local needs are and identify elders who can go with us.

We've just finished a tour across the Arctic Circle. In February and March I sent teams up in minus 65 degree weather. They came back with great stories, in fact from Moberly Lake just last week. We do have advisers at the national level. Most of the national aboriginal agencies do work with us on a panel. We're finding that it's not so much trying to change or torque the programs to make them work; it's to understand that STEM offers a framework of understanding the world around you. It doesn't really matter where you are. You can still understand the frameworks. It's about capturing young people's imagination and building their curiosity.

If you go into a community with some of the nuts and bolts of programs that are demonstrated to be of high interest to young people, and you work with them and ask, "How can we together make this work for your community?", the uptake is phenomenal. In the far north, or in communities where access is a problem, simply getting the kids engaged enough to come to school is half the battle. We're finding that when we have volunteers going into remote communities, even some of the excitement that the teachers are able to build about having somebody come in and show interest in them is all it takes to get participation rates up and absentee rates down. It gives a great building block. We then start to work with the teachers as well and start to see how we can help to frame their practice so that they can continue to maintain the momentum.

But we actively made the decision to not try to infuse indigenous knowledge. It's not our area of expertise.

**Mrs. Tilly O'Neill Gordon:** No. I can see that, but I guess once a teacher always a teacher, so I'm happy to hear you give this information. I want to say right now that if you ever get the idea to come to New Brunswick, just contact me. We certainly could use your information and all you have to offer.

**Dr. Bonnie Schmidt:** Thank you.

**Mrs. Tilly O'Neill Gordon:** The other note I noticed was the amount. As we know, there are always challenges for girls, and more so, and there are unique challenges for them. What are some of the challenges that we find that are really a struggle for girls or are hitting the girls more than any of the others? You may want to talk about that.

**Ms. Karen Low:** I think one is the socio-cultural notion that they don't know they can do it. We want to get them young enough so that no one has told them they can't.

As we've also heard on the panel, too, it's not going to be an interstate, a clean road. There are going to be bumps along the way. That's where we need a network. To me that's one of the greatest things in FIRST. It gives them other people they can talk to for support when they need it. They're always there as a peer, as someone you can bounce ideas off.

Again, I think, it's giving them the confidence. We've even seen some school teams here where they have two teams. They have one for girls and one that's a coed team. The differences on the teams are remarkable, even though they run side by side.

For women, if they don't know they can do it.... A lot of times you can watch the dynamics and see the guy say that he can program. The neatest thing about programming a robot is that they don't know what gender is. A robot runs on the program. If it's a good program, it performs. If it's a poor program, it doesn't. It doesn't care who the programmer is. All of a sudden, then, everybody is sitting back and saying that they didn't think of that.

Again, it levels the playing field in so many ways, and that builds the confidence. Later on, when they're in a situation like that and someone says no to their idea, they're going to say, "Wait a minute, I know there's validity here and I'm going to stand up for it."

In some ways, it's again that voice at the table that's assured and strong and says, "No, let's look at the data." Again, that's the core we're building inside those young women.

• (1155)

[Translation]

**The Chair:** Thank you very much.

I now yield the floor to Ms. Duncan, who has seven minutes.

[English]

**Ms. Kirsty Duncan (Etobicoke North, Lib.):** Thank you, Madam Chair.

Thank you to all of you for the work you do. This matters profoundly. I have questions for all of you.

Ms. Schmidt, can you expand on your comment that science and technology are not prioritized across the country?

**Dr. Bonnie Schmidt:** Yes. At this point in time, literacy and numeracy seem to be the common denominator for governments as key priorities. It's understandable and we can talk about that. What we've been trying to do is help policy-makers think about the context for teaching the literacy and numeracy skills.

STEM provides a great context, a contextualization, but the fact of the matter is that when you have to try to bring together, either within a province.... Keep in mind that Canada is the only developed country without a secretary of state for learning, or a junior minister for learning, or a national department for education, so we are battling a jurisdictional issue. On top of having 15 systems of education that are trying to talk to each other, you have, within a province, the problem of trying to align a decentralized approach to education, in which a ministry will have the policies and priorities but then often decentralized decision-making at the school level.

There are very good reasons for it but it also means that you need to have your arrow, so if you are talking about what are key elements

**Ms. Kirsty Duncan:** What would the recommendation be to the committee? What needs to change?

**Dr. Bonnie Schmidt:** Well, I personally am very unhappy that technology is not required anywhere in the country and that science is not required in grade 12, but with the caveat that just continuing to ask for more of the same is also not good. Thinking forward to what's needed for skills, attitude, and capacity development, and knowing how much information is out there, I think we have to

actually rethink the skills and competencies that are needed for graduates, and it's not necessarily subject area specialization.

**Ms. Kirsty Duncan:** Okay. We don't have a chief science officer anymore.

**Dr. Bonnie Schmidt:** Right.

**Ms. Kirsty Duncan:** Would that be helpful? I met with another country this morning that has two.

For the panel, would having a chief science officer be helpful? Can I have just a yes or a no from all of you?

**Ms. Dorothy Byers:** I really believe that you need to have a champion, so if there's someone who believes in the importance of a topic such as STEM or science in education at the high school level.... I know that at university it's very different, but we see this in everything we do. If there is strong leadership and there is a voice, then the voice will be heard and it will collect the champions behind it. That will create the systemic change.

**Ms. Kirsty Duncan:** So should we have as a recommendation that there should be a chief science officer?

**A voice:** It's a good step.

**Ms. Dorothy Byers:** It's a good step, yes.

**Ms. Kirsty Duncan:** Thank you.

Ms. Schmidt, you mentioned that a FedDev program had been sunsetted. What was the loss in terms of the funding?

You mentioned the funding that you would like to see going forward. How much is that for, please?

**Dr. Bonnie Schmidt:** The funding that went into the STEM file through FedDev, to my knowledge, was \$20 million over three years. It was launched as a term-delineated project, so it wasn't a surprise when the funding left. That was quite clearly articulated. What was quite reassuring in the 2014 science strategy was that the government put a quadrupling of the amount into NSERC for youth STEM initiatives.

The loss was a loss of the bucket within southern Ontario to allow organizations to scale up and really think strategically about partnerships and implications. We saw dramatic growth in our own reach at Let's Talk Science and in the capacity to build new programs. We were well positioned to leverage it, so we haven't lost. It allowed us to get to the next level of transformation within our organization.

**Ms. Kirsty Duncan:** Thank you.

To FIRST Robotics Canada, I think there was a page in the deck that said there's \$26 million in scholarships worldwide, and we have \$150,000 in Canada. Can you expand on that, please?

**Ms. Dorothy Byers:** The international organization is profound. There's a lot of money in the United States for university and college programs, and there's a slide in our presentation about that. FIRST Canada, remember, has been in place since 2002, and it behooves the universities to step up to enable that type of scholarship money, because it is a change-maker for a number of students who are then able to step into those kinds of programs. It is quite profound.

• (1200)

**Ms. Kirsty Duncan:** What would be the recommendation to this committee?

**Ms. Dorothy Byers:** A recommendation would be to encourage universities and colleges so that we are looking at skilled trades as well as professional choices to be made available, and for universities to encourage funding in those ways for students.

**Ms. Kirsty Duncan:** Should there be funding from elsewhere?

**Ms. Dorothy Byers:** For scholarships, yes, and as you'll see from the slide we presented around the sponsorships we've been able to generate, there are sponsorships from those different organizations, companies, and whatnot. In the United States, NASA is one of the major sponsors, and the profound impact that has on the students—not just in money but in expertise—is really quite remarkable.

**Ms. Kirsty Duncan:** Do you have any other recommendation regarding scholarships? You said NASA in the United States...?

**Ms. Karen Low:** I think there's one other thing. It's a scalable type of thing. It's like the chicken and the egg. We've started out and we don't yet have the number of students that are involved in the U.S. The U.S. has almost a quarter of a million students, so again...and they have a lot more universities. They have 10 at the top. The only thing that's limiting us is that we have a proven program but we don't have enough money to really spread it across all the provinces.

**Ms. Kirsty Duncan:** Your recommendation?

**Ms. Karen Low:** More support.

**Ms. Kirsty Duncan:** Thank you.

Now I want to go to TechGirls Canada. I admired your point that you can't tackle just the pipeline in talking about transparency, hiring, and performance reviews. We know from old studies that if a gentleman's or a woman's name was attached, there were very different results than there were when those names were hidden. Do you have any recommendations here?

**Ms. Saira Muzaffar:** This is a touchy-feely subject. It's very uncomfortable, because how do we change social behaviour when you are talking about government and governing? Providing support for organizations like TechGirls and not just organizations.... These guys are very important. It's about maintaining the education and actually building the pipeline looking forward, but it's also about providing support to organizations that go into companies, into industry, and into school boards to provide models that change behaviours and models that change the way people think, and to articulate barriers faced by people of colour, people with other barriers, and women in general, women with other privileges. There's a lot of stuff that intersects.

When you're looking at putting your report together.... I had the opportunity to briefly go over the minutes from your last couple of meetings, and a ton of the focus is on the pipeline. There's not enough conversation going on in those minutes for women who are already in the workforce.

**The Chair:** Thank you very much.

[Translation]

Thank you very much.

Mr. Barlow, you have the floor and you have five minutes.

[English]

**Mr. John Barlow (MacLeod, CPC):** Thank you.

Thanks very much to everybody for being here today. This is a pretty impressive panel that we have and I appreciate your taking the time.

I want to start with Ms. Schmidt and maybe change the focus a little bit.

For me, coming from Alberta, our focus is definitely on skilled labour and the trades. You talked a little bit in your study about how there hasn't been a lot of growth in women going into the skilled trades. Do you have a reason for that? I know it's maybe difficult to explain, but can you give me some background on why they aren't going into things like welding, engineering technology, petroleum engineering, and those kinds of things?

**Dr. Bonnie Schmidt:** Some of the data we've found is I think perception-based as well, of girls thinking they don't want to necessarily work with machinery and whatnot.

I'll give you an answer as a mom, actually, instead of as Let's Talk Science. I have a daughter in grade 12; well, she's in grade 11 right now, but taking a number of grade 12 courses. In grade 9 she was the only girl in the technology class. It was really fascinating, because the reason she decided she wanted to try the grade 9 tech course was that when we refinished our basement a few years ago, I had her involved in doing the drywalling and the studding and all of the stuff we needed to do.

I'm now very upset with my corners. However, that's another conversation.

**Voices:** Oh, oh!

**Dr. Bonnie Schmidt:** Until then, she hadn't really had too many opportunities to work with equipment and to gain confidence in doing that kind of thing. When she showed up in her technology class, at the beginning the boys were not even wanting to talk to her. Three weeks in, when they realized that she could just outperform them on coming up with the CAD drawings, they started to huddle.

So it took a while to even start changing the culture, but the more work we've done with Skills Canada, the Canadian Apprenticeship Forum, and others who are really committed to and who understand the apprenticeship system.... A lot of it is exposure and experience, and ending the cultural norms that we continue to keep coming back to—that STEM is not connected with trades, or that trades are not a valuable pathway to follow when they are incredibly valuable, or that women are not capable of doing it.

When they try it and they see it, that can actually start to change attitudes. We've found that electricians, I think, are the best represented with women from some of the heavy trades, and it's only 6%. If 6% is the highest, I mean, we're doing a disservice by not letting everybody know the connections and the integration across them.

● (1205)

**Mr. John Barlow:** It's an interesting point you bring up. We had some testimony earlier this year. A lady from Edmonton has a program that she puts young women through, or women looking for a second career, to get into the trades. They make six figures when they're done that six-month program.

Our challenge now is to get that word out there. You touched on that with your daughter. You got her involved at a young age, helping in the basement.

That takes me to you, Ms. Byers and Ms. Low. You mentioned in your submission as well that your ratio for boys and girls, when they start that LEGO League at K to 8, is fifty-fifty. We've heard from many people that our focus has to be to introduce these programs to girls at a young age. It concerns me a little bit that you have such a substantial drop-off when they get to be nine and 10 years old, at 15% down. If we're going to start promoting these programs in skilled trades and the STEM programs to young girls, what are we missing there, even at this point, when they're dropping down 15%?

**Ms. Karen Low:** In some ways, it's a good-news story.

This will sound like it's really gender-biased, but sometimes I take a look at some of the guys in, say, grades 8, 9, or 10, and they're not very good on verbal. They can sit down and do the math and the programming. Then I look at their female counterparts. Well, they can do the math and the programming, but they can communicate and they can do the financial analysis. It's almost like they migrate upstream a bit. That's not saying that they still aren't using those technical skills, because they are, but they're using them at a different level. To me, they're still very important skills, but the skills grow with the verbal competency as well.

**Ms. Dorothy Byers:** Initially I was in a coed school for a long time. What I saw happening time and time again in a science lab was that the girls would be sitting back taking the notes and the boys would have their noses in the test tubes, because the girls would often defer to the boys. I believe what FIRST has done is that in the right environment, with the right mentors, girls really have the opportunity to step in and to understand that they are just as capable, and they build the skills. That's what Bonnie has really been talking about, enabling girls to try it out in a climate where they are accepted and encouraged. That's really where our work must continue.

It's also helping boys understand that girls are, as Karen said, just as competent. They just need to have the opportunities to play with the tools, really, and through that have those experiences and know that they're not to be frightened of the tools, that they can really work with them. One of the pieces that we spend time on with the girls is to make sure that they have a skills training session for part of the year so that they develop great confidence in using any kind of tool they work with.

**The Chair:** Thank you.

Ms. Schmidt, please answer very briefly.

**Dr. Bonnie Schmidt:** Very quickly, I think our recommendation would be as simple as raising awareness of the breadth and diversity of opportunities. I can't tell you the number of guidance counsellors, teachers, parents, and others who have said, "I didn't know. I just didn't know."

[Translation]

**The Chair:** Thank you very much.

I now yield the floor to Ms. Liu for five minutes.

[English]

**Ms. Laurin Liu (Rivière-des-Mille-Îles, NDP):** Thank you for the wonderful testimony we've heard today.

Thank you, Kirsty, for bringing up the issue of a chief science officer and what that person could do in terms of promoting women in STEM. It's something that we've been working on a lot. Actually my colleague, Kennedy Stewart tabled a private member's bill to create the position of the parliamentary science officer. I think absolutely that's one of the mandates that this person should have if ever that position is created.

Last week we had somewhat of an uproar about the fact that the Canadian Science and Engineering Hall of Fame didn't actually have any women nominees, so we had two women step down from the selection committee around this. I think it's something that really brought awareness to the fact that these awards and these places are very male dominated and continue to be. I think there's no reason why we shouldn't have female nominees. I mean Roberta Bondar or Patricia Baird are some of the female scientists that we absolutely could have nominated for the science hall of fame.

What could the Government of Canada be doing to encourage female role models, particularly in these kinds of institutions where we really recognize scientific excellence?

I guess we can start with Ms. Schmidt and then work around the table.

● (1210)

**Dr. Bonnie Schmidt:** I'm not intimately aware of what was happening at the hall of fame but what I did understand, and my bigger concern, was that there were only four nominees that were brought forward at all. The fact that there are only four nominees was a problem because we do have deep expertise in Canada, male and female.

When it comes to promoting role models, I think that we are starting to see a shift. At Let's Talk Science, we've been around for 20 years so we can start to see some trending. But out of our volunteer base of over 4,000 volunteers each year, well over 60% are women, so the recognition and the logistics coordination to help match people up with opportunities is really important. FIRST is doing a great job in getting industry mentors working with teams. We've been matching people for many years on some of these opportunities. It really is in part logistics, making awareness known, and legitimizing the importance of participating as a volunteer.

Within industry, we've had countless numbers of companies say they would really like us to structure an environment in which they can mobilize their volunteers, so we do that. We do the infrastructure. Then we go back and nobody comes out or only a few people come out because the companies haven't truly endorsed time away from work to get involved in some of these initiatives. Therefore, employees not only have to volunteer but they have to get caught up on any work they miss. It is this cultural piece. It takes everybody. It takes a country to raise a child and everybody has a bit of a place in it.

**Ms. Laurin Liu:** Does anyone else have anything to add to that question in particular?

**Ms. Karen Low:** I've had the chance to work with a number of research folks at different universities. I have to say there is tremendous work going on, male and female, across the country whether it's Dalhousie, Waterloo, or McGill. To me, if we just even showcase that so our young people could see it and aspire to it. It's there. It's happening every day. It is amazing.

**Ms. Laurin Liu:** I have a quick question for Ms. Muzaffar.

Yes, we know that there are barriers for women in science and technology, but could you expand more on the intersectional aspect of it? Are there specific challenges for racialized women, low-income women, or other kinds of women? How could we look at this issue in a more intersectional way?

**Ms. Saira Muzaffar:** May I very quickly answer your previous question? What I'm hearing right now, just as a marketing professional, is that your biggest challenge is communicating to people that opportunities are already out there, and we know this with women who are already in the workforce.

Create and recommend, as a committee, a flagship campaign that promotes women in the workforce. We don't see things like that. We're starting to see campaigns that focus on skilled trades because we know that's a need coming up. But are you focusing on a key demographic? If you were to turn this into an ad campaign, if the key message you want to communicate is "we want more women in these fields", then say that as a message, not a general message that is gender neutral.

Sorry, now on to the question you actually asked me: yes, the barriers are that we are not willing to talk about race in workplaces. We are not willing to talk about what harassment looks like when it comes to job security. We're not willing to talk about the fact that there are things women face in the workforce that are different from their male counterparts. What we are told is that if you work hard enough, if you get enough experience, if you are tough enough, if you act like it, you will get where you need to be.

That is the mindset that we enter the workforce with. We probably get that mindset a lot earlier on. We probably get it at that key drop-off point where you get kids excited when they're younger, both girls and boys. As they grow older and socialization take more of a hold, they get the reinforcement back from media, from government, from our education system, at home, at school, in society in general, that they're not meant to do these things and they're not meant to play leadership roles in these sectors.

I would think that intersectional stuff is very important and you should definitely have that as part of the conversation this committee carries out.

• (1215)

**The Chair:** I hate my job in these moments.

[Translation]

I am so sorry to interrupt you. I think that we have understood your message quite well. I thank you very much.

Ms. Crockatt, your turn to have the floor. You have five minutes.

[English]

**Ms. Joan Crockatt (Calgary Centre, CPC):** Thank you very much.

I have to say that one of the things I love about being an MP is panels like this today where I feel very inspired by this powerhouse of women we have here in front of us. I heard Dorothy say that if there's a voice, it will be heard. You guys are screaming—I'm sorry, you're not screaming, you're making your voices heard very much here today and I thank you for all of your work.

One of the things we need to do is to make sure that people are getting out a positive message but, as Saira said, the right message.

There was something we heard earlier in committee that I would like to ask you about because I think this is drilling down. We don't need a general message so much anymore that we want women in science and technology. We need to say what areas of science and technology because we do have some information on this. Statistics Canada shows that 39% of university grads, 25 to 34 years old, were women who took a STEM degree. Among those grads, 59% of them took science and technology. Only 23% took engineering, math, and computer science. What the statistics were showing, and we've had a couple of previous witnesses saying, was that women tend to take the soft sciences and the life sciences. Those are not high-paying jobs as much as computer science, engineering, and math.

To your point, if we're thinking about women in higher-paying jobs, it would seem to me that we need to get the message out that women should be looking at those fields, not just the general science field but those particular fields. I just wanted a chance for maybe all of you to quickly touch on that so that I can also ask you about something else.

Maybe Saira, we'll start with you and work our way across—just quickly, please.

**Ms. Saira Muzaffar:** I think what you've said is very important and I wouldn't want to disagree with it by saying don't try it at all. Try it and measure it. The only thing I would flag with that message is that when you're looking at jobs within STEM that pay better, let's also look at the fact that women in general need to be paid better.

**Ms. Karen Low:** Having worked for 33 years in industry and engineering, to me, as a woman, pay is only a piece of it. As you talked about earlier, there is the flexibility. As you move up in higher management and you're leading a global team, it's just the hours, the travel. There is a whole lot more, so as for pay, as much as I think a lot of women aspire to the pay, you always have to look at your family dynamics as well. That's just another piece of the puzzle.

**Ms. Dorothy Byers:** I think women certainly want job satisfaction. That's been well documented. If they're finding a place where they understand...and if a program like FIRST or any of these are able to help girls understand what engineering is and whether this is the place where they're going to feed their passion, then that's something that we really must promote and help them understand.

**Dr. Bonnie Schmidt:** My experience kind of builds on what Dorothy touched on, which is the social implications. Often women will veer towards the fields that they feel are having an impact, whether it's an impact on society or an impact on other people. In terms of the connection between things like engineering and some of the problem solving, in our survey we found that engineers were not perceived as trying to help people. That was really enlightening for me in terms of thinking differently about how we communicate the social impact and the implications to our world of some of these other positions.

**Ms. Joan Crockatt:** I think that's very apropos. That's kind of where I was going to go next, the perception that girls have. I loved your story about your daughter being thrust into an area that we wouldn't think girls were naturally adept at, construction. But I think that the telling of those stories, as Saira mentioned, is important because women need to see other women in those roles as role models.

Dorothy, I'm just interested in whether you can expand on your experience because a couple of times we've heard about girls needing to be on all-girl teams, and that's where we see girls really stepping up to the plate. I wonder if you could just talk about whether we need to keep segregating girls or whether...?

We've seen this bystanders thing with sexual abuse, where we need bystanders to step up, and the campaigns have been quite effective. Do you think we need a campaign where we start showcasing this for girls, for example, in social media campaigns? How do you feel about that whole area?

• (1220)

**Ms. Dorothy Byers:** I think if you give girls role models they're going to thrive because they are going to aspire to that. They will believe that if someone else has done it, I can too. What I have seen in all-girl teams is the opportunity for girls to do anything. They are the electrical engineers. They are the CAD designers. They are the construction people. They're the programmers. They do everything because they are in an area where they are respected as women.

Looking at the cultural shifts needed to be able to give girls the opportunity to have that sense that they can do it because the team they are working with believes they can do it, I believe working with mentors and teachers in education across the board is important to be able to help everyone understand that women must have a place at the table. Unless they have a voice their wisdom is not going to be

part of the creativity and the curiosity that everybody else on that team is going to have.

**Ms. Joan Crockatt:** I was just going to say our Minister for the Status of Women is a pediatric orthopaedic surgeon. She has her MBA. She's been on Genome Canada and I think she is really helping us push these programs ahead for girls, including the recent mentorships. She's had 6,000 mentors across the country, so I encourage people to get involved with this more.

[Translation]

**The Chair:** Thank you, Ms. Crockatt.

Ms. Perkins, you now have the floor. You have five minutes.

[English]

**Mrs. Pat Perkins (Whitby—Oshawa, CPC):** Thank you, Madam Chair.

Thank you all for your presentations. They were all excellent.

To you Dorothy, with respect to your team going to the big championships right now, I wish you luck. But I also wish the girls from Trafalgar luck too, from our town, the all-girl team that's there. Maybe they'll get into some sort of a playoff against one another. That'll be fun.

I did enjoy going to the FIRST Robotics championship over in UOIT Durham College. Thousands of young people were able to come and be a part of that, and seeing all of those young women and young men who were there, they were all inspired by one another. I was tremendously taken with that.

Karen, if I am not mistaken you are an engineer, correct?

**Ms. Karen Low:** Correct.

**Mrs. Pat Perkins:** Think back to when you were in elementary school. I'm not sure, but I'm going to suppose that you had a choice of taking home economics.

**Ms. Karen Low:** Like many students today, there are a lot of girls who would love to take shop class, but again when you start looking at timetabling there are really some hard interfaces and you can't do both. This is also because we don't have a grade 13.

Having three kids go through the system, the public system, trying to just get all of the electives and everything else for science, you don't have a lot of time to take those extra ones. To me it's the co-curricular, the extracurricular activities, whether it's working in a basement, at FIRST Robotics, TechGirls Canada, wherever these kids are getting the hands-on.

I had the fortunate chance.... I was going to be going to go to a big name university, but my dad had a medical problem and we had no funding. However, that was.... I was like the lucky squirrel that found a nut. I was able to go to a co-op school, which was phenomenal because I could work, I could go to school, and it gave me a chance to try out positions I didn't know whether I wanted or not. In six weeks you can go anywhere and decide whether you like it or not. But it was that hands-on that grew my experience over five years to get a degree and get a master's.



To me whether you get that in a school setting or co-curricular, it's just phenomenal. I wish everyone had that choice.

**Mrs. Pat Perkins:** You went into the automotive industry as an engineer.

**Ms. Karen Low:** I did. That's correct.

**Mrs. Pat Perkins:** We're blessed to have you as a mentor for people. I'd like to point out that back in the day, before most of you were born—

**Voices:** Oh, oh!

**Mrs. Pat Perkins:**—you had home ec or shop classes. That was it, and it was only home ec for girls and only shop for guys. So we have come a long way from the day of that mindset. I am delighted to see more women mentoring women and I think that the more we can do that.... Would you agree that women mentors are really the resource that we should be trying to mine?

**Ms. Dorothy Byers:** I would certainly support that.

In preparing the brief I did quite a bit of research, which I really thoroughly enjoyed—and I mean that sincerely. There's a wonderful magazine that was published by the American Association of University Women that focuses on STEM. It has two huge articles in it that talk about the role and impact of mentors on girls and how critical it is for them to see women in positions to which they might aspire, or maybe not. As Karen says, it gives them an opportunity to ask the questions, to work cheek by cheek, and to really understand what they're building and the challenges they face, and then, when they're done, to be able to continue with those mentorships when they're in university. Harvard has an amazing program as well, and so does Columbia University, for girls working with women who are slightly older than them and then continuing that relationship in their professions. So they're really gaining strength through that key recommendation.

• (1225)

**Mrs. Pat Perkins:** Bonnie, I know you want to weigh in on that, but I have one other question that I need you to answer as well. That is regarding the STEM acronym, which you're saying is just not resonating with people. At some point before you all leave today, I would like you to think about that and tell us what you think we should be doing about it. Should we be advertising it out there so people understand it? Should we be making some changes? I'm not sure what the answer is, but it's obviously something that you could speak to at some point.

But, Bonnie, you wanted to weigh in.

**Dr. Bonnie Schmidt:** Sure, just quickly on mentoring, while I absolutely agree that it's critical to get more women in mentoring roles, I would not like to do it at the exclusion of engendering men in helping with this. I have a Ph.D. in physiology and some of the best mentors I've ever had in my entire career have been men. So it really is getting under that cultural piece of doing that.

On STEM, I've been scratching my head about it for 20 years and I'm actually at the point of nearly giving up and just adopting the global acronym and trying to get it out there as something. The U.S. has adopted it. The last 10 years they've been using it. It's a globally used acronym that Canada is really just picking up. It's very difficult, and in my favourite world it would just be a case of saying that we

are living, we are alive, and this is an integrated approach to what we need to do for the 21st and 22nd centuries. However, you can only hit your head against the wall for so long and say, okay if people understand STEM to be this, then let's make sure they understand that. If you can come up with an answer, I will adopt it and spread it out there, because we're struggling.

**The Chair:** Thank you.

**Dr. Bonnie Schmidt:** Now the nearest one is “STEAM”, because we need to include the arts. But this is where I think the labels break down, so recommend or come up with a word that we can all use and get behind.

[Translation]

**The Chair:** Thank you very much.

If you have any ideas or flashes of genius similar to those in the presentations, please convey them to us.

Ms. Duncan, you have the floor. You have five minutes.

[English]

**Ms. Kirsty Duncan:** Thank you.

To FIRST Robotics, you mentioned that you engage students in under-resourced areas. How do you do it? Do we have any metrics? In how many schools do you do that, with how many students, and how many teams?

**Ms. Dorothy Byers:** I don't have all the metrics for it, but what I would like to say is that in being able to work in areas that are under-resourced, it's about the opportunity that FIRST has to be able to meet the needs of the teachers in the schools or the board when they put their hand up and say, this is something that we would really like to have for our students. Just the growth that we've been able to see through the funding of the government has really helped us achieve that goal.

**Ms. Kirsty Duncan:** Can I ask you to table with the committee the stats that you do have for under-resourced areas?

Would it help to have funding for those specific areas?

**Ms. Karen Low:** Absolutely. We have a couple of slides that I don't think were translated, so I can't show them to you. But if you do have your hard copy, you might just want to take a quick look at them. You'll see the three-year federal funding that we have—and, Bonnie, you spoke to this as well—and that we were able to grow our programs at a rate of about 30% a year. Again right across the board, whether it's junior FLL, FLL, or FRC, we knew there was a sunset but were sitting there saying that we have about a year, that we can run our programs for about a year and after that—

**Ms. Kirsty Duncan:** So the recommendation would be very specific.

**Ms. Karen Low:** Very specific, yes, absolutely. The only thing holding us back from serving more of those underserved areas is funding.

**Ms. Kirsty Duncan:** Thank you, Karen.

Ms. Muzaffar, you raised a really good point on micro-aggression. As you say, women are still chastised. The reason women aren't making the same amount of money is because we don't negotiate.

Can you comment on what your very specific recommendations would be here?

• (1230)

**Ms. Saira Muzaffar:** My very specific recommendation would be that, as a government, you could gain a lot for us by incentivizing industry to change behaviours within workplaces. As a government, you cannot sit in boardrooms, cannot sit in on performance reviews, cannot sit in on all these other touch-points where micro-aggressions make a play, where women feel unsafe or feel what is now known as imposter syndrome. The specific recommendation would be to let TechGirls Canada, or organizations like TechGirls Canada, run beta tests on how things can change within workplaces; incentivize or make it easier for industry; and celebrate the fact that industry is getting behind changing the ratio, addressing intersectional issues.

**Ms. Kirsty Duncan:** Can you give us examples of micro-aggression?

**Ms. Saira Muzaffar:** A micro-aggression would be if you sit down for a performance review and somebody tells you that when you're sitting with clients you should smile a lot more. That's a micro-aggression because that comment would not apply to a male counterpart. "Smile more", "be polite", "be nicer", those are micro-aggressions. They are subtle social cues. Usually, but not always, these cues are socialized through men and women to the women in the workforce to make them fit a certain part. They're not saying anything that's illegal; it's not overt harassment. I am not the best person to give you more examples right now.

**Ms. Kirsty Duncan:** Perhaps you could think about it and table with the committee other examples of micro-aggression, as someone who was in an environment where you were asked when you planned to get pregnant and to take leave, or finding out that your pay was in the bottom 10th percentile of your workplace and being told that it's because you're a woman. I'd be grateful if you could table some of these examples with the committee.

**Ms. Saira Muzaffar:** Absolutely, I would love the opportunity to do that. Thank you.

**Ms. Kirsty Duncan:** Thanks.

[Translation]

**The Chair:** Thank you very much.

We will continue this discussion with Ms. Bateman, who has seven minutes at her disposal.

**Ms. Joyce Bateman (Winnipeg South Centre, CPC):** Thank you, Madam Chair.

[English]

Thank you all so much. It's days like this that it's a privilege to be on this committee. It's an absolute privilege to hear the details of the work that you're doing and the difference that you are making. There are so many pieces to this.

It's funny, you made me go back.... I have a 17-year-old daughter, and I remember that in grade 5 we had a robot to build. We had every body part, and hers opened and we saw the insides of the kidney, or whatever. Anyway, it hadn't really pasted together. Interestingly, she is in Grade 11 and is one of the few girls in her high school who is not only in the IB program but also in the physics class. There are three girls in the physics class, I think.

**A voice:** Tough mom.

**Ms. Joyce Bateman:** I think it's her too, but it shows the importance of starting. Who knew? Maybe it's because of grade 5. Maybe it's because of that teacher who maybe got trained by you on how to do these interesting extra pieces in the classroom.

I think it was you who mentioned STEAM. I was just at Balmoral Hall last week because they had the world map. It was so fascinating and wonderful to talk to these young women. I learned there that it was STEAM instead of STEM. I guess it doesn't matter what the label is in terms of how we make the difference. Frankly, and with the utmost respect, Saira, regarding your comment that you have to tell them, you don't tell teenage daughters what to do, or it's at your peril. You have to present the opportunities that they will then choose to embrace. How do we do that in the context of the missed efficiencies that you said are prevalent in this?

**Dr. Bonnie Schmidt:** I might be able to tell you more in October. In the field right now we're doing a survey of parents that complements the one we did with the kids last year, helping to understand what parents' perceptions around STEM careers are, the type of work that would be within STEM, and understanding parents' knowledge of their own ability to influence kids.

From the research that we've done on parental influence, it remains the number one influence on young peoples' selection of high school courses and the beginning of post-secondary pathways. They don't have as much influence on careers, but definitely on academic pathways. Teachers' influence is very high, but they're not trumping parents yet. However, a survey that we did a couple of years ago said that only 20% of parents were having a discussion with their kids about some of these pathways. Even though you can't tell them, you have to try to explain it to them. The fact is that they're subtly listening and parents who are not recognizing the influence they have around academics, because they didn't remember it that way when they were young, and whatnot, are a critical factor in a study that we're doing right now.

• (1235)

**Ms. Joyce Bateman:** That makes me think about your comment that engineers aren't caring.

**Dr. Bonnie Schmidt:** It's the perception of kids.

**Ms. Joyce Bateman:** My father is an engineer. Oh, my goodness, that Kipling ritual meant everything to him. He always told us the story about how lives are saved, or not.

**Dr. Bonnie Schmidt:** Most people don't know that the ring signifies safety, a commitment to safety, right? A lot of people don't understand that.

**Ms. Joyce Bateman:** It's so interesting how it all connects.

I think it was Karen who talked about the electricians being the highest, or no, it was you—at 6%, right? That's the success story.

We'll look forward to hearing in October about the missed efficiencies. If we don't start with the very young, I think we're going to be lost. We clearly are making progress, although my daughter, because she has two chartered accountants for parents, never got to the do the basement because we don't feel confident doing drywall. That's a wonderful thing.

Somebody said you don't know how to match it up and you don't know how to showcase what's out there. Could you speak to that?

**Dr. Bonnie Schmidt:** Twenty years ago there were very few organizations that were actually in this space. Universities didn't have science outreach offices. Flash forward now and there are hundreds and hundreds of organizations. Only a few have a national perspective, but there are literally hundreds of organizations. Because of the lack of funding in the sector, it's very difficult. You would think it would drive consolidation or drive efficiencies. It's actually having the opposite effect of, "Oh, my God, I'm too busy trying to find my own money, I don't have time to be strategic in creating partnerships."

Some of the opportunities that FedDev has, with some level of basic funding available for some of the bigger players, started to cause partnerships to form because we weren't so stressed. You could sit back and think a little bit more strategically about what communities we should be going into, because FIRST is maybe here but we'll go over there, and whatnot. Some of those synergies can actually be driven with an incentive model, and not a negative incentive model.

**Ms. Joyce Bateman:** If you have concepts or ideas that didn't make it into your paper but you'd like to share with us, we would welcome hearing about those. I know that the clerk would make sure that all members of the committee receive them. That's sort of the solution piece.

Over to you, Dorothy, on the same point.

**Ms. Dorothy Byers:** Getting the system to work together is one of the pieces that FIRST has really been able to do through the support. As Bonnie said, if you're not worrying about the funding it gives you the opportunity to reflect and plan to be able to engage with community partners across the country. That really enables you to systemically and thoughtfully go into different areas in the country, like Calgary, for instance, where there was a competition started about five years ago. That was a grassroots competition. It was actually a girl from our school who saw that as something she really wanted to do. She is a biomedical engineer and develops prosthetic devices for people who have spinal injuries. She understands the caring part of being an engineer. It was through FIRST that she really developed that.

To have the opportunity to look at how you can work with universities to help spread the word.... This is the STEM question again. What is this thing called STEM? We're behind. They're talking about STEAM a lot more now. In speaking with students, they will tell you that engineering and science and technology are more about curiosity and creativity than about numbers. They've got it; they understand that. For us to be able to have an opportunity to spread that and draw in as many community partners as we possibly can, that is really how we can engage girls and women in this particular kind of work that we're really trying to do. Also, to help them understand that, as Saira talked about, they get so far.... Karen and I joke about the noxious gas—that there's that glass ceiling. We believe and are told that we can get through it, but somehow there's this layer of gas up there and you just can't get through it to get through the ceiling. That's what we have to help the current and next generation of girls to be able to do.

●(1240)

[Translation]

**The Chair:** Thank you very much.

**A voice:** Is that all? What a pity, Madam.

**The Chair:** I am sorry, but your time is up.

Did you want to add something, Ms. Muzaffar? No? Very well.

Ms. Liu, I yield the floor to you for seven minutes.

[English]

**Ms. Laurin Liu:** Thank you, Madam Chair.

Thank you, Ms. Muzaffar, for talking about the issue of micro-aggressions as well. It's so hard to point out, but it happens, and it happens to women in a lot of male-dominated sectors. In fact, I sit on the international trade committee and we're speaking to SMEs right now, and it's something that we're hearing about from female entrepreneurs as well. When they try to get loans or when they talk to clients, it's the same kind of thing, so I think it's really important to bring that up.

We also know that women deal with specific needs in the workforce as well. I've been speaking to female entrepreneurs who have to be on conference calls on their cellphones while they're picking up kids, and the kids are yelling in the background when they're on the phone with their colleagues.

How can we take into consideration the specific needs in terms of a work-life balance for women? How could we create more STEM positions that support employees who have responsibilities relating to family care or elder care?

That's for any one of our witnesses.

**Ms. Saira Muzaffar:** On changes in the workplace, this is something that I am learning about on the go as part of TechGirls, as are micro-aggressions.

Flex schedules have gains not just for women but for all caregivers, and yes, women are still predominantly the ones who are taking care of dependants at home, and not just children but also the elderly. That's not going to change, but it may evolve. If we actually achieve equality and equitable change, you will see more men playing this role because more of us are getting older, and that will happen.

On changes for a flex schedule and the ability to work from home, I can tell you that when I started working it was a privilege to be able to work from home. It was not something that was a standard, which makes no sense to me now, sitting in the tech industry, because my schedule is 24 hours a day. My tools work 24 hours a day. My office is not my desk. My office is my phone. My office is my computer and my tablet.

As for changing the way people picture what a workplace looks like, changing how compensation is tied, and how performance reviews are tied, if you have the pressure of having to clock in and clock out from 9 to 5 when you need to drop your kids off at 9, and if you are going to stick with that if industry is not able to evolve, then having after-school and before-school programs that are affordable, available, and accessible would also play a giant part.

I think those are some of the key points.

**Ms. Laurin Liu:** I think that delves into the question quite a bit.

Ms. Byers, in your earlier response, you talked about how curiosity and creativity really attract girls to science and how we have to start talking about science in that kind of context. Unfortunately, we know that at the federal level we've oriented the NRC and NSERC more towards industry or industry science. Amounts for the discovery grants program have gone down, so we've really started taking financing away from discovery-related science. In and of itself, I believe that's a bad thing. You never know what applications science may have down the road.

Have any of you done any kind of analysis on whether this has a gendered effect on women in science? Do you have any numbers or information on that?

• (1245)

**Dr. Bonnie Schmidt:** Let's Talk Science hasn't done any analysis on some of the funding and research allocations, but I know that NSERC has done quite a number of gender-specific program reviews, and with the women in engineering chairs, has actually produced a number of reports looking at things like that.

**Ms. Laurin Liu:** If you find anything, it would be interesting to table it for our committee as well, because these changes are quite recent. I'm not sure that there actually have been studies carried out on that.

We've also talked in committee about the importance of diversity at all levels. A lot of people have brought up the importance of ensuring equal representation on hiring boards as well. We've talked about how removing names on initial job screening applications has an effect on hiring women. How could we further take away or remove some of the unconscious biases in terms of hiring, selection boards, and allocating funds?

**Ms. Karen Low:** I'd say having females on those selection boards is going to be a significant step in the right direction because, again, I think that sometimes men and women communicate differently. They have different expectations. Again, having a diversity within that hiring board I think would be helpful.

**Ms. Laurin Liu:** How could the federal government encourage more female ministers in science-based ministries? How could we encourage more women to head science-based parliamentary studies? Would you have any recommendations on that level?

**Dr. Bonnie Schmidt:** There must be a database of female scientists who are here.... People such as Elizabeth Cannon get named to things numerous times. The president of the U of A, Indira Samarasekera, is on quite a number of things. I think it's about getting access to the names. I've been really impressed with the Status of Women priority on women on boards, the initiative that was tabled earlier this year, which has definitely applied trying to find the recommendations.

In all honesty, I think that it's sometimes not a desired goal to not choose women, but just a lack of awareness of who might be available and interested and of the networking. As you start to have opportunities to integrate, to promote, and to showcase the campaigns for where the talented women are, you can see that there are a heck of a lot of them—look around the room—getting their

names out there, and it's helping to prepare them for some of the leadership roles.

**Ms. Laurin Liu:** The federal government also has a system they use called “gender-based analysis plus”, which looks at gender-based analyses of legislation. The “plus” takes other factors into account, such as age, education, language, geography, etc., so this deals with other issues and includes gender. Do you think this has been used effectively by the federal government to date?

**Dr. Bonnie Schmidt:** It is beyond me to comment. I don't know.

**Ms. Saira Muzaffar:** I actually don't know anything about that, so that's probably an indication of how effective it's been so far.

**The Chair:** Thank you.

[Translation]

Thank you very much, Ms. Liu.

I now give the floor to Ms. Truppe for seven minutes.

[English]

**Mrs. Susan Truppe:** Thank you, Madam Chair.

Now I'll ask my questions for Dorothy and Karen, which I didn't get to ask last time.

You mentioned—I don't know if it was in the 1980s—that there were 26 teams and two were girls' teams. Is that right?

**Ms. Dorothy Byers:** That was in 2002.

**Mrs. Susan Truppe:** It was 2002. I couldn't hear that first part. Then I think you said that there are 4,300 direct participants now. Is that right? It was something like that. I was wondering if you knew how many of those participants were girls. Or do you even have that?

**Ms. Dorothy Byers:** I don't have that specifically, but if you look at the 10 teams in Canada and the probably 30 girls on each one, you can get a bit of a ballpark on that. I can tell you that of the 23 all-girls teams in the world, 10 of them are in Canada.

**Mrs. Susan Truppe:** That's wonderful. That's really good.

**Ms. Dorothy Byers:** Yes, it's pretty awesome, actually.

• (1250)

**Mrs. Susan Truppe:** More people should know about that.

You also mentioned \$150,000 in university scholarships. Of those scholarships, what are they for? Are they split evenly between the girls and the boys or are they for them to develop themselves more in STEM courses? What are they for?

**Ms. Dorothy Byers:** The university scholarships are awarded the same as any scholarship would be awarded. Some of them are phenomenal, with  $x$  number of dollars over four years. It would be the universities that are not using any kind of determination as to whether it's a boy or a girl receiving a scholarship.

**Mrs. Susan Truppe:** Right, so it's not whether it's a boy or a girl and not necessarily taking STEM courses per se?

**Ms. Dorothy Byers:** No, those are—

**Dr. Bonnie Schmidt:** That's required.

**Mrs. Susan Truppe:** Oh, they are. That was the other half of my question.

**Ms. Dorothy Byers:** Also, it's their experience in FIRST as well.

**Mrs. Susan Truppe:** That's really good.

The other thing you mentioned was the federal support of \$1.5 million over three years. You got provincial support as well. What do you use that for? Where does the money go to, not to the penny but just roughly?

**Ms. Karen Low:** We're a very lean organization. Some of it does go to administration. About 35% goes to direct support of teams and another 35% goes to the support of the FRC, the regional events, because we have costs for that.

Ideally, we would love to entertain perhaps \$8 million over four years on a go-forward basis, because one of the things we've realized in talking to more underserved areas is that not every community has a resource like a large business there to pull mentors from and stuff. We're finding that we're doing more and more on computer outreach and community-based groups, in addition to the schools. We also find that for the folks in Quebec now, a lot of the schools there are doing a lot of work in translating everything into French and are also working with teams overseas.

**Mrs. Susan Truppe:** That's good.

**Ms. Karen Low:** It's just an amazing international network. Again, the funding is key.

**Mrs. Susan Truppe:** Absolutely it's key, and we're always very happy to support it.

Bonnie, in your recommendations you talked about endorsing the funding and supporting that. Can you elaborate on that? What was that for?

**Dr. Bonnie Schmidt:** The science, technology, and innovation strategy that was released in December had a new piece in there that was putting \$10.9 million per year into NSERC's PromoScience fund. That has been a core funder of many of the outreach organizations across the country. I hope it will be deployed strategically. It about quadruples the amount of money. I think it's a very good step in the right direction.

**Mrs. Susan Truppe:** Great. Thank you very much.

I'll split the rest of my time with my colleague, Ms. O'Neill Gordon.

**Mrs. Tilly O'Neill Gordon:** Thank you.

First of all, I was glad to hear you say that the growth resulted from the funding from our government. As we all know, we certainly have a great concern for the youth of our country, so I was glad to hear you say that.

As well, we often see that there are many challenges in these programs, especially for young girls. I was thinking that one of them would be scholarships, but you were saying that you have much access to scholarships and that scholarships are not a problem in that area for STEM, right? I'm wondering if there are other challenges that you see more often for girls.

**Ms. Dorothy Byers:** Especially when they're going off to university, having someone in a mentorship position is key. Most often, for girls who have been through a program and are really finding their way, if they've had an experience in FIRST we know that they've developed the competencies they need, and that will often lead to the confidence they have. The third piece is the connections they need to make, which they need on an ongoing basis to be able to reach out to a network. It may be at their specific university or it may be nationally. Karen alluded to technology; they could be Skyping with people.

As Bonnie said, it's important to include mentors who are men as well, who believe in them as women in those roles, because that's the systemic change we need to see. It doesn't matter what gender you are, you are appreciated for what it is you can do. That's the key piece. It's not just women supporting women, but it's a cultural shift to be able to promote girls in those ways.

**Mrs. Tilly O'Neill Gordon:** Do you have something to add, Bonnie?

**Dr. Bonnie Schmidt:** It's a complex question. Again, it's very hard to say there's a magic bullet.

I think we've covered a lot of it. It's around experiences and knowledge and awareness, and the recognition that social influences are very strong. I'm still struck by the number of times I hear "I didn't know that" as being a core element of decision-making.

I think sometimes we trust our teens to know how to project into their future. It will take all of us to help them realize the opportunities.

**Mrs. Tilly O'Neill Gordon:** So that is one challenge we face.

**Dr. Bonnie Schmidt:** It's a big one.

**Mrs. Tilly O'Neill Gordon:** It's trying to get the message out in the schools and with parents as well.

**Dr. Bonnie Schmidt:** Yes.

**The Chair:** Thank you.

[Translation]

Ms. Duncan, you have the floor, but please be brief because we are coming to the end of our meeting.

● (1255)

[English]

**Ms. Kirsty Duncan:** I guess I will.

Ms. Muzaffar brought up a very difficult topic, which is micro-aggression. It does occur.

Would any of the other panellists like to address this?

**Ms. Karen Low:** I'd just like to make one comment. As females, I think we've all been in situations where we've had it. I have found that perhaps the best thing I can do if I'm in that situation is to just take a moment, one to one.

If you as a male said something to me, John, and I was uncomfortable, I would come back and say, "John, I'm really uncomfortable with that. Can you tell me what you meant?" Would that make you think about what you said?

Female to male, that's what I have done. I've said, "Can you reframe that? Because I'm really confused now. I thought we were looking at my actions and the results, not whether I smiled or blinked my eyes twice."

**Ms. Kirsty Duncan:** Or asked whether you were pregnant....

**Ms. Karen Low:** Or asked whether you were pregnant.

**A voice:** I think it's illegal.

**Ms. Kirsty Duncan:** It's supposed to be.

**Ms. Karen Low:** Well, that happened to me. But I think you can turn that around. I had my boss ask me that. I had two children, a boy and a girl. He said to me, "Oh, my God, you're pregnant. Weren't you going to stop because you had a boy and a girl?" I looked at him and I said, "Actually, I was going for four, but they're not twins."

**Voices:** Oh, oh!

**Ms. Karen Low:** That just defused it. I mean, he was a dinosaur and I outlasted him. But yes, you just kind of wanted to say what happened—

**Ms. Saira Muzaffar:** This is what happens. Women are very good at problem-solving on our feet. This is what we do. We get stuck in a certain situation and we will deal with that situation, but we won't turn it into a practice or a recommendation. The recommendation is education and awareness, and it needs to bring in everyone, not just women. Lessons learned—

**Ms. Karen Low:** But you can only pick them off one by one.

**Some hon. members:** Oh, oh!

**Ms. Saira Muzaffar:** You see? Mindsets.

**The Chair:** Thank you very much for that.

Thanks to all of you for your presentations.

[*Translation*]

I thank you also for these thought-provoking words. I find the salary disparities by activity sector very interesting. This may be linked to the priorities we set in our society. I find this compelling. We talked about life sciences. I am an agronomist by training and I chose that field out of passion. But agronomists do not earn the same salary as some people in other sectors.

So I think we have to ponder our priorities. What are they? And how is this reflected in the salaries paid in various professions, regardless of gender?

That is the thought I had as I listened to you, in addition to all of the other thoughts you generated, of course. Thank you very much.

We will get together Thursday for another meeting which I believe will be held at the Valour Building, La Promenade.

Thank you once again and have a lovely day.

The meeting is adjourned.

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