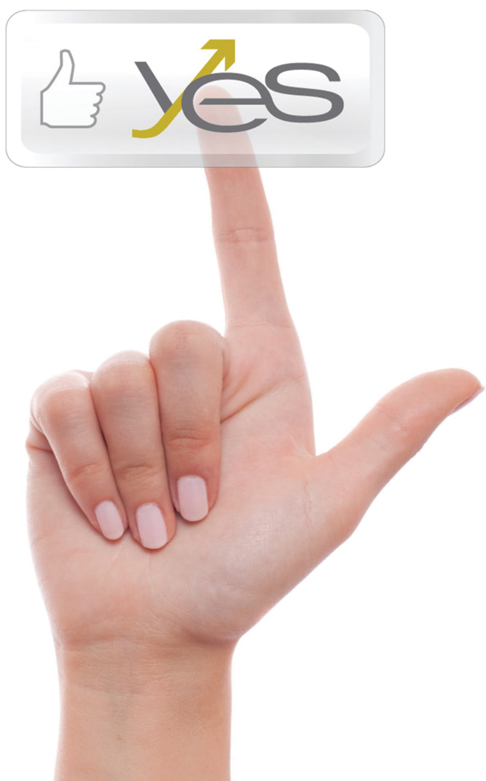
GENDER BASED ANALYSIS:
TECHNOLOGY SECTOR IN QUEBEC

WOMEN IN TECHNOLOGY



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Members of the Advisory Committee include:

- Cathy Nguli, ABB, Montreal
- Chad Loeven, RSA, Montreal
- Daniele Nascimento, McGill University, Montreal
- Elisabeth Laett, IntellaCare & Xaphan Group, Montreal
- Elisabeth Vanderveldt, Robert Half Technology, Montreal
- Liesl Barrell, Unbounce, Montreal/Vancouver
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This research paper does not necessarily represent the official policy of Status of Women Canada.

This report was prepared by Andrea Wood of A2W Consulting.

EXECUTIVE SUMMARY

This paper represents the research component of a larger project focusing on "women in technology", an initiative launched by YES Montreal in autumn 2012. The project strives to build capacity in Montreal's technology sector by applying a gender-based analysis in the advocacy of women's career development in the technology sector. The research will support the delivery of programs focusing on the development, implementation and evaluation of women's careers in technology over a 3-year period, between 2013 and 2015.

The Montreal technology sector faces a pipeline issue. This report aims to improve the understanding of the factors influencing the technology sector's lifecycle, from elements impacting early technology education through career development. Predominantly, the research addresses the issues that prevent women in Quebec's technology sector from achieving their goals. In order to elaborate upon the issues and opportunities, the study relies on two forms of research: secondary research conducted by experts in the field, and primary data collected through surveys, focus groups and interviews.

Landscape: Gender in the Workplace'

The section titled '*Landscape: Gender in the Workplace'* reviews publications highlighting the global challenges facing women in the technology sector. This section explores such questions as: 'What role do cultural norms play in science, technology, engineering and math (STEM) education and workplace diversity?'; 'What limits the involvement of women in technological workplaces?' and 'How can workplace diversity gain the most leverage?'.

Research indicates the environment in which a child is raised shapes the comprehension of gender roles. Young women who show promise in science, computing and math may avoid studying these subjects to ensure social inclusion. A simple decision made by a child to secure peer acceptance goes on to impact a woman's future, shaping her worldview and determining the fields in which she may study.

Over the last 20 years, Canadian women graduating from math, computer science and engineering have declined. These women indicate the bias associated with studying technical subjects and technical workplaces prevents them from fully exploring the opportunities in the field. The promise of excellent compensation is not reward enough; Canadian women seek job satisfaction more frequently than monetary reward.

With a quarter of the Canadian technology workforce and 52% of all Canadian venture-funded companies based in Quebec, the province is a veritable technology hotbed. Yet feedback obtained in this study's focus groups and case studies suggest workplace attitudes and norms prevent women from seeking long-term careers in the sector.

Findings from the Montreal Technology-Sector Study:

Primary data, presented in *'Gender-Based Trends: Findings from the Montreal Technology-Sector Survey'*, (page 25) includes the findings from 546 survey responses, 8 focus groups and 52 interviews. Individuals in professional roles, employment seekers, students and funders were approached for the study, which reached out to sectors, including, but not limited to:

- Software and hardware development
- Gaming
- Ecommerce
- Digital arts
- Biotechnology

The YES Montreal Women in Technology survey, offered online between March 25 – April 25 2013, collected 546 responses. Survey results provided the following insights into education and the workplace:

Education:

Respondents indicated the pipeline issue begins before university. Male students were more likely than female students to study engineering (32% vs. 14%), computer science (27% vs. 16%) and math (7% vs. 1%) at college and university. According to feedback from the survey and focus group participants, university enrollment in science, technology, engineering and math (STEM) is curbed by 'boring' and 'narrow' programming in primary and secondary school. Additionally, early education in Quebec fails to expose the many technology career options available to students upon graduation; the lack of understanding of career options stream students into traditional jobs, effectively thwarting the expansion of the tech sector.

Workplace:

As a result, fewer women are employed in the technology sector. 61% of all Quebec-based respondents in the technology sector indicated their workplace is mostly male. Furthermore, men are more likely to occupy highly technical roles within the technology sector. Women hold the majority of positions in graphic design, marketing, social media and web development, while men hold the bulk of positions in computer programming, engineering, information systems and software development. Women frequently take on traditionally creative and social roles, such as artistic or human resources roles. While the appeal of these roles may speak to a woman's interests, the division provides social reinforcement about which roles women are best suited to fill.

This division of labour does little to dispel gender bias in the workplace. 84% of respondents believe women face adversity in the workplace. According to the survey, workplace policies are required to level the playing field in the tech sector; 90% of respondents state equitable hiring policies are important to ensure women are integrated into the workplace.

Despite these beliefs, significant disconnects exist between what men and women believe about equity in the workplace. 60% of men believe salary inequities have improved over the past 10 years, while only 47% of women agree with the same statement. 63% of women believe “Men are more frequently promoted than women”, while 61% of men disagree. Both genders lack clarity on how their colleagues are compensated and how they are chosen for promotion.

Traditional gender biases add a layer to divisions of labour in the technology workplace. 77% of women stated they are asked to do administrative tasks outside the scope of their daily work, such as taking notes at meetings, ordering food or organising events. This type of gendered activity marginalises women, even those in senior roles.

These biases are self-perpetuating. Women must speak out to gain recognition for their work in order to advance. However, 69% of all respondents indicated women do not promote themselves or their skills. 75% of women believe women do not self-promote in the workplace, out of lack of confidence or the fear of appearing too boastful.

Much of the adversity experienced in the workplace could be overcome with the support of a network or role model. Female role models, who lead by example, help women make decisions, deal with workplace feedback and negotiate through conflict. However, 69% of women indicated that role models and mentors are lacking in the workplace.

SUMMARY OF RECOMMENDATIONS

As Canada's hotbed for venture capital investment and technology start-ups, Quebec presents ample opportunity for employment in information and communications technology (ICT) roles.

However, women in science, technology, engineering and math (STEM) roles in the sector are lacking. With 19 universities in Quebec (several specialist STEM universities in Montreal) and access to affordable education, the requisite infrastructure to train for a role in the technology sector exists. Still, roles in ICT are dominated by men. When women take on roles in technology companies, they largely favour soft-technical occupations (business, product management, marketing and writing) within corporate environments. Women with children are supported by a social system that provides paid parental leave (for both women and men) and affordable childcare. Yet, despite an infrastructure that works to facilitate a woman's success, women enter the tech sector less frequently than men. Furthermore, they exit the sector – almost predictably – after years 6-10.

The issues that prevent entry to the sector and trigger the desire to leave are numerous and wide reaching. Ranging from educational curriculums that favour boys to a workplace culture built on bias, women are virtually set up for failure in the technology sector.

The combination of the literature review and the primary data collection indicates the following issues should be addressed:

- An inclusive approach to math and science programs at the primary school level must be taken to increase interest and appeal of the subjects
- Introduce science, technology, engineering and math (STEM) careers early in high school, providing students with ample opportunity to acquire pre-requisites prior to researching university programs
- Demystify technical roles. Expose the opportunities to combine creative and social capabilities with technical development.
- A whole-life approach to sensitivity training, where the value of male and female opinion is emphasised in education and in the workplace
- Availability of mentorship to support aspiring women in technology. Partnerships with successful women or cooperative men can provide affirmation to developing professionals in search of guidance
- Introduction of workplace flexibility, such as job sharing, for parents who wish to spend time in the workplace and on personal obligations

WIT RECOMMENDATIONS

The combination of the literature review and the primary data collection indicates the following issues should be addressed in the Quebec market:

Provide a welcoming educational environment:

- Provide equal opportunities for girls and boys to learn about STEM. Each child learns differently; educational options must exist that appeal to the interests of every child.
- Build confidence in STEM at an early age. Provide girls and boys alike with the opportunities to learn about functioning technology in an 'unbreakable' environment. Provide real world problems and encourage creative solutions.
- Enable children to build their own solutions. Tear down the pre-requisite barriers that prevent creativity. Allow children to understand 'how things work' and school curriculums are not one in the same.
- Identify teachers and parents with unique educational and work experiences, and encourage them to share with children. Allow children to see the path to STEM careers is varied and interesting.
- Create in-school mentorship programs; allow children interested in STEM to interact with like-minded adults employed in the sector. Create a reassuring and motivating relationship that will allow a child to see a wider perspective on the sector.
- Employ open-minded guidance counsellors, equipped with the knowledge to inform children of the many programs and careers that allow for use of traditional degrees in non-traditional roles.

Break down cultural stereotypes:

- Establish the importance of ICT careers. Show children from an early age the potential impacts of ICT. The sector promises the opportunity to do well and to earn an excellent salary.
- Ground the sector in everyday tasks. Show how the world is built on technological solutions, and how everyone can lend a hand in contributing to the solutions.
- Demonstrate the value of building relationships, solving problems and learning as a team. ICT is best served when varying points of view work together to reach a common goal. Modern ICT solutions are not developed in isolation; they meet the needs of many parties.
- Work with industry to make ICT more inclusive. Eliminate exclusionary behaviours and attitudes that rank ICT roles, making some seem less valuable than others.

Level the playing field in the workplace:

- Focus on diversity as an opportunity for change. Hiring and training individuals from non-traditional backgrounds adds a new perspective and point of view that may make problem solving more effective.
- Integrate skilled immigrant women into Quebec's technology workforce. Barriers to integration, including a lack of equivalencies for education, workplace training and experience, prevent skilled newcomers from finding gainful employment. Integration of these women helps resolve labour shortages in the technology sector, and adds to the diversity of workplace problem solving.
- Provide training and development for soft skills in STEM workplaces. Place an equal value on product development and personal development. Well adjusted team members are more productive and cooperative team members.
- Encourage pay equity.
- Encourage formal and informal relationships to encourage women's career development. Mentors that help women navigate through their careers help provide a sense of normalcy and balance. Outside perspective provides a second opinion, and years of workplace expertise.
- Create a workplace culture that encourages the re-integration of mid-career women post childbirth. Offer alternatives that allow both employer and employee to benefit, such as teleworking, part-time work and job-sharing. All requires communication and teamwork, a testament to encouraging a shift in workplace culture.
- Judge performance based on output, not workplace presence. Parents and people with personal commitments may not spend 12 hours a day in the office. They, however, may complete their work at home. Discourage the chaotic pace of work in the office; reward task completion – regardless of location.
- Host inclusive workplace events that all employees can enjoy.

Encourage entrepreneurship:

- Provide training and funds to support female-led start-ups. Allow women to feel they are competing on even ground.
- Provide access to information about setting up a small technology business. This should range from business planning, accounting to legal and HR issues.
- Support mid-career women and those with families in the pursuit of technology career aspirations. This could include re-entering the workforce in a new capacity or starting a small business.
- Create mentorship programs and networks specifically for female entrepreneurs in technology. Allow women to learn from one another, and access a forum for exchange and support.

- Develop a female-focused Quebec-based funding and accelerator program. Teach women to pitch their business ideas, expand their businesses and find growth solutions appropriate for their businesses and lives.

YES RECOMMENDATIONS

The WIT recommendations provide the basis for YES Montreal's WIT program. Actionable items include:

- Create an Advisory Committee to stimulate female-specific start-up initiatives. Said Committee should include finance specialists, who may highlight the issues associated with demographic-specific funding. The Committee would address the specific needs of female led start-ups.
- Assemble a group of Quebec educators to form an Advisory Committee on the state of women's technological education in Quebec. Said committee should include members of faculty at the primary, secondary and post-secondary levels to discuss issues addressed in the GBA.
- Introduce a Networking and Pitching workshop specifically for women in technology. Ensure counselling and coaching at YES to train women to communicate and promote their competencies and experience more readily.
- Establish and promote successful women with technology careers in Quebec. Create and circulate documentation highlighting a range of women, from entrepreneurs to corporate career women. Demonstrate the breadth and diversity of women in the Quebec technology market.
- Implement a WIT mentorship program. Match female job seekers and entrepreneurs with Quebec-based business professionals.
- Offer networking events and workshops to allow women in technology and female entrepreneurs to connect. Access to support networks allows women to address challenges and share their experiences in a non-judgmental environment.
- Raise awareness within Quebec about the challenges facing women in the technology workplace.

INTRODUCTION: OBJECTIVES AND METHODOLOGY

This report aims to improve the understanding of the factors that prevent women in Quebec's technology sector from achieving their employment goals. In order to elaborate upon these issues and opportunities, the study relies on a literature review and primary data collection to create a holistic picture of the Quebec technology sector.

Methodology

The methodology outlines the approach to collecting information for the literature review, identifying and interviewing subjects for case studies, conducting the focus groups and collecting quantitative data from the survey.

Literature Review

The literature review identified and reviewed HR, labour market and sociological studies and surveys from Canada and around the globe. Steps included:

- Identification of issues facing information, communication and technology (ICT) sector, particularly female recruitment and retention
- Identification of programs, resources, outreach strategies, promotional campaigns and career development tactics and their impacts
- Focus on the issues facing entry and retention with the ICT field

Themes identified in the literature review were used to develop interview and focus groups questions.

Online Survey

The survey consisted of thirty-two demographic and sociographic questions. The survey was circulated throughout YES's clientele, WIT Advisory Committee member's professional networks, and a variety of personal networks. In total, the survey reached 546 people from around the world. Data was refined to isolate respondents from Quebec, to address respondents from male and female respondents, and to identify gaps between the technology sector and the soft-technical sectors in Quebec.

Focus groups

The focus groups were designed to gather information on the perceptions and views held by women employed in the technology sector in Quebec, or women who wish to enter the sector. The facilitator led a relaxed discussion guided by broad open-ended questions and themes to encourage the participants to interact and share their ideas and perspectives. The focus groups were particularly helpful in adding depth and clarity to the quantitative results. Trends, popular opinion and reactions to specific programs, services, products or sectors were extrapolated from focus groups. Finally, the focus groups lead to further research questions or hypotheses.

The YES Montreal WIT Study identified the following parties for participation in focus groups:

- Secondary school students
- Post-secondary students
- Unemployed adults
- Women previously and currently employed in the IT sector
- Entrepreneurs

The facilitator prepared guiding questions, contacted prospective participants, facilitated the focus groups, took comprehensive notes and compiled, synthesised and analysed the data.

The study includes the feedback from eight focus groups, consisting of a total of 51 female participants.

Case Study Interviews

In an effort to address key industry concerns and cover as much ground as possible, YES Montreal, the WIT Advisory Committee and key members of the Montreal technology sector contributed the names of persons of interest for interviews.

Stakeholders included members of, but were not limited to, the following domains:

- Software and hardware development
- Gaming
- Ecommerce
- Digital arts
- Biotechnology

Following the identification of stakeholders, introduction emails were dispatched to explain the project and to invite each stakeholder to participate.

- Each stakeholder was contacted by telephone and/or sent advance documentation outlining the goals of the project and inviting their input.
- In-depth interviews were conducted in person, by telephone or by Skype.
- Data was compiled, synthesised and analysed for patterns, trends and key findings to complement, illustrate and/or extend results of the literature review.

Interviews included 52 stakeholders throughout Quebec, Canada and the United States. 41 of these stakeholders were women, 11 stakeholders were men.

LANDSCAPE: GENDER IN THE WORKPLACE

This section explores the international knowledge base established on women in technology. In recent months, the topic has featured widely in mainstream media. From Sheryl Sandberg's best-selling book "Lean In" to articles in Forbes and Wired, the issues facing women in technology are no longer 'on the fringe'. These issues are frequently discussed, debated and defended.

This literature review highlights selected studies and articles about labour force activity, the technology sector and social trends. Sections include:

- Global trends in technology employment
- Perceptions about technology and gender
- Technology education
- Technology careers
- The Canadian perspective on the technology scene
- Quebec perspective on the technology scene

STEM vs. ICT

STEM:
A widely used acronym for fields of study including Science, Technology, Engineering and Math. These fields include chemistry, computer and information technology science, engineering, geoscience, mathematics, physics, and astronomy.

ICT:

A commonly used acronym for Information and Communication Technology. The term stresses the role of unified communications, computer systems, software, etc that enable access, storage, manipulation and transmission of information.

The underrepresentation of Women in Science, Technology, Engineering and Math (STEM) roles plagues industry, academia, not-for-profits and government alike. The imbalance between men and women in STEM is rooted in the very fabric of society, ranging from cultural bias to educational norms to workplace priorities

The lack of women in technology runs the gamut of the lifecycle, often called the 'pipeline issue'. As part of a greater literature review on the global experience of Women in Technology, this section asked the following questions:

- What role do cultural norms play in education in STEM and workplace diversity?
- How do children learn about career opportunities?
- Who limits the involvement of women in technological workplaces?

- Where does tech workplace diversity gain the most leverage?
- How have workplace circumstances changed in STEM since the inception of the women's liberation movement?

Cultural Perceptions

Gender roles are established early, and stay with children throughout their lives. Initially, these innocuous roles help children frame their worldview and to understand their environment. These worldviews, perpetrated without ill will or ill intent, help to shape future generations.

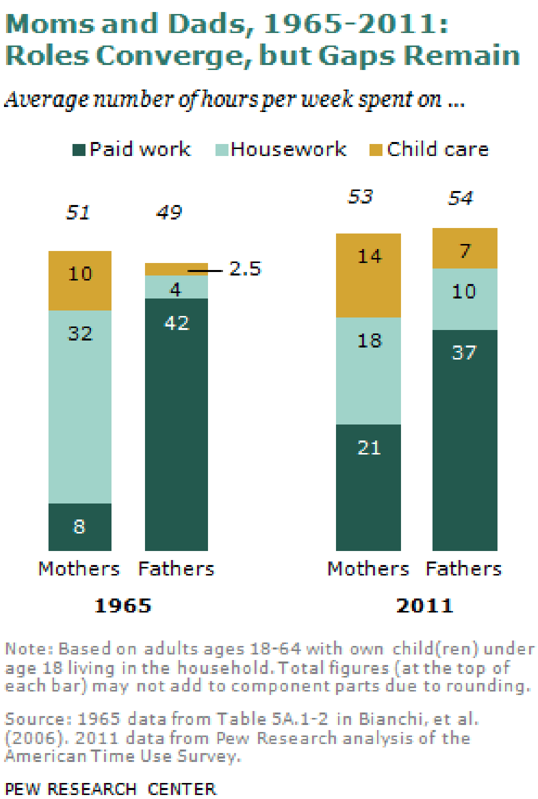
A social experiment conducted in an American primary school asked Grade 1 children to wear a sticker containing the name of a 'job' on their back. Other pupils were asked to describe the career. When boys learned they were labeled 'teachers' or girls learned they were labeled 'plumbers', they were taken aback. "A boy doesn't TEACH!".[1] This type of reaction influences other students in the class, their choices and their aspirations. By learning about societal roles at an early age, children unconsciously alter their intentions. Prolonged exposure to messaging about appropriate roles eventually alters a child's understanding of their potential.

Since children shape their worldview based on the messages to which they are exposed, the media and companies selling products enjoyed by small children play an important role in this definition. In early 2013, Hot Wheels, a subsidiary of Mattel, held an event to explain why children (specifically boys) play with toy cars. According to a VP at Mattel, "Mom doesn't get why cars, engines, and all the shapes and crashing and smashing are so cool". [2] Mattel also launched a Hot Wheels website dedicated to Moms to describe the benefits of vehicles, tips on playing with cars and using them to teach science and math. While attempting to foster a mother's understanding of her child, the company also assumes that the same techniques could not be adopted with a girl. Mattel, the producer of Barbie, sets behavioural expectations at a very young age. This universal approach to brand development may benefit the company, but neglects consideration of the 50% of the population who may also be interested in cars, math and science – and not in dolls.

Well-intentioned activities, like those sponsored by Mattel, can have unfortunate consequences. By creating an awareness of stereotypes, they are effectively setting a stereotype in stone. By countering a stereotype, tolerance from diversity can start at a young age.

The environment in which a child is raised also impacts the child's perception of gender roles. In a traditional environment, where a mother is ascribed domestic duties, the child believes that this is the norm. As a mother seeks work outside the home, a child's perception will also shift.

FIGURE 1.1 AVERAGE NUMBER OF HOURS PER WEEK SPENT ON PAID WORK, HOUSEWORK AND CHILD CARE[3]



According to Pew Research Center, the number of hours Mothers spend outside the home doing paid work has more than doubled since 1965.[4] In 2011, Mothers spent 21 hours per week outside the home doing paid work. Alternatively, the amount of time fathers spent on housework and childcare has almost trebled as reflected in Figure 1.1. Combined, these two factors shift the general consensus about the roles that female and male parents play at home and in the world.

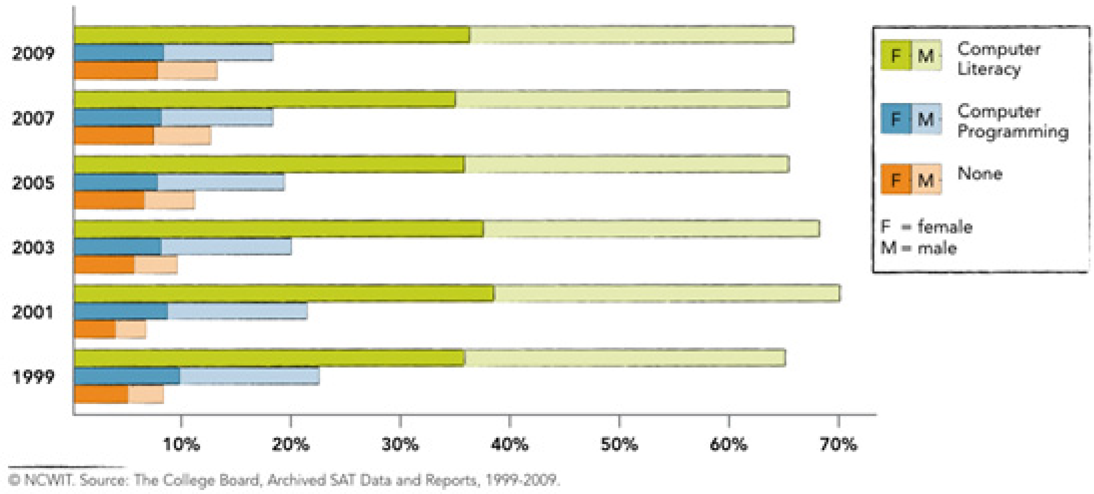
Education

Despite changes in perceptions about roles in the home, stereotypes abound around the study and employment in technology. Fear of a 'geek' stereotype impacts young people's willingness to study technical subjects. In formative adolescent years, when social perception can outrank the importance of education, avoiding bias at all costs outranks the value of learning about technology.[5]

From an early age girls obtain higher grades and are less likely than boys to repeat a year.[6] Despite a demonstrated ability to learn, girls less frequently engage on science, engineering and technology paths. Boys opt less often for studies in education, health and welfare and the humanities.[7]

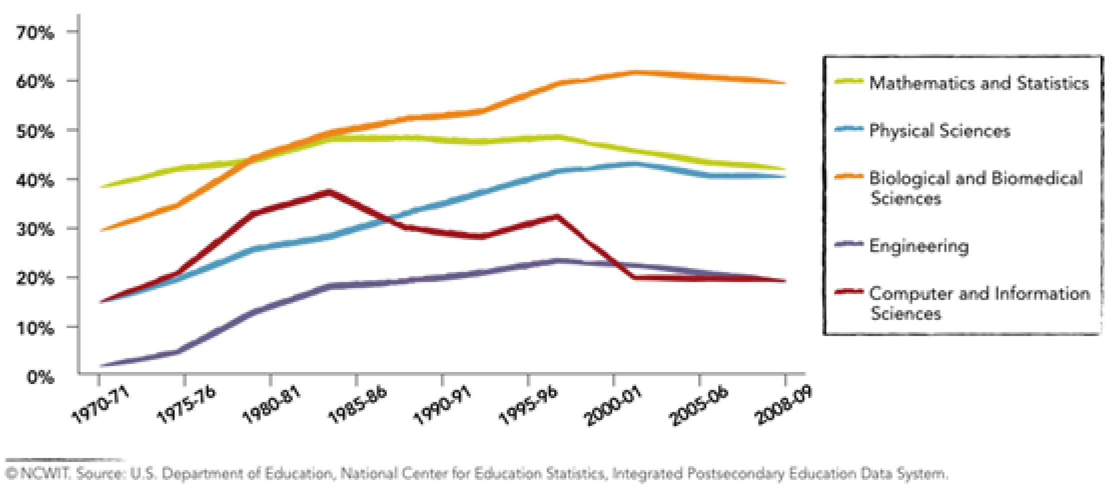
This phenomenon is reflected in a consistent failure for girls to learn about technology. Between 1999 and 2009, little change occurred in the number of female students learning about computers at school. Of 1.5 million US students surveyed by The College Board, more than 60% of high school students reported no computer-based coursework.[8]

FIGURE 1.2 PERCENTAGE OF STUDENTS REPORTING COMPUTER COURSEWORK/EXPERIENCE IN HIGH SCHOOL, 1999-2009[9]



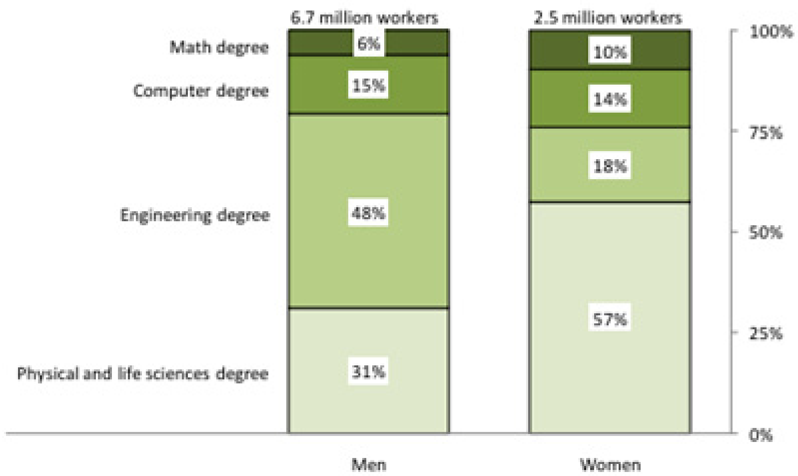
Accordingly, 18% of undergraduate computer science degrees were earned by US women. [10] This number dropped by more than 12% from the 1980s, when over 30% of computer science degrees were earned by women. The study of engineering, however, has been on the rise since the early 1980s; women now receive 18% of all engineering degrees in the US. [11]

FIGURE 1.3 FEMALE PERCENTAGE OF SELECT STEM UNDERGRADUATE DEGREE RECIPIENTS[12]



STEM studies at the undergraduate level are only the starting point on the academic ladder. While women have earned 40% of STEM degrees for some time, their levels drop off by 20% at each rung of the academic ladder. In science and engineering, women make up half of all graduate students and post-doctoral fellows, 41% of the assistant professors (pre-tenure), 34% of associate professors (post-tenure), and less than 20% of full professors. Women comprise only 8% of engineering professors.[13]

FIGURE 1.4 COLLEGE-EDUCATED WORKERS WITH A STEM DEGREE BY GENDER AND STEM DEGREE BY FIELD, 2009[14]



Source: ESA calculations from American Community Survey public-use microdata.
Note: Estimates are for employed persons age 25 and over. The shares for men and women do not add up to 100% due to rounding.

Perhaps the biggest factor in involving girls in technology education is the environment in which they learn. A male-oriented curriculum in STEM classes causes women to feel a lack of support, from the male academics who design the courses and male peers with whom they study.[15] Girls may be turned off by the assigned work or the students, and as such, may not study computing until university.

Female students in North America are more attracted to disciplines with “social purposes”. Many women articulate an interest in “computing with a purpose” as opposed to “hacking for hacking's sake” and are more interested in the application of technology than “the technical bits”.[16] Women believe STEM courses are boring and difficult; research show that those women who chose a STEM degree do so for professional security rather than out of love for the topic.[17]

Market research firm Youthography surveyed Canadian students between the ages of 17 and 20 and found that only 36.3% were interested in pursuing a career in ICT. Of those who were not interested in computer science, 35% cited “it’s boring” as the top reason. Among the female respondents who participated in the survey, only 28% were considering a career in ICT, despite 75% of them claiming to be proficient with computers in their daily lives.[18]

Once studying within a STEM faculty, the lack of a support within the faculty combined with a sense of isolation stems from the abrupt withdrawal of familiarity, encouragement and reassurance. This lack of community results in a loss of self-confidence, making women particularly vulnerable to switching programs.[19]

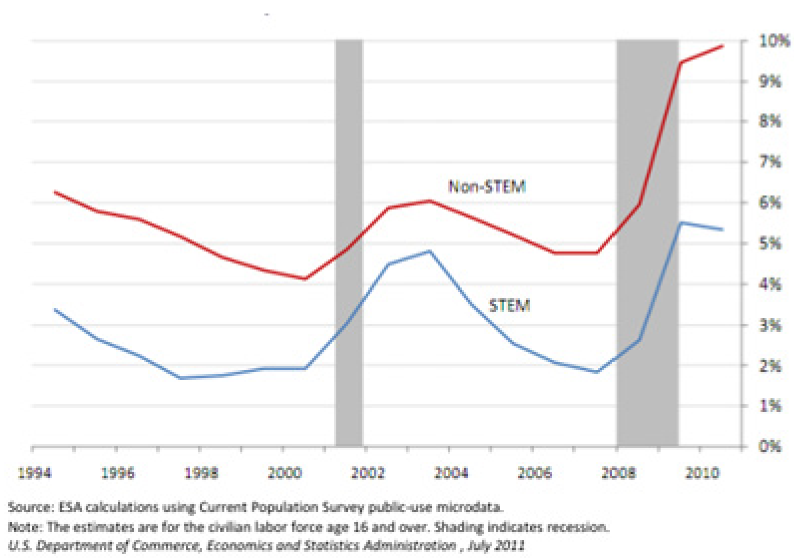
Career

While women make up 48% of the U.S. workforce, they represent only 24% of the STEM labour force. [20] By the same token, the EU workforce relies on women for 46% of union's total workforce.[21] Only 30% STEM workers are women.[22] Perhaps more surprisingly, only 4 out of 29 women holding a STEM degree in Europe actually work in the field. [23]

Experts postulate a long list of reasons for the imbalance in the global technology workforce. Salary inequity is a considerable source of dissatisfaction for women in the tech sector. STEM jobs tend to offer greater pay – 26% higher than the US National average.[24] However, women still receive salaries 24% lower than their male colleagues. [25]

While the potential for higher salaries and lower unemployment rates should seem appealing, STEM roles still manage to turn women away after several years in the workplace.

FIGURE 1.5 UNEMPLOYMENT RATES IN STEM AND NON-STEM OCCUPATIONS, 1994-2010[26]



Workplace politics and other exclusionary behaviours limit social interactions and thereby limit career development. 65% of women in technology experienced exclusionary cliques while employed by a large corporation. [27] Negative workplace experience impacts job satisfaction, creating the perception that gender prevents workplace fit.

Another factor attributed to low technology workplace diversity is the struggle to combine career management with long-term career with family obligations. 77% of women reported experiencing difficulty balancing work and family obligations.[28] Anecdotal evidence also shows that opportunities for re-integration into the workforce post childbirth are lacking. The time required to care for a family and manage a high-pace technology career prevents some intelligent and skilled professionals from fulfilling their career objectives. This also blocks industry from benefiting from diverse and varied knowledge bases.

The tech industry, specifically start-ups, places primary focus on success. With 55% of start-ups experiencing failure by year 5,[29] many new enterprises believe they cannot afford to think about issues not central to business success. In many cases, a business may be unable or unwilling to put the time, effort and money into leveling the playing field in the workplace. Alternatively, many women with families do not have the flexibility to risk career development and salary in tech start-ups.

According to The Athena Factor, over 52% highly qualified females in science, engineering and technology roles quit their jobs.[30] Driven out by hostile environments and extreme job pressures, the exodus of female talent has been a problem from the inception of the women's liberation movement. As family pressure increases, so too do the career hurdles in many women's lives.

Dr Veronica Dahl, a computer scientist considered a founder of the field of logic programming, describes her experience as 'polite discrimination'. Since her entry into the field in the early 1970s, Dr Dahl has faced pay inequity, childcare bias, and sexism. In 1984, her employer refused to reimburse a $17 childcare expense; an expense she incurred while speaking out of town on their behest. In 1997, her employer discovered male faculty earned $10,000 a year more than female faculty. After two years of studying her specific case, she received a significant raise, retroactive to the initial review. Her pension was never adjusted for the years of being paid less than her male peers. Dr. Dahl's personal history shows how one woman fought against gender bias for over 30 years, while also reaching the top echelons of her field. "While we've addressed some problems, over all we're not that much better."[31]

Canadian Perspective

According to Statistic Canada, women make up 50.4% of the Canadian population.[32] These women are among the most educated in the world; 34% of Canadian women hold university degrees while 37% hold post-secondary diplomas. [33]

Despite the prevalence of technology in education, from tablet computing to use of electronically indexed library systems the number of Canadian women graduating in STEM programs has declined 5% since 1992. [34] In 2008, women made up 30% of all Canadian graduates in math, computer and information sciences. [35]

Even with women graduating from STEM programs, 3.3% of Canadian women are working in the field of math and engineering. 7% of all Canadian women are managers. [36]

FIGURE 1.6 UNIVERSITY GRADUATES BY FIELD OF STUDY[37]

Field of Study	Median Income		Median Income	
	25 – 29		30 - 34	
	Women	Men	Women	Men
Math, computer and information sciences	$44,745.00	$47,987.00	$53,090.00	$62,227.00
Engineering and related services	$47,977.00	$52,175.00	$55,027.00	$65,821.00
Business, management and public administration	$41,728.00	$46,539.00	$50,250.00	$64,883.00
Social and behavioural sciences	$38,402.00	$41,448.00	$47,303.00	$56,000.00

Wages paid to STEM graduates are notably higher than those received by students of social sciences and business. The wage gap grows within 10 years of graduation, but is also accompanied by gender inequity. Women with the same education frequently make more than $10,000 less a year than a male peer. [38]

Part of this gap may stem from the realities of family life for women and men in their 30s. In 2009, 2.2 million Canadian women worked part-time 27% of the population work fewer than 30 hours a week. According to Statistics Canada, “most women who work part time do so either because they do not want full-time employment or because part-time work is more appropriate for their personal situation.” Part-time work allows women to re-integrate into the workforce, contribute to the family purse and provide childcare. It may also contribute to lower wages and may impact career progress. [39]

Women account for only 28.1% of ICT workers in Canada. (In some regions, women account for a higher proportion than in others; e.g., 32.6% in Newfoundland compared to 25.1% in Manitoba). As shown in the following table, women employed in ICT are concentrated in soft-technical occupations.[40]

FIGURE 1.7 FEMALE PARTICIPATION IN 14 ICT OCCUPATIONAL GROUPS IN THE PRIVATE SECTOR, 2007[41]

Writers	74.3%	Trainers	21.2%
Graphic Designers and Illustrators	60.8%	Managers	19.6%
Analysts	36.8%	Programmers	16.7%
Support	29.9%	Operators	15.5%
Data	25.7%	Technicians	14.8%
Project Managers	24.9%	Software Engineers	13.0%
Multimedia Developers	21.3%	Engineers (except software)	9.0%

Self-employment often meets the needs of women interested in fulfilling their career and monetary requirements without the restrictions posed by full-time employment. 11.9% of women with jobs are self-employed. [42]

Performing work that matches with one's values was cited both in the literature and in the focus groups as paramount. Consulting and self-employment were presented as a mechanism for gaining control over the work content and environment. Workplace ethics, organisational culture, benefits and social and equity policies have enormous impact on the retention of women in the IT workplace, especially for women mid-career who have or may be considering having a family.

Immigrants play an important part in the Canadian workforce, specifically in STEM disciplines. While 5% of Canadian-born female students graduate in engineering, math or computer/information science, 11% of immigrant female graduates hold the same degrees. Immigrant women currently hold 8% of IT jobs in Canada.[43] The Information and Communications Technology Council (ICTC) estimates that 106,000 ICT jobs will need to be filled by 2016. With an annual hiring rate of 17,000 and too few employees trained in Canada, immigrant women will play an important role in gender and workplace diversity in Canada.[44]

15% of ICT workers immigrated to Canada; that the percentage of internationally educated professionals working in ICT is higher than in other Canadian occupation. [45] Trainers (24.6%), programmers (17.7%) and software engineers (12.4%) are more likely to be landed immigrants.[46]

FIGURE 1.8 MAJOR FIELD OF STUDY, PERSONS 15+ WITH POST-SECONDARY CREDENTIALS, CANADA, 2001[47]

	Immigrated 1991-2001	Canadian-born
Number with post-secondary qualifications	772,700	7,934,370
Physical Sciences, Engineering and Trades	42.7%	32.8%
Agricultural and Biological Sciences	5.1%	4.6%
Engineering, Applied Sciences and Trades	27.6%	25.4%
Physical Sciences and Mathematics	10.0%	2.8%
Health Professions, Sciences and Technologies	9.4%	11.3%

However, foreign education sometimes acts as a barrier rather than a point of entry for immigrant women. While these women may offer great potential to the workforce, their credentials are frequently not recognised in Canada. These individuals enter the workforce in alternative or more junior positions in an attempt to qualify for the Canadian workforce. The workforce is dependent on the immigrant population for knowledge and skill.

Quebec Perspective

Quebec plays a significant role in Canada's ICT sector. 5% of Quebec's employment comes from jobs in the sector, while the province's ICT employees make up approximately 25% of the national ICT workforce.

The bulk of the province's ICT workers are located in Montreal, with a further 10% in Ottawa-Gatineau. More than 40% of provincial public sector IT workers are based in the province of Quebec.[48]

FIGURE 1.9 PERCENTAGE OF OVERALL WORKFORCE AND IT WORKERS BY REGION IN CANADA[49]

	% of the full-time Canadian workforce in 2006 (Statistics Canada, 2006)	% of all workers that are IT workers (Wolfson,2006)	Unique factors
Canada	100%		
Atlantic	6.6%	5%	More technicians
Quebec	22.8%	23%	High percentage of public servants; fewer engineers
Ontario	39.3%	49%	More engineers; more analysts
Prairie	18.3%	13%	Fewer engineers
BC	13%	11%	Fewer analysts

According to the Information and Communications Technology Council, Quebec's ICT sector includes businesses that supply information technologies as well as firms that develop and publish software. These verticals include:

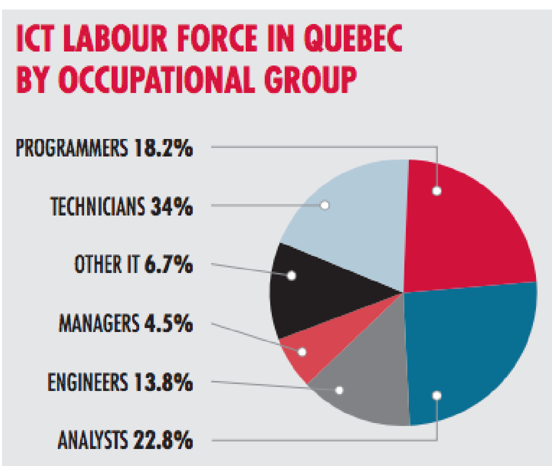
- Resource management

- E-business
- Customer relationship management
- Computer security
- Knowledge management
- Supply chain management

Businesses that provide information technologies are active in numerous fields, including healthcare, manufacturing & logistics, finance, and public administration. The offerings and size vary greatly, making for a dynamic and innovative industry. Over 350 firms develop and publish software in Montreal alone, generating $1.2 billion in annual revenues and employing over 6000 people. [50]The gaming sector and help desk operations support the majority of employees in the sector.

Particularly in the gaming sector, multinational companies frequently ask employees of international origin to join their project teams in Quebec. This trend, accompanied by a strong base of internationally education professionals, means 52,000 ICT workers in the province were educated outside Quebec. [51]
The ICT labour force in Quebec is dominated by technicians and analysts. The strong contingency of government ICT workers contributes to this trend. Programmers and engineers make up a little over 30% of the ICT workforce, while information architects, systems administrators and other ICT professionals make up 7% of the labour force.

FIGURED 1.10 ICT LABOUR FORCE IN QUEBEC BY OCCUPATIONAL GROUP[52]



According to ICTC, Quebec is constantly seeking computer programmers, technicians, electrical engineers and graphic designers/illustrators. This demand for skilled ICT professionals provides ample opportunity for employment to industry new comers.

The strength of province's ICT sector is, in part, due to the subsidies provided by the provincial government. The Government of Quebec's Innvatech initiative committed $80 million in funding to tech companies, while partners promised $100 million to help set-up a tech fund and accelerator, create centres of excellence and instate outreach initiatives to attract investment and interest from Europe. [53]

The favourable provincial environment has also made Quebec Canada's investment centre for venture capital. 52% of Canadian companies financed by VCs are located in Quebec. Investissement Quebec states that $432 million in funding is injected into 159 Quebec-based companies by VCs.[54] According to Reseau Capital, 2012 VC activity reached $409 million; 58% of these investments were receiving VC funding for the first time.[55]

This investment provides important stimulus to the Quebec economy. By creating a wealth of technology sectors jobs, the province effectively creates a centre of excellence where technological creativity and entrepreneurship is encouraged.

GENDER-BASED TRENDS: FINDINGS FROM THE MONTREAL TECHNOLOGY-SECTOR SURVEY

Overview of Survey Respondents

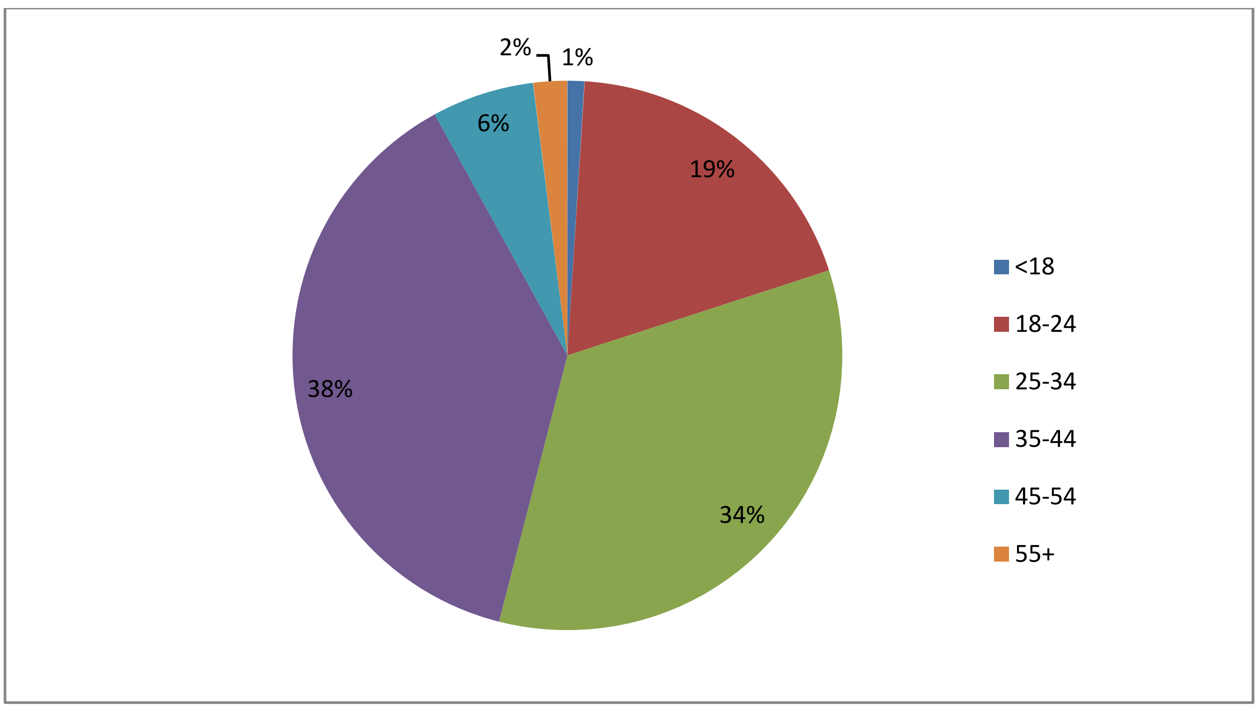
Between March 25 – April 25, 2013, the YES Montreal Women in Technology online survey collected 546 responses.

The survey reached:

- 79% women
- 20% men
- 1% transsexual

In an effort to reach studying and working members of the technology community, the survey was distributed through personal and professional networks, educational networks and professional associations.

FIGURE 2.1: SURVEY RESPONDENTS – AGE



n = 546
Source: YES Women in Technology online survey, April 2013.

People studying science, technology, engineering and math (STEM), working in technology and aspiring to careers in technology responded to the survey. 19% of participants were aged 18-24, 34% were 25-34, 38% were 35-44and 8% over the age of 45. As such, the majority of respondents are likely to be engaged in the workforce.

Respondents by location

Of 546 total respondents from around the globe, 474 (87%) originated from the Province of Quebec. Those respondents who indicated their city of residence within Quebec are based in:

FIGURE 2.2: SURVEY RESPONDENTS – QUEBEC, PROVINCE OF RESIDENCE

#	LOCATION
412	Montreal
13	Quebec City
11	Sherbrooke
18	Gatineau
20	Other

N = 474
Question: City of residence, responses from Quebec
Source: YES Women in Technology online survey, April 2013.

Immigration and Quebec's Technology Workforce

Immigration to Quebec plays an important role in the development of the province's technology workforce. 218 respondents indicated they were born in Quebec, while 147 respondents indicated they were born in Canada, but outside Quebec. 30 of the respondents *living in Quebec* indicated they were born in the US, 75 were born in Europe and 42 were born in Africa, South America or Asia. 34 respondents declined to respond about their birthplace.

FIGURE 2.3: SURVEY RESPONDENTS - OCCUPATION BY BIRTHPLACE

Birthplace	Science, Technology, Engineering and Math (STEM) role within Technology Industry	Soft-Technical Role within Technology Industry
Quebec	39%	40%
Rest of Canada	12%	25%
USA	14%	8%
Central & South America	4%	6%
Europe	22%	13%
Africa	0%	6%
Asia	2%	2%
Oceania	7%	0%

n=546
Question: Birthplace
Source: YES Women in Technology online survey, April 2013.

The role of immigrants to the Quebec technology workforce is of note. 61% of the science, technology, engineering and math (STEM) and 60% of the soft-technical workforce employed in the technology sector indicated they were born outside of Quebec.

The survey responses indicated the technology workforce relies heavily on non-native Quebecers for roles in computer programming (60%), information architecture (70%), and software engineering (55%).

Make-up of the Technology Sector

During the focus groups conducted as part of the Women in Technology study, participants debated which roles in the technology sector merited 'STEM' and 'soft-technical' status. For the most part, roles in art, marketing, project management, social media and SEO were deemed soft-technical, despite the need for technical knowledge. While these soft-technical roles do not contribute to the development of a product, these roles are enabled by technology to assist with the successful launch and sale of a product.

FIGURE 2.4 FOCUS GROUP RESPONDENTS – DEFINITION OF HARD-TECH AND SOFT-TECH

Hard- Tech Role	Soft-Tech Roles
Aerospace engineer	Animator
BI/Database analyst	Artist
Biologist	Audio design
Chemist	Business, finance and administration
Civil engineer	Graphic design
Computer engineer	Human resources
Computer programmer	Marketing or advertising
Front End developer	Operations
Information architect	Producer
Information systems analyst	Product management (software)
Interactive media developer	Project management
Mathematician	SEO
Mechanical engineer	Social media
Physicist	Technical marketing
Product management (aerospace, biotechnology, hardware, material science, telecommunications)	Web analytics
Quality Assurance	Web developer
Software designer	
Software engineer	
Systems administrator	
Technical Support	

Question: What roles do you consider 'hard-tech' and 'soft-tech'?
Source: YES Women in Technology focus group feedback, February-April 2013.

The bulk of respondents indicated they are currently employed in the technology sector. Respondents were broken into two segments: those employed STEM positions; and those employed in business, design, marketing or writing positions.

62% of survey respondents indicated they are currently working in technology careers, either in STEM or soft-technical roles. 16% of respondents indicated they are technology sector entrepreneurs, while 5% indicated they are employed by a technology start-up.

FIGURE 2.5 SURVEY RESPONDENTS - DESCRIBE YOUR SITUATION

Career situation	STEM	Soft-Tech
I have a career in technology	38%	23%
I am aspiring toward a career in technology	2%	7%
I am studying toward a career in technology	3%	1%
I am self-employed in a technology start-up	9%	7%
I aspire to have my own technology start-up	3%	2%
I am employed by a technology start-up	0%	5%

n=546
Question: Describe your situation
Breakdown by career situation within the technology sector; excludes respondents not employed in the tech sector.
Source: YES Women in Technology online survey, April 2013.

Survey results indicate that 55% of technology sector jobs are held by STEM employees, while 45% of jobs are occupied by Soft-Technical employees.

TABLE 2.6: SURVEY RESPONDENTS - YEARS IN OCCUPATION

Years in Sector	STEM	Soft-Tech
<2 years	7%	12%
2-4 years	4%	4%
4-6 years	2%	3%
6-10 years	8%	7%
>10 years	34%	19%

n=546
Question: Years in occupation
Breakdown represented as a percentage of the whole technology sector.
Source: YES Women in Technology online survey, April 2013.

Table 2.7: Survey Respondents – STEM Employees - years in occupation

Years in Sector	STEM
<2 years	13%
2-4 years	7%
4-6 years	4%
6-10 years	15%
>10 years	61%

n=300
Question: Years in occupation
Breakdown represented as a percentage of the STEM employees in the tech sector.
Source: YES Women in Technology online survey, April 2013.

61% of survey respondents in *all STEM roles* indicated they have worked in the sector for more than 10 years. The sector is also being replenished by new employees; 13% of STEM employees have worked in the sector for less than 2 years.

Table 2.8: Survey Respondents – SOFT-TECH Employees - years in occupation

Years in Sector	Soft-Tech
<2 years	26%
2-4 years	9%
4-6 years	7%
6-10 years	16%
>10 years	42%

n=246
Question: Years in occupation
Breakdown represented as a percentage of the Soft-tech employees in the tech sector.
Source: YES Women in Technology online survey, April 2013.

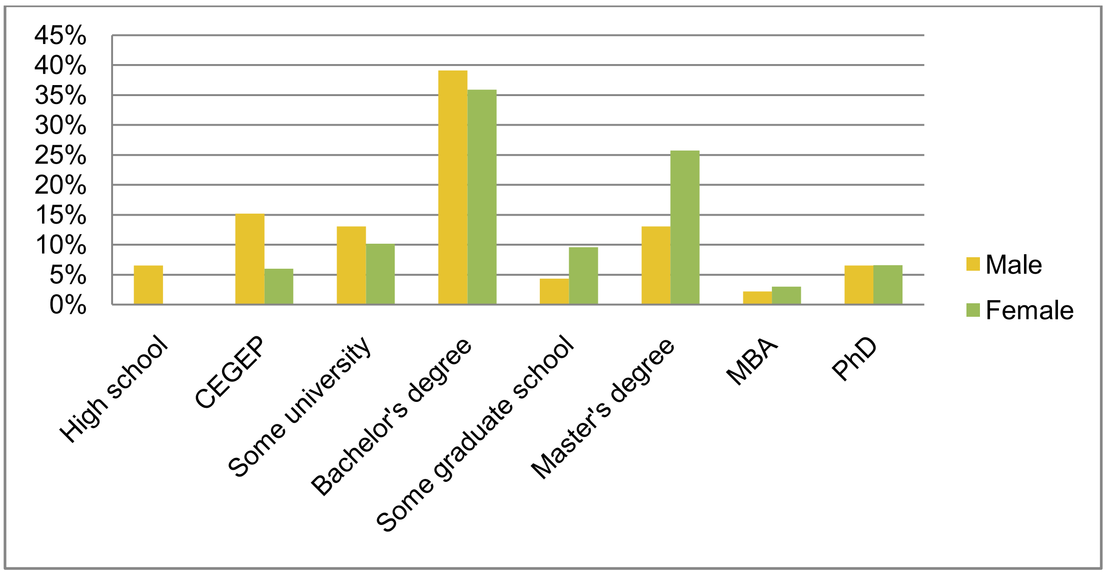
26% of *all employees in soft-technical* roles have less than 2 years experience in the sector. The growth in interest in soft-technical roles indicates new opportunities and growing interest in the sector. Roles in social media, SEO and web analytics add a variety of creative and data-driven approaches to the technology sector.

Women in Technology – Quebec Perspective

Education and Training

Finishing rates indicate males working in Quebec's technology sector are more likely to strike out into the workforce with fewer academic credentials. While the number of men with high school, CEGEP and Bachelor degrees outnumber women, women in Quebec show a greater propensity for post-graduate education.

TABLE 2.8 SURVEY RESPONDENTS - HIGHEST LEVEL OF EDUCATION



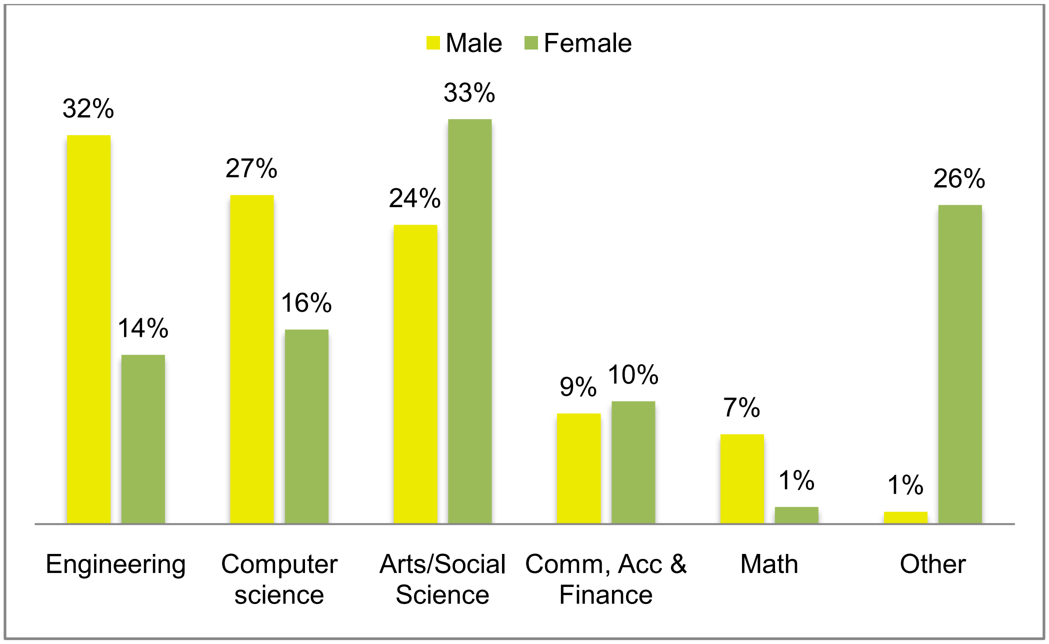
n=546
Question: Highest level of education
Source: YES Women in Technology online survey, April 2013

7% of men indicated their highest level of education completed was high school, 15% of men indicated they completed CEGEP and 13% of men indicated completion of some university. 36% of men completed a Bachelor's degree. While 26% of male respondents attended graduate school, 22% of these men completed a graduate degree.

In contrast, women were much more likely to continue their education post-undergraduate degree. 45% of female respondents attended graduate school, while 36% of female graduate students obtained a graduate degree. This pursuit of post –graduate education effectively delayed the female survey respondents' entrance into the workforce.

The quest for higher education was frequently discussed within the focus groups. 60% of female participants indicated they constantly sought new credentials, especially when a promotion or new job was in the works. Female focus group participants believed that they must study first in order to contribute to the workforce. They also believed men do not feel the same need to acquire credentials; instead, men chose to advance their careers without formal qualifications.

FIGURE 2.9 SURVEY RESPONDENTS - UNIVERSITY MAJOR



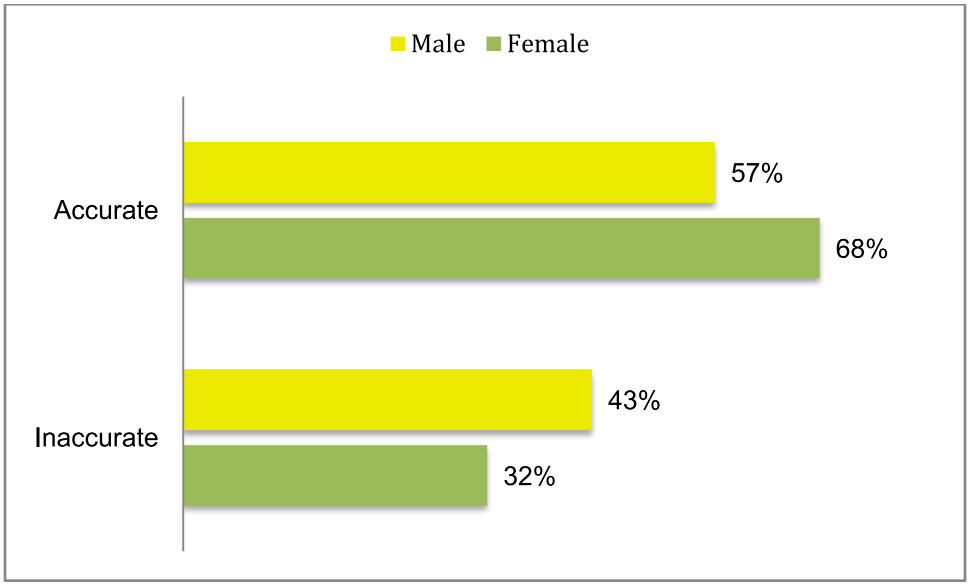
n=205
Question: University major
Breakdown represented by *only those with undergraduate degrees as the highest level of education*
Source: YES Women in Technology online survey, April 2013

University students and graduates show a marked preference for areas of study by gender. Male students were more likely than women to study engineering (32% vs. 14%), computer science (27% vs. 16%) and math (7% vs. 1%). Women, on the other hand, were 9% more likely to study the Arts and Social Sciences.

While men dominate the study of STEM, an interesting trend appears in declared minors. Men and women study computer science equally as a minor, while women study math more often as a minor. This could indicate a reluctance to dedicate oneself completely to the study of STEM, instead preferring to study STEM as a compliment to non-technical area of study.

When asked if “boys and girls receive different levels of encouragement in science and math in primary and secondary school”, 68% of women and 57% of men indicated they believed the statement to be accurate.

FIGURE 2.10 SURVEY RESPONDENTS - BOYS AND GIRLS RECEIVE DIFFERENT LEVELS OF ENCOURAGEMENT IN SCIENCE AND MATH IN PRIMARY AND SECONDARY SCHOOL



n=345
Question: Boys and girls receive different levels of encouragement in science and math in primary and secondary school
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

Throughout the focus groups, similar data was presented time and again; participants indicated that the syllabi used in primary and secondary school favours gendered styles of learning. Most often, science and math are designed to appeal to boys, while arts and language are taught in a style that appeals to girls. Teachers and parents are also more likely to encourage boys to work hard in science and math, while less emphasis is placed on the importance of girls succeeding in these subjects. In some cases, women were actually dissuaded from studying math beyond the basic requirements in high school.

When asked to qualify the obstacles facing women pursuing careers in science and technology, focus group participants identified and ranked the following issues:

FIGURE 2.11 FOCUS GROUP RESPONDENTS - OBSTACLES TO EDUCATION

Obstacles to acquiring education for careers in technology	Quotes from Participants
Level of encouragement to enter technical field lacking	"As a little girl, I was always encouraged to do well in art and languages. Math just seemed so hard, and no one told me otherwise."
Lack of adequate primary and secondary school training in math and technology	"Kids spend way too much time learning boring math and jump through so many hoops. And for what? The math you learn at school doesn't prepare you for the technology problems you see at work."
Access to knowledge about technology career choices limited at pivotal decision-making stages	"I wish that someone had told me how many options I'd have if I took math in high school. I shut so many doors too early in life."
Socialisation to male & female work styles (assertive vs. passive) throughout childhood	"Even now, my son and daughter are treated differently at school. They are taught to play with different toys, solve problems in different ways. And this stays with them throughout their entire lives."
Misconceptions about technical education (geeky, boring, hard, anti-social)	"I've always loved math. I would practice all weekend. It wasn't hard for me. But girls in my classes made life hard for me – just because I didn't struggle. There's just something about math that people think is awful."

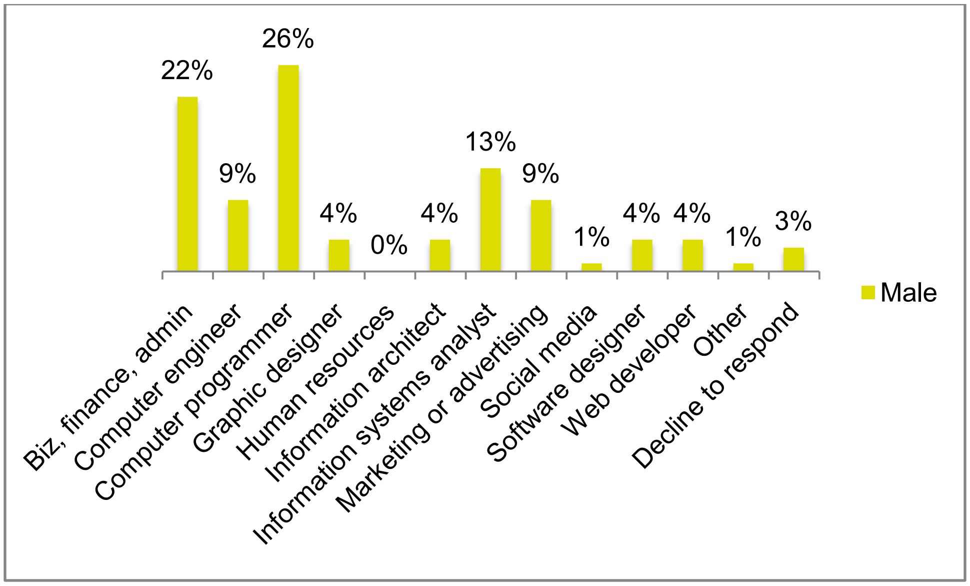
Source: YES Women in Technology focus groups, February - April 2013

All 8 focus groups conducted as part of the YES WIT study identified the presentation of math, computer and science programming in primary and secondary school as obstacles to STEM study. According to several participants, programming in school is boring and narrow; it does not expose the many career options available to students upon graduation. Early education often fails to provide different approaches to studying math and technology, creating an imbalance in the students who are thought to be 'able' to study the subjects. Participants believed that with a different approach to early years teaching, many more people – not just women – would enjoy the study of science and math.

Career & Workplace

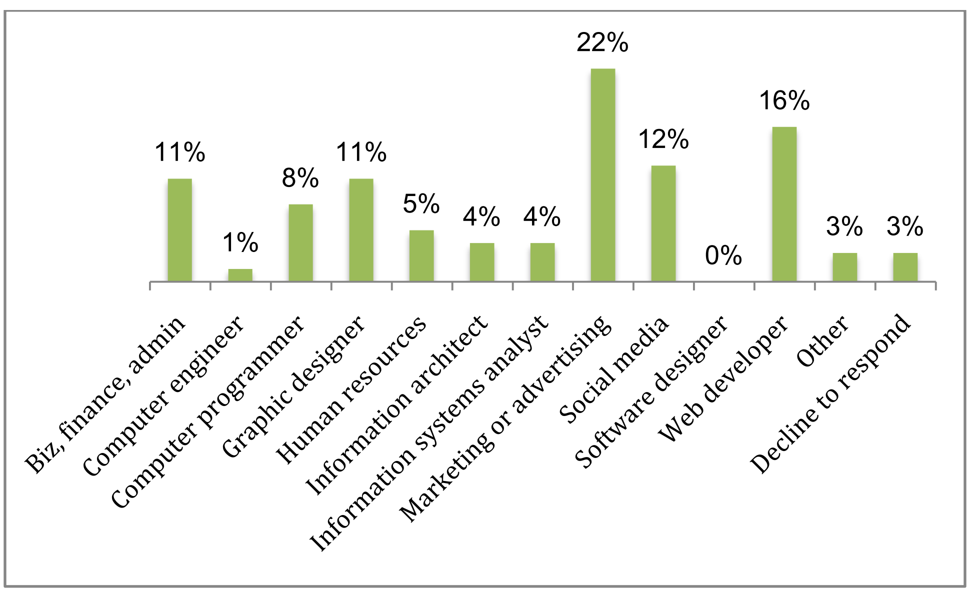
Once part of the workforce, Quebec-based men maintain their STEM dominance.

FIGURE 2.12: SURVEY RESPONDENTS: OCCUPATION BY GENDER, REPRESENTED AS % OF ALL OCCUPATIONS HELD BY MEN



n = 370
Question: Occupation by gender, represented as % of all occupations per gender;
Breakdown *excludes respondents who skipped the question*
Source: YES Women in Technology online survey, April 2013

FIGURE 2.13: SURVEY RESPONDENTS: OCCUPATION BY GENDER, REPRESENTED AS % OF ALL OCCUPATIONS HELD BY WOMEN

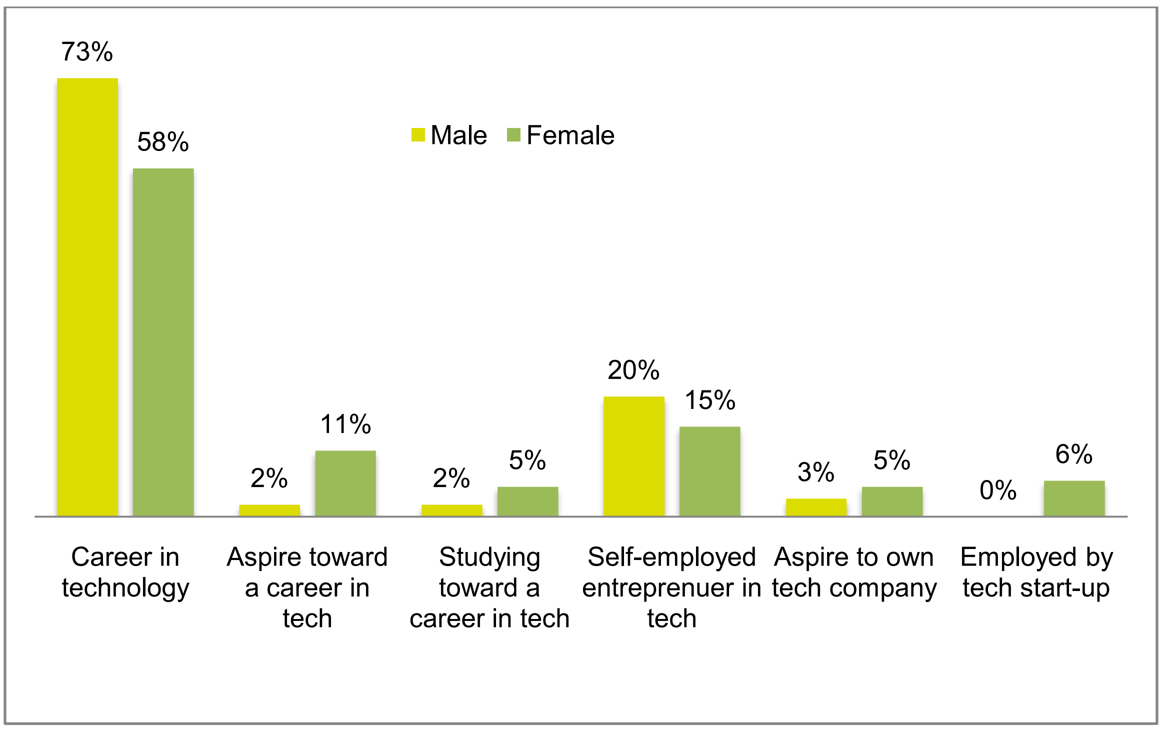


n=370
Question: Occupation by gender, represented as % of all occupations per gender
Breakdown *excludes respondents who skipped the question*
Source: YES Women in Technology online survey, April 2013

While women hold the majority of positions in graphic design, marketing, social media and web development, men hold the bulk of positions in computer programming, engineering, information systems and software development. It appears that women are more likely to occupy creative roles, while men occupy implementation roles.

University study does not guarantee where a student might work upon graduation, nor does it suggest the bent of a student's career aspirations. When asked about their careers and career aspirations, 73% of men and 58% of women indicated they currently work in the technology sector. Only 5% more men than women indicated they are self-employed or run a start-up in the tech sector (20% men and 15% women).

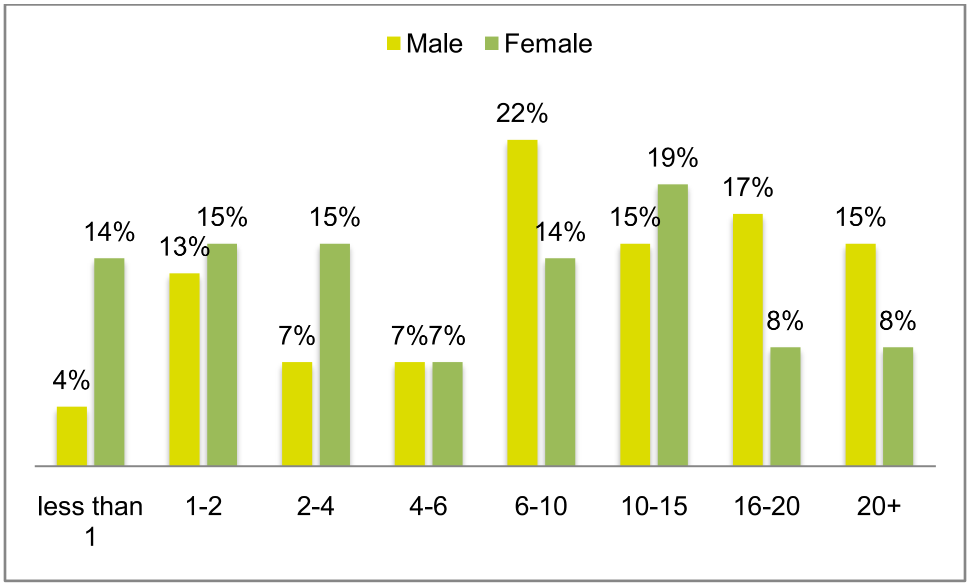
FIGURE 2.14 SURVEY RESPONDENTS: DESCRIBE YOUR SITUATION (GENDER)



n=345
Question: Describe your situation
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013.

A source for optimism comes from the number of women studying for and aspiring to a career in technology; 5% women are studying for a career in technology, while 11% women aspire toward a career in technology. It must be noted that no males employed by start-ups responded to the survey; while many men are employed in the start-up environment in Montreal they did not respond to the survey.

FIGURE 2.15 SURVEY RESPONDENTS – YEARS IN TECHNOLOGY SECTOR, AS % OF EACH GENDER



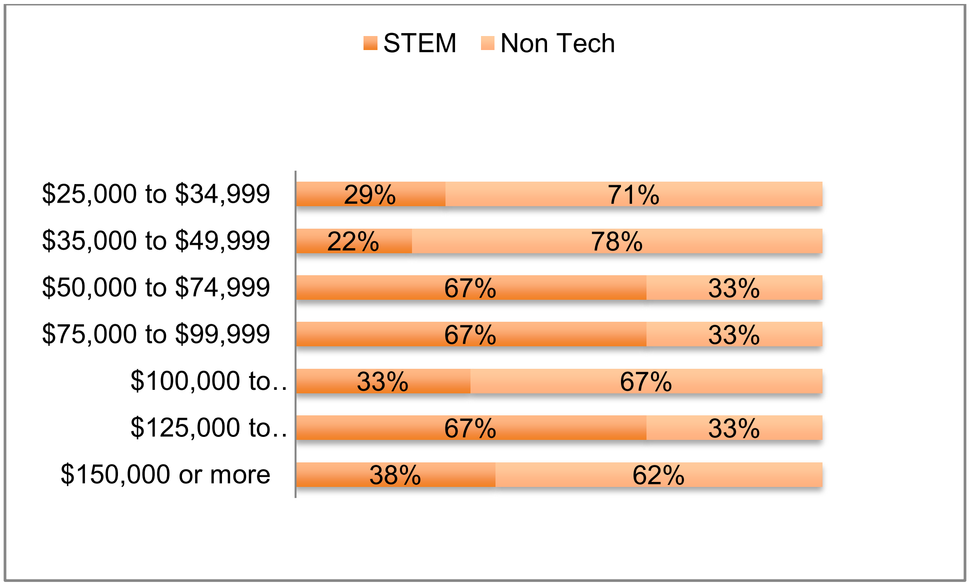
n=345
Question: Years in Occupation, Technology Sector respondents, represented as % of each gender
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013.

Respondents with 4-6 years of experience in the technology sector are lacking, according to survey results. Industry research suggests employees with more than 4 years experience in the job market believe they have accumulated the required expertise and funds to strike out on their own – be it in a technology role or on other endeavours. Alternatively, this gap may be associated with childbearing years. Assuming female respondents completed university by the age of 21 or graduate school by the age of 23, women are in their late 20s and early 30s by the time they accumulate 4-6 years experience in the workforce. Notably, the number of women in the technology sector increases from 6-15 years; their absence in the workforce may only be temporary. This evidence suggests women may take time with family post childbirth, or may struggle to re-enter the workforce post maternity leave.

Technology workforce fall-out also occurs at the 16-20 year mark. As stated in the literature review, women frequently tire of the technology workplace and seek new opportunities within 10-20 years of beginning their careers. The same trend appears to be occurring in Quebec's technology sector.

Feedback from the focus groups indicated that all women with more than 6 years experience in the technology sector had either come close to giving up on the tech sector, or had quit in order to work in non-technical roles. One participant observed "It's death by a thousand cuts. There's only so many times I can be asked to take notes and get coffee and deal with the 'jokes' before I just give up. I paid my dues, I got the CS degree and worked the long hours. What gives?"

FIGURE 2.16 SURVEY RESPONDENTS - HOUSEHOLD INCOME AND OCCUPATION



n=471
Question: Household Income and Occupation
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013.

Survey respondents were asked to provide their household income. 39% of respondents indicated they were single and the sole income earners in their household. 55% of respondents indicated they were married or part of a common-law couple sharing the income contribution to the household.

Analyses indicated that households with at least one STEM employee have a higher household income at the mid-tier salaries. High-earning households in the tech sector include one member employed in:

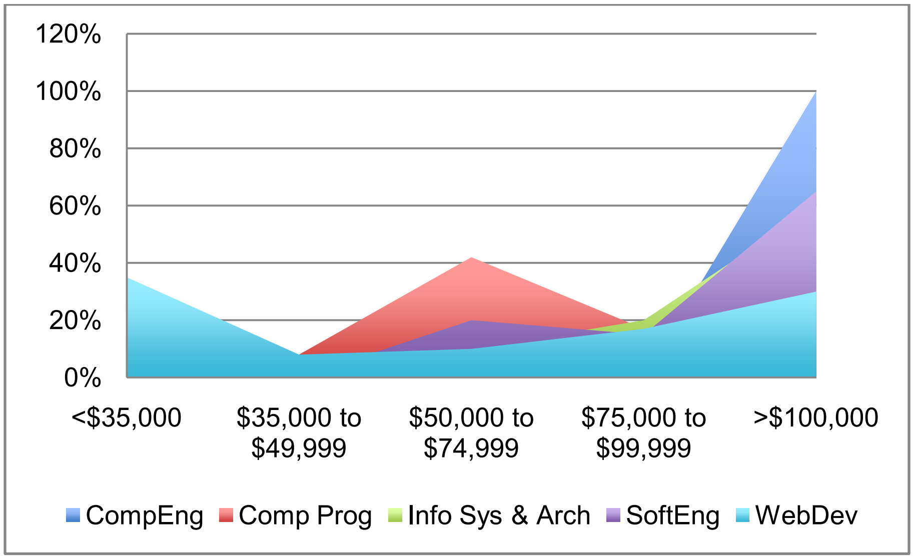
- Computer Engineering
- Computer Programming
- Information Architecture
- Info Systems Analyst
- Software Engineer
- Software Designer

However, STEM occupations are not exclusively the high earners in Quebec households. 25% of households surveyed indicated their incomes were greater than $100,000 annually, and one member of the household worked in a soft-technical role in the technology sector. High-earning soft-technical roles include:

- Business, Finance and Accounting
- Marketing/Advertising
- Product Management

For those households earning less than $35,000, respondents indicated their roles are in graphic design, social media and marketing.

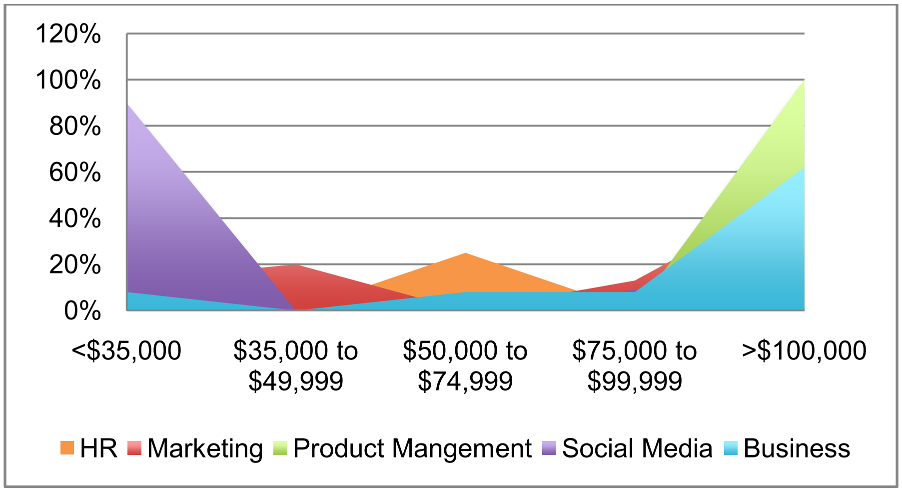
FIGURE 2.17 SURVEY RESPONDENTS: HOUSEHOLD INCOME AND OCCUPATION; INCOME REPRESENTED AS % OF ALL EMPLOYEES IN AN OCCUPATION (STEM)



n=471
Question: Household Income and Occupation; Income represented as % of all employees in an occupation
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013.

When analysing the household incomes for an occupation, stratification becomes apparent even between technical roles. Web development, frequently called a 'soft' technical occupation in the focus groups (as it does not require complicated code and is relatively easy to learn), sees the bulk of its household incomes fall under $50,000 annually. Alternatively, Computer Engineering (a discipline that requires significant training, practice and a degree), sees employees receive household incomes exclusively above $75,000.

FIGURE 2.18 SURVEY RESPONDENTS - HOUSEHOLD INCOME AND OCCUPATION; INCOME REPRESENTED AS % OF ALL EMPLOYEES IN AN OCCUPATION (SOFT-TECHNICAL)



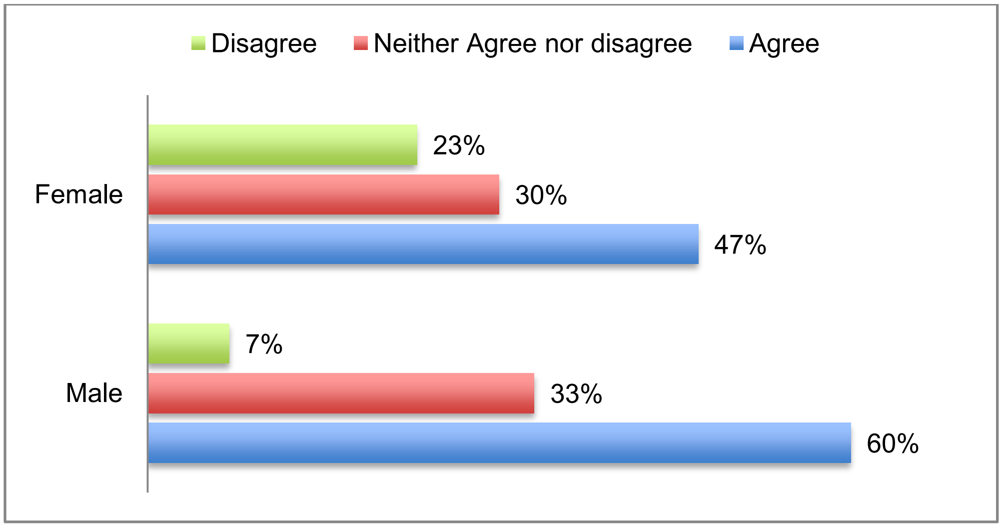
n=471
Question: Household Income and Occupation; Income represented as % of all employees in an occupation
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013.

With respect to soft-technical roles, households that include members with Business and Product Management roles see household incomes that frequently exceed $75,000. Households that rely on employment in Social Media see household incomes below $50,000.

Workplace Culture

A disconnect exists between what men and women believe about wage equity. According to survey results, 60% of men believe salary inequities have improved over the past 10 years. Some 47% of women agree with the same statement.

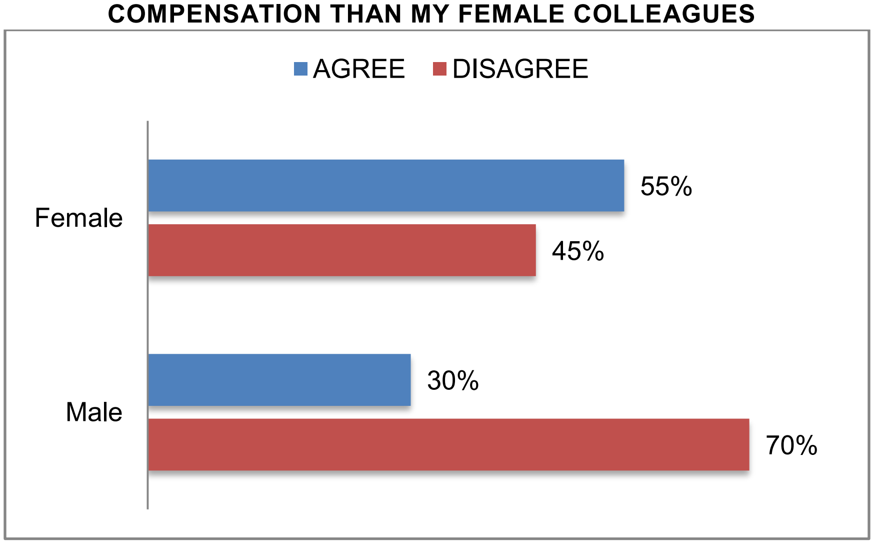
FIGURE 2.19: SURVEY RESPONDENTS: IN THE LAST DECADE THERE HAS BEEN SOME IMPROVEMENT IN ADDRESSING SALARY INEQUITIES BETWEEN MEN AND WOMEN?



n=345
Question: In the last decade there has been some improvement in addressing salary inequities between men and women?
Breakdown *excludes* respondents who chose not to answer
Source: YES Women in Technology online survey, April 2013.

23% of female respondents believe that salary inequities have not improved. Almost a quarter of the women in Quebec's technology sector believe that men are paid more than women, causing an imbalance in the perceived value placed on women and men's work.

FIGURE 2.20 SURVEY RESPONDENTS - MY MALE COLLEAGUES RECEIVE BETTER COMPENSATION THAN MY FEMALE COLLEAGUES



n=345
Question: My male colleagues receive better compensation than my female colleagues
Breakdown *excludes* respondents who chose not to answer
Source: YES Women in Technology online survey, April 2013.

Furthermore, 55% of women believe their female colleagues receive lesser compensation than their male colleagues. 70% of men indicated they do not believe that males receive better compensation than females.

The pay inequity debate is one that respondents addressed in both the survey and the focus group. Women do not believe they receive compensation on par with their male colleagues, but this is just one of many obstacles that complicate working life in the technology sector.

When asked to address what obstacles exist in Quebec's technology sector, participants indicated the following issues impact their daily work (shown in order of importance).

FIGURE 2.21 FOCUS GROUP RESPONDENTS - OBSTACLES IN THE WORKPLACE

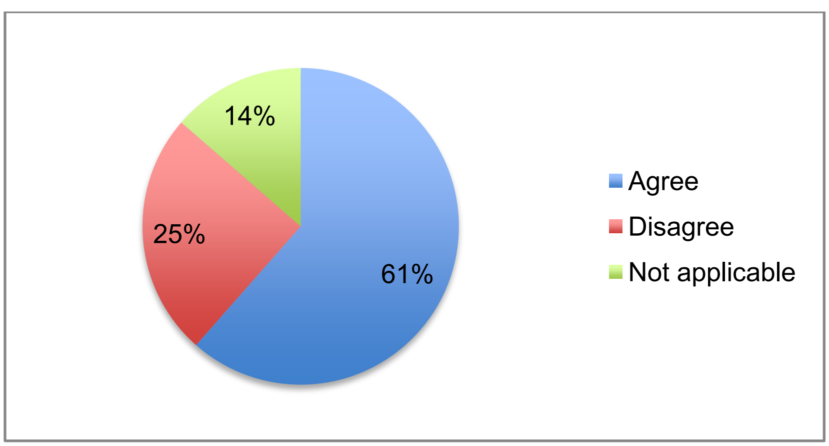
Obstacles in the workplace	Issues and Observations
Male dominated management - The "Boy's Club"	- Preferential promotions for male candidates - Social engagements that create workplace camaraderie AND exclude women - Sense of belonging simply based on gender (language used, body language)
Lack of mentorship	- Too few female role models in the technology sector - Too few mentors to help women navigate the workplace - Sense of elitism from women who've 'made it'
Management doesn't prioritise gender balance/finding qualified women	- Preferential HR screening practices; in certain roles women are screened out more quickly, either for perceived fit or perceived sense of inability - Hiring managers treat hiring like dating; they hire people who are like them – thus screening out women
Pay inequity	- Female ghettos: women trapped in documentation, QA and administration roles that pay less - Women in technical roles don't negotiate effectively, thus taking less compensation than men - Path for career progression lacking, due to lack of guidance in the

	workplace or a stifling of ambition by harsh workplaces
Women must work harder than men to build credibility	- Differing work styles create impression of incompetence; fails to consider differing problem solving skills - Lack of support from peers and lack of communications; unable to understand issues clearly without looking 'overly sensitive' - Perceived ability; women thought to be less capable
Tech 'culture'	- Acceptance of 'brogramming' & competitive coding - Machismo in the workplace - Sexist expectations (admin tasks, lunch orders) and imagery
Women-led start-ups must work harder for funding and credibility	"I get the picture, guys. Women do not belong at the helm of tech companies. You've made yourselves clear." – Focus group participant

Source: YES Women in Technology Focus Groups, February - April 2013.

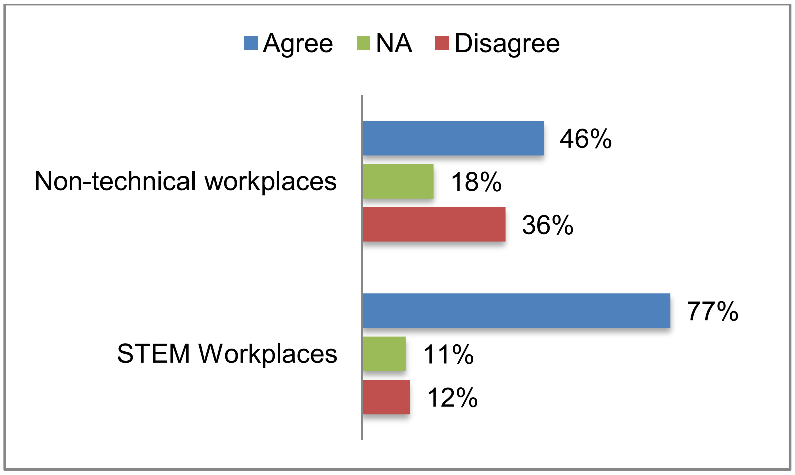
The issues identified in the focus groups seem more daunting because of male dominance in technology workplaces. 61% of respondents in the technology sector indicated their workplace is mostly male.

FIGURE 2.22 SURVEY RESPONDENTS - MY WORKPLACE IS MOSTLY MALE



n=345
Question: My workplace is mostly male
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013.

FIGURE 2.23 SURVEY RESPONDENTS - MY WORKPLACE IS MOSTLY MALE

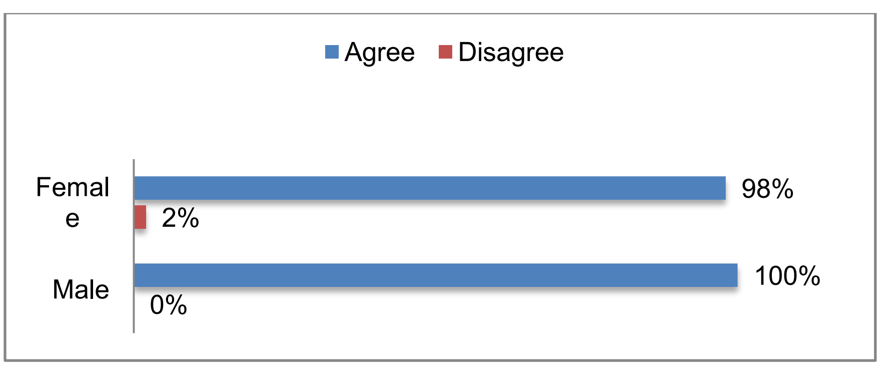


n=345
Question: My workplace is mostly male
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013.

According to focus group participants, many technology workplaces become hostile work environments for women when:

- A disconnect exists between women and men's willingness to bend to work pressure. Long hours and exceedingly high performance requirements prevent a cultural fit for women with commitments outside the workplace.
- Unwanted sexual teasing is present, no matter how infrequently.
- Women are expected to organise events, order food and take notes.
- Work completed by women is ignored until presented and claimed by a male colleague.

FIGURE 2.24 SURVEY RESPONDENTS I AM COMFORTABLE WORKING WITH PERSONS OF THE OPPOSITE SEX

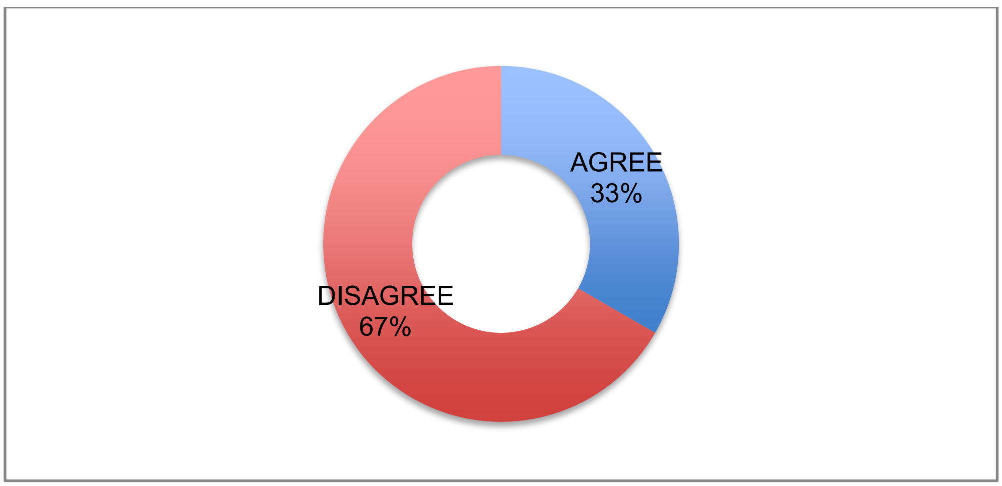


n=345
Question: I am comfortable working with persons of the opposite sex
Breakdown excludes respondents who chose not to answer
Source: YES Women in Technology online survey, April 2013

While women state that male-dominated environments prevent integration into the workplace, 98% of all respondents indicated they are comfortable working with persons of the opposite sex. The issue is not one of personal discomfort, but a sense of belonging and understanding. Women and men may feel comfortable working with one another, but may not believe that the opposite sex understands their perspective or point of view. Biases about a gender may influence the way information is interpreted, or roles are assigned.

In part, biases can be broken down through socialisation between the genders in the workplace. 67% of respondents indicated men and women socialise at work. Good working relationships, by and large, come from convivial social relationships. Harmonious social relationships can also promote a healthy and open work atmosphere, where individuals openly express their opinions. Over time, exposure to these opinions can help to reshape bias. However, exclusionary behaviours and expectations may prevent valuable socialisation from occurring.

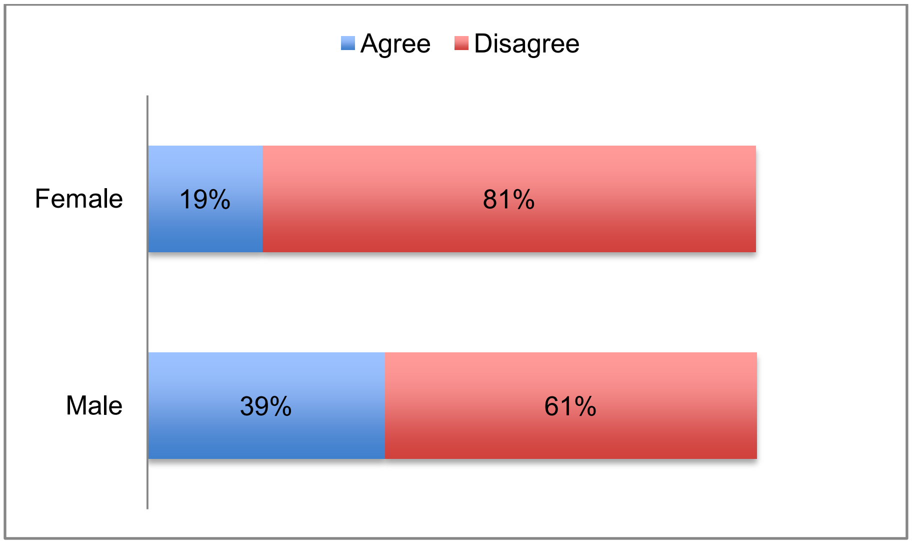
FIGURE 2.25 SURVEY RESPONDENTS - MY MALE COLLEAGUES SOCIALISE WITH MEN, AND MY FEMALES COLLEAGUES SOCIALISE WITH WOMEN



n=345
Question: My male colleague socialise with men, and my females colleagues socialise with women
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

A sense of exclusion in the workplace may stem from corporate approaches to diversity. When asked: “Technology companies spend adequate time addressing diversity”, 81% of women disagreed. Almost 40% of men agreed with the statement, leaving a notable gap between each gender’s perceptions of what ‘adequate’ attention to diversity consists. Is there a common understanding of what is meant by diversity?

FIGURE 2.26 SURVEY RESPONDENTS - TECHNOLOGY COMPANIES SPEND ADEQUATE TIME ADDRESSING DIVERSITY

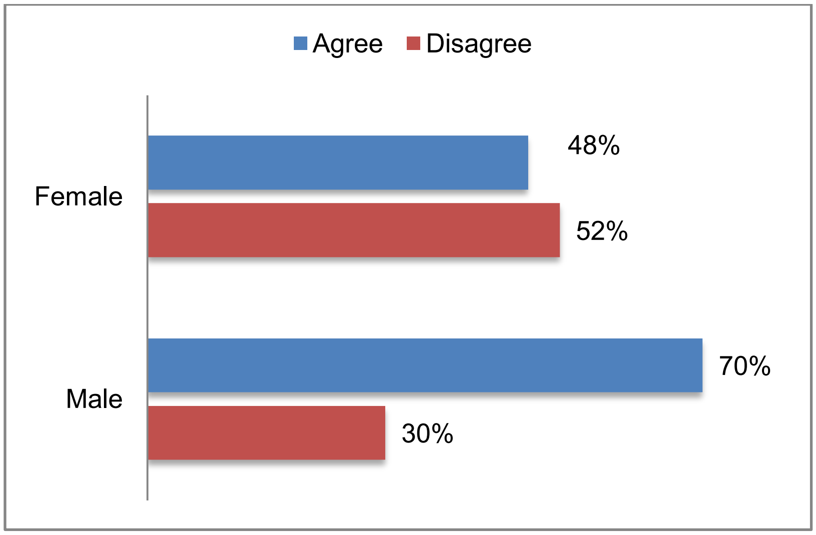


n=345
Question: Technology companies spend adequate time addressing diversity
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

The disconnect on the subject of gender equity becomes even more apparent when men and women were asked if they agree or disagree with the statement; "men and women have the same opportunities in Science and Technology". While 52% of women disagreed with this statement, 70% of men believe the statement to be true.

This is a sentiment echoed through the interviews; women who worked in large technology corporations stated that while diversity policies were in place, they felt the policies were merely paying lip service to real issues. One focus group participant declared "Upper Management made team leaders attend a sexual harassment seminar each year. It became a running joke: we were going to the session to learn how to sexually harass people. It was a waste of time and really didn't make a difference. Just a way for management to say they were taking action. The same old (sexist) crap just kept happening."

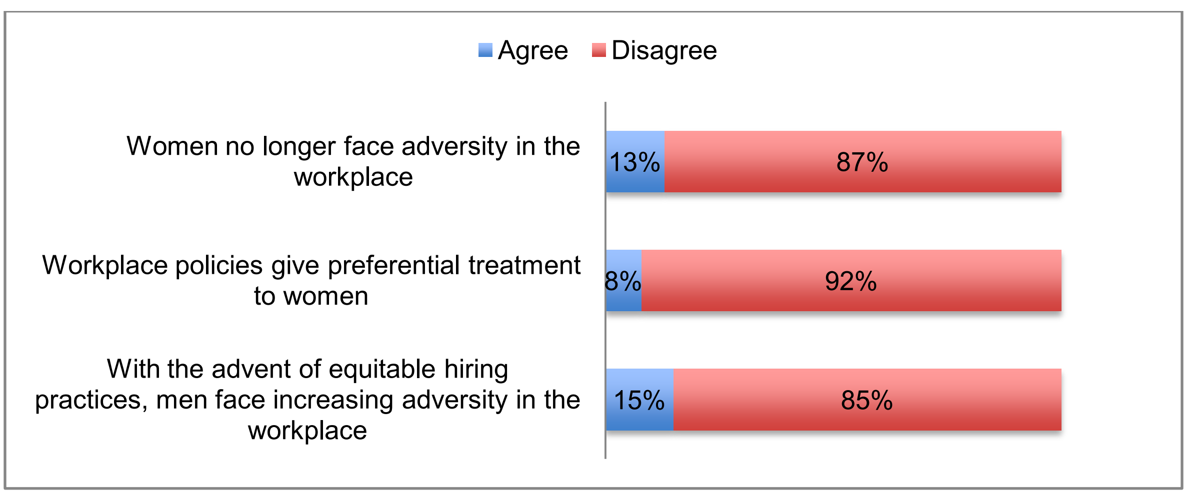
FIGURE 2.27 SURVEY RESPONDENTS - MEN AND WOMEN HAVE THE SAME OPPORTUNITIES IN SCIENCE AND TECHNOLOGY



n = 345
Question: Men and women have the same opportunities to succeed in Science & Technology
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

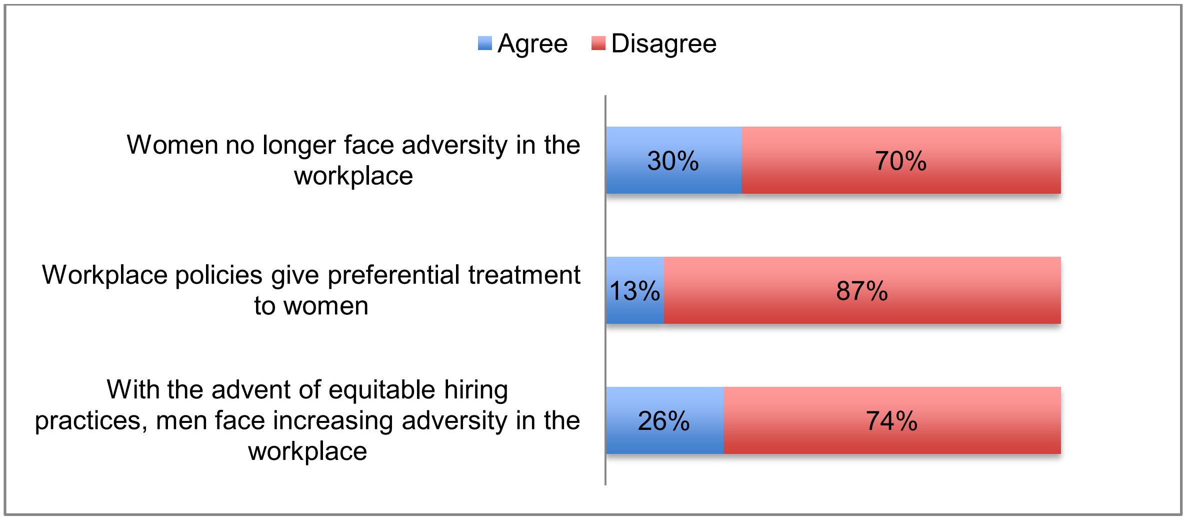
When asked a series of three questions related to adversity, gender and the workplace, respondents showed varying perceptions about the plight of women and men.

FIGURE 2.28 FEMALE SURVEY RESPONDENTS – WOMEN NO LONGER FACE ADVERSITY IN THE WORKPLACE, WORKPLACE POLICIES GIVE PREFERENTIAL TREATMENT TO WOMEN & WITH THE ADVENT OF EQUITABLE HIRING PRACTICES MEN FACE INCREASING ADVERSITY IN THE WORKPLACE



n = 345
Question: Women no longer face adversity in the workplace; Workplace policies give preferential treatment to women; with the advent of equitable hiring practices men face increasing adversity in the workplace
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

FIGURE 2.29 MALE SURVEY RESPONDENTS – WOMEN NO LONGER FACE ADVERSITY IN THE WORKPLACE, WORKPLACE POLICIES GIVE PREFERENTIAL TREATMENT TO WOMEN & WITH THE ADVENT OF EQUITABLE HIRING PRACTICES MEN FACE INCREASING ADVERSITY IN THE WORKPLACE



n = 345
Question: Women no longer face adversity in the workplace; Workplace policies give preferential treatment to women; With the advent of equitable hiring practices men face increasing adversity in the workplace
Breakdown excludes respondents who chose not to answer
Source: YES Women in Technology online survey, April 2013

Despite the presence of diversity policies and sensitivity training in many corporations, 87% of women and 70% of men indicated they believe women still face adversity in the workplace. Focus group feedback indicated these issues include:

- Sexism (overt and unconscious)
- Inappropriate comments and touching
- Unwillingness to cooperate, work with and be led by women
- Exclusion from social and professional circles

Respondents agreed that workplace policies did not give women preferential treatment; 87% of men and 92% of women indicated these policies did not provide exclusive advantage to women. At the same time, 85% of women and 74% of men indicated that equitable hiring practices did not impact a male's inclusion and ability to succeed in the workplace. These results suggest the hiring and diversity practices may help women enter the workplace, but the cultural aspects challenge a woman's success and happiness in the workplace.

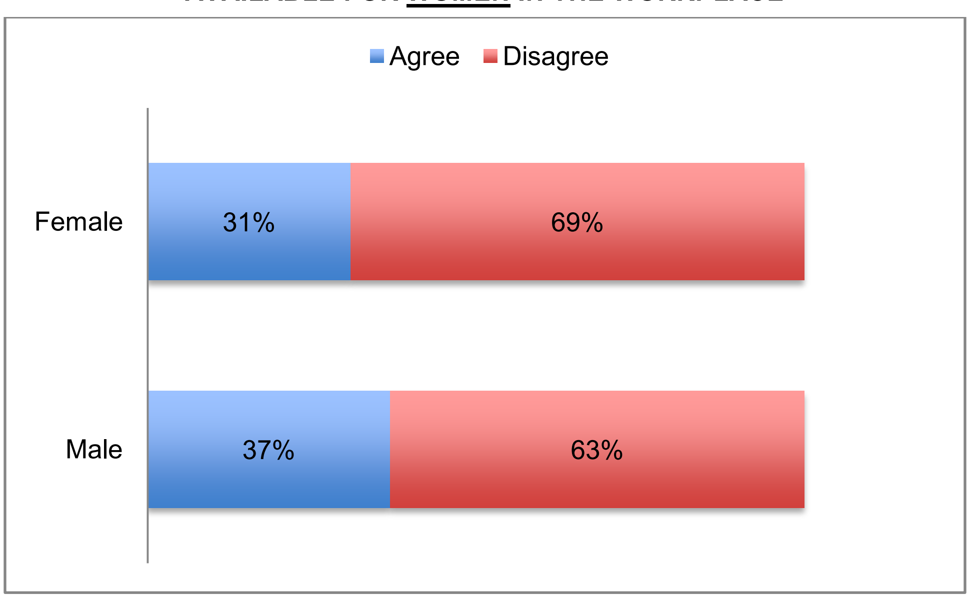
FIGURE 2.30 FOCUS GROUPS RESPONDENTS - BIASES IN THE WORKPLACE

Examples of biases in the workplace
Women underestimated based on gender alone
Overt and casual sexism
Stereotypes
Societal pressures and obligations
Stereotypes set about women and men in the field
Biases
Fear of 'geek' culture
Competitive women: destructive culture

Source: YES Women in Technology focus groups, February – April 2013

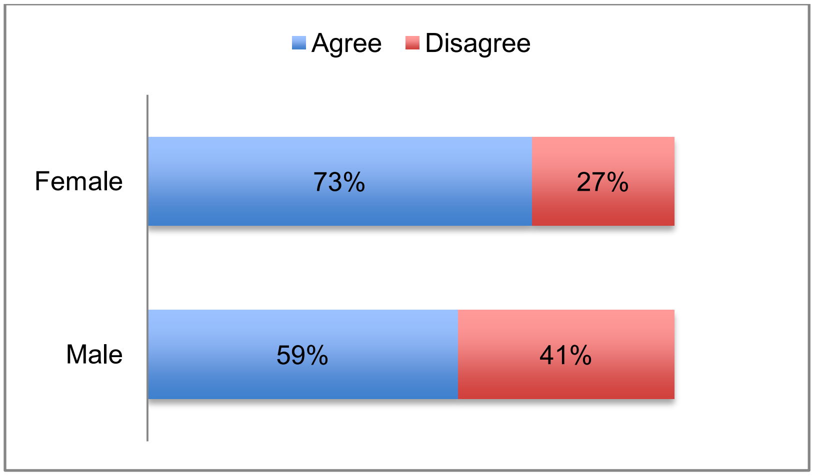
Much of the adversity and bias experienced in the workplace could be overcome with experience. Female role models, who can lead by example, can help educate both women and men about how women and men can work together successfully. They can help women make decisions, and learn to be confident without fearing negative feedback about their decision-making skills.

FIGURE 2.31 SURVEY RESPONDENTS - MENTORS AND ROLE MODELS ARE READILY AVAILABLE FOR WOMEN IN THE WORKPLACE



n = 345
Question: Mentors and role models are readily available for women in the workplace
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

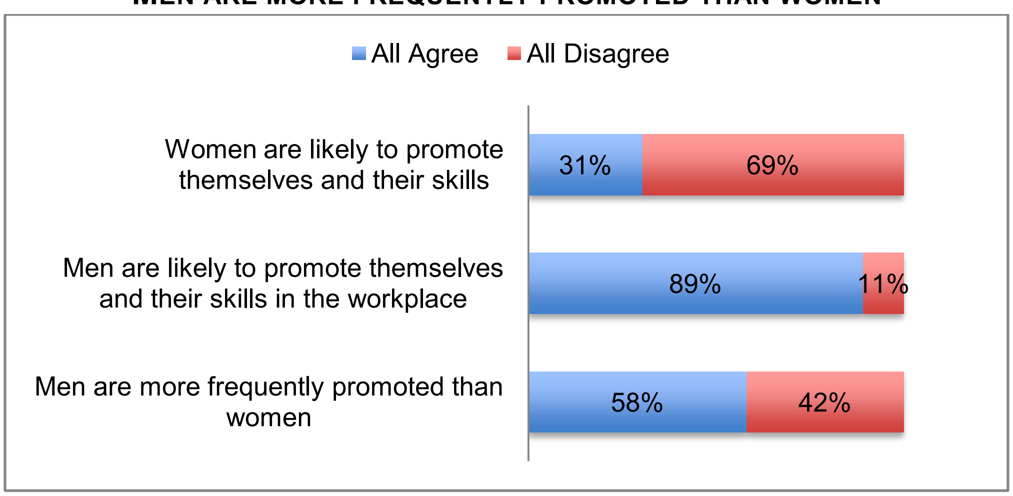
FIGURE 2.32 SURVEY RESPONDENTS - MENTORS AND ROLE MODELS ARE READILY AVAILABLE FOR MEN IN THE WORKPLACE



n = 345
Question: Mentors and role models are readily available for men in the workplace
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

However, 69% of women indicated that role models and mentors are lacking in the workplace. They lack the knowledge of women who have raised families while working, and lack the advice on how to deal with judgment about leaving children at home while they work.

FIGURE 2.33 SURVEY RESPONDENTS - WOMEN ARE LIKELY TO PROMOTE THEMSELVES AND THEIR SKILLS MEN ARE LIKELY TO PROMOTE THEMSELVES AND THEIR SKILLS MEN ARE MORE FREQUENTLY PROMOTED THAN WOMEN



n = 345
Question: Women are likely to promote themselves and their skills; Men are likely to promote themselves and Their skills; Men are more frequently promoted than women
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

Cultural fit is further affected by employees' drive to succeed. Throughout the survey, focus groups and interviews, respondents indicated that men show a determination to get ahead. According to these respondents, men openly boast about their skills and frequently take on work that they are not the most qualified to complete. This willingness to take a chance to self-promote delineates a difference between many men and women. Survey responses indicate that 89% of all respondents believe that men are likely to promote themselves and their skills. Only 31% of respondents believed women would be likely to promote their skills

Many of the focus group participants concurred with this statement. Male colleagues' ability and willingness to self-promote in the workplace contribute to men earning recognition and promotions more frequently than women. This disconnect between the genders may stem from differing styles of work and communications. Focus group participants provided anecdotal evidence stating: "Women fear men are using bromance and machismo to get ahead. Men accuse women of using feminine wiles to succeed. We really just need to take a minute to understand our difference before accusations escalate."

This same disconnect contributes to the gap between male and female responses to the question "Men are more frequently promoted than women". 63% of women agree, believing their male colleagues more frequently see promotions than their female colleagues. However, 61% of men disagree with the statement. Both genders lack clarity on how their colleagues are chosen for promotion, and why they receive them.

FIGURE 2.34 FOCUS GROUP RESPONDENTS - CULTURAL OBSTACLES THAT OBSCURE MUTUAL UNDERSTANDING

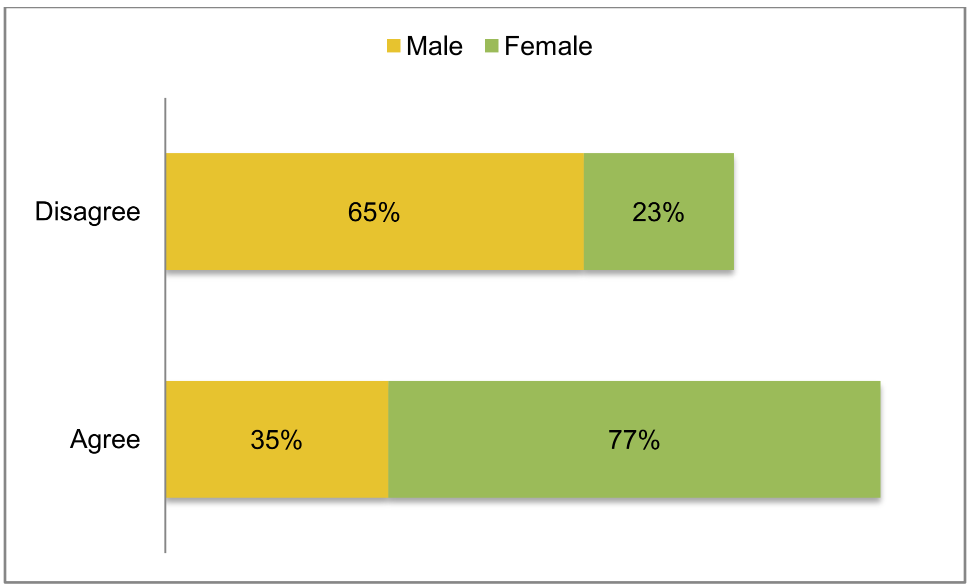
Issues	Participant Observations
Women judged harshly for efforts to be confident and assertive	"Every time a woman at the table expresses her concerns, opinions or ideas, she is told she is 'emotional' or to 'grown a thicker skin'. When we act with confidence we are punished. When we don't act, we miss out and we are punished."
Lack of collaboration	"I always get a sense that the guys are protecting their work and are unwilling to share ideas with me. They try to intimidate me so I stop asking questions. Who cares about our relationship? It's the work that suffers."
Male 'over confidence'	"I always hold back when a big task is presented...When I don't speak

	up, a male peer takes on the job… I'd do a better job; it's just that he presents his capabilities confidently. The end product may be inferior, but that's my fault. I didn't take the risk and ask for the work".

Source: YES Women in Technology focus groups, February - April 2013

Female exclusion in the workplace stems also from gendered tasks and expectations. 77% of women agreed that women are asked to do administrative tasks outside the scope of their daily work. These tasks may include secretarial duties (including note taking and meal organization), event planning and meeting scheduling. This type of gendered activity marginalises women, even those in senior roles.

FIGURE 2.35 SURVEY RESPONDENTS - WOMEN ARE MORE FREQUENTLY ASKED TO DO ADMINISTRATIVE TASKS OUTSIDE THE SCOPE OF THEIR JOBS



n = 345
Question: Women are more frequently asked to do administrative tasks outside the scope of their jobs
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

This gendering of roles – women as administrators, men as decision makers – also extends to industry events. Focus group participants and case study interviews touched on this topic, indicating few women are present at tech events. When they are, they are either 'token women' or 'booth babes'. Too frequently, focus group participants indicated they witnessed sexual comments about other female attendees – sometimes accompanied by violent and abusive language. With such comments made openly, women in Quebec often feel out of place and marginalised at sector events.

A tech sector event organiser indicated efforts to attract more female speakers are a double-edged sword. Since women are less likely to promote themselves, they also see themselves as unworthy of presenting at industry events. "If finding worthy speakers requires them to come to you to ask to speak, you're never going to get women to speak. You have to appeal to them, show them that they are worthy."

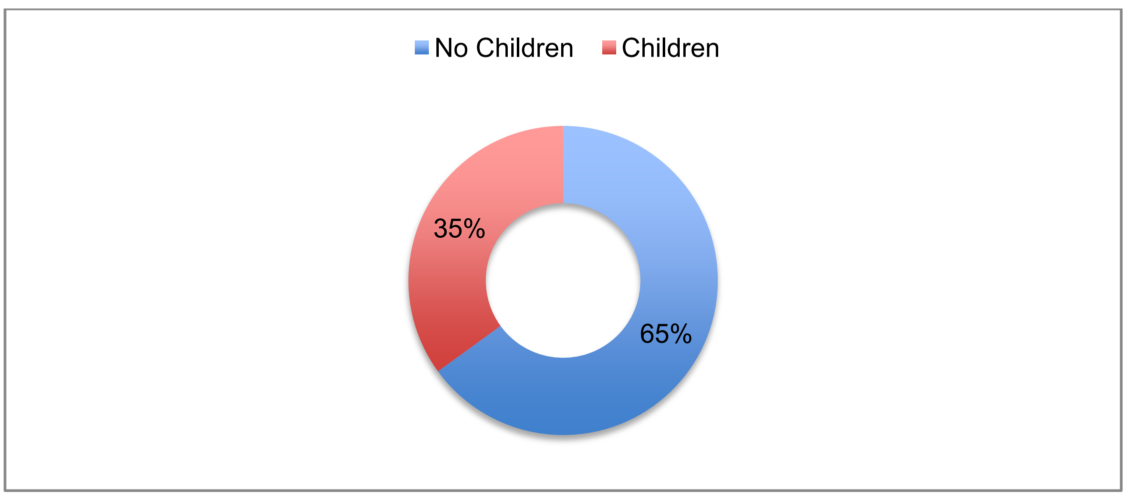
Social Issues Related to the Workplace

Quebec legislation facilitates a life-long approach to social well-being, healthcare and childcare. Provincial policies enable employees to find a sense of balance between work and social life. Ample opportunity exists for male and female parents to attend to their children. The stage is set for success.

It is up to the individual, however, to make decisions that are best for them. Employees are not obligated to work long, frantic hours. If they wish to succeed, they may feel professional pressure to work extra hours under extreme pressure. Tight deadlines accompanied by ambitious revenue objectives frequently drive a sense of urgency that establishes an unwritten workplace code.

This code may appear off-putting to those employees interested in employment in technology, but who value a separate social and family life.

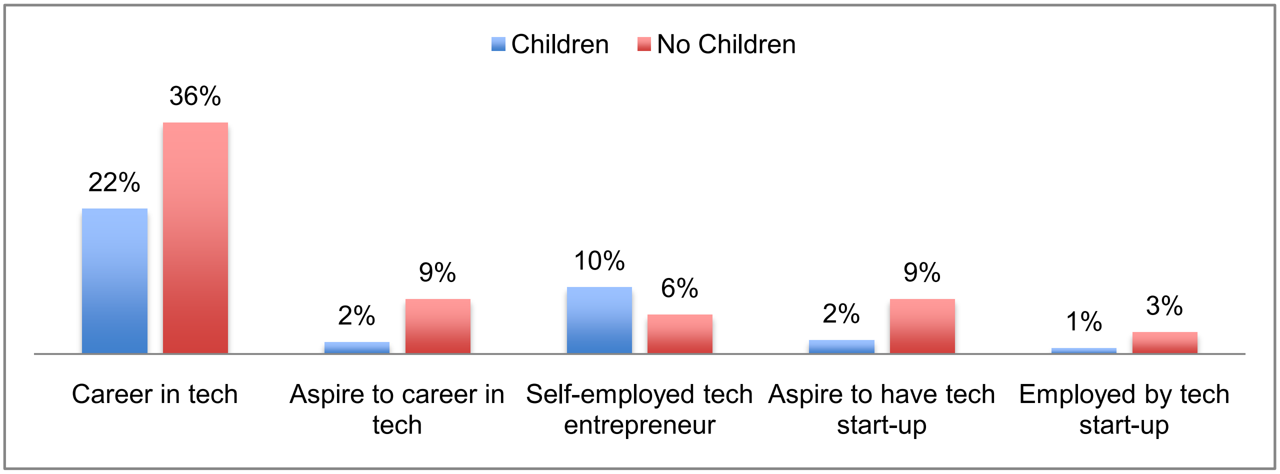
FIGURE 2.36 SURVEY RESPONDENTS – TECH SECTOR EMPLOYEES WITH CHILDREN



n = 329
Question: How many children do you have?
Breakdown excludes respondents who chose not to answer
Source: YES Women in Technology online survey, April 2013

35% of survey respondents indicated they were parents. The vast majority of technology sector workers – 65% – indicated that they do not have children.

FIGURE 2.37 SURVEY RESPONDENTS – HOW MANY CHILDREN DO YOU HAVE & DESCRIBE YOUR SITUATION

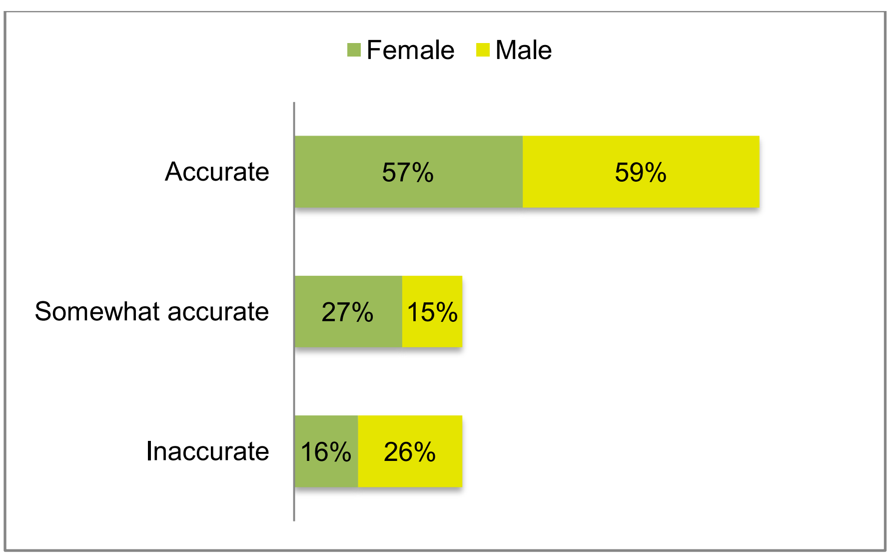


n = 329
Question: 'How many children do you have?' Cross-tabulated by 'Describe your situation'
Breakdown excludes respondents who chose not to answer
Source: YES Women in Technology online survey, April 2013

Proportionally, more parents worked as entrepreneurs than parents in other parts of the sector.

Interviews with start-up founders and entrepreneurs alike indicated the freedom afforded by operating their own business and the passion for their role allowed for greater flexibility in childrearing, and a greater sense of reward.

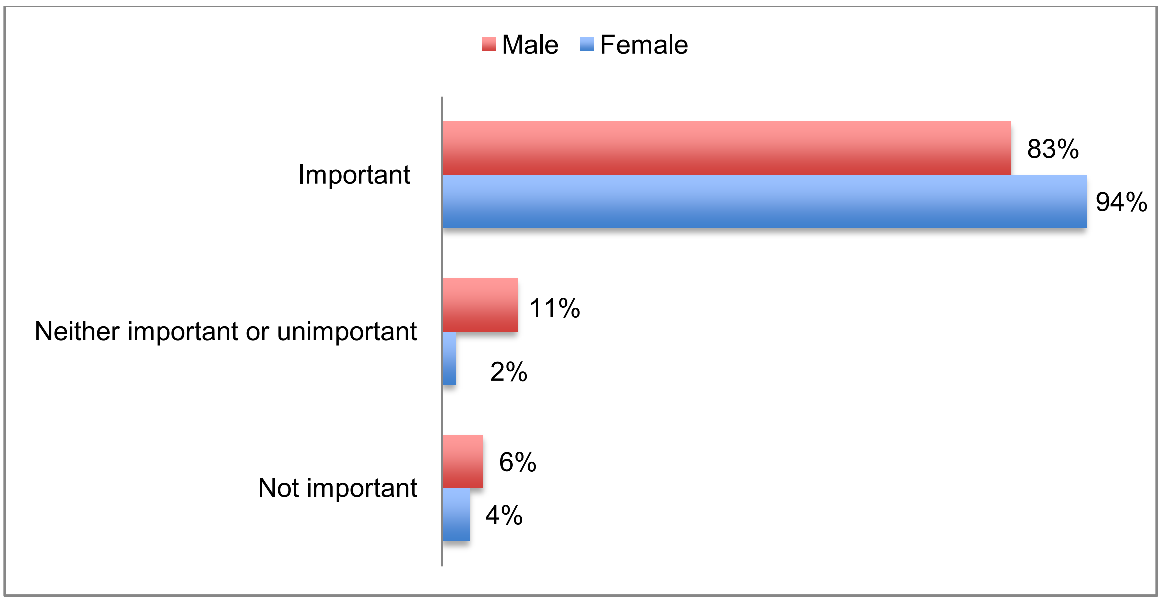
FIGURE 2.38 SURVEY RESPONDENTS - MEN AND WOMEN HAVE DIFFERENT WILLINGNESS TO BE AWAY FROM FAMILY



n = 345
Question: Men and women have different willingness to be away from family
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

In part, men and women's willingness to be away from family impacts their commitment to corporate life, hectic work schedules and extra-curricular work activities. 57% of women and 59% of men indicated men and women have different willingness to be away from family. This can contribute to the sense of dedication in the workplace; those people who value career above all else will make sacrifices to personal obligations in order to succeed. Alternatively, those people dedicated to establishing a family have a different sense of priorities, where as one focus group participant stated, "Pushing the envelope at work just doesn't seem worth it anymore".

FIGURE 2.39 SURVEY RESULTS - HOW IMPORTANT IS FAMILY TO YOU?

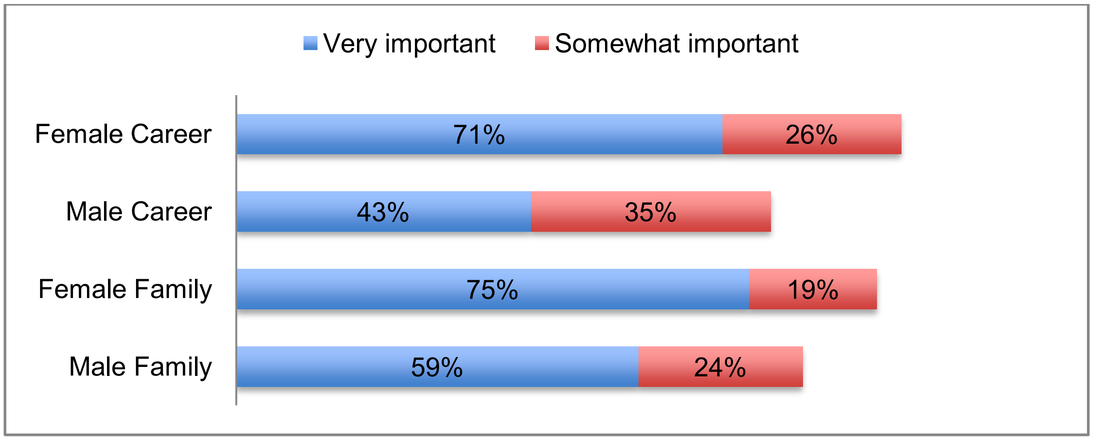


n = 345
Question: How important is family to you?
Breakdown *excludes respondents who chose not to answer*
Source: YES Women in Technology online survey, April 2013

94% of women indicated family was important to them compared to 83% of men. This figure still indicates that the majority of the tech sector values family life and the time required to dedicate oneself to family.

While women in Quebec still struggle to re-integrate into the workforce post-childbirth, their situation is vastly more positive than that of their US colleagues. US-based women interviewed as part of the study indicated their female colleagues were disenfranchised by the approach to maternity leave. Many US companies provide as little as 1 month maternity leave. Not every salary can cover childcare – even in the technology sector. Women are forced to make hard choices: leave their careers, or leave their babies. This set of decision is a considerable cause of workforce fallout for women. Perhaps even worse, the approach to maternity leave triggers a vicious cycle. Employers, both male and female, are reluctant to hire/promote a woman of childbearing age, as they are expected to quit.

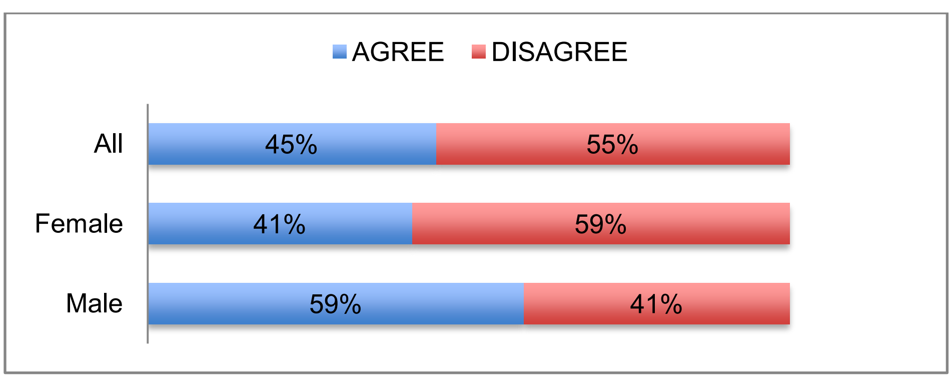
FIGURE 2.40 SURVEY RESPONDENTS - HOW IMPORTANT IS CAREER TO YOU & HOW IMPORTANT IS FAMILY TO YOU?



n = 345
Question: How important is career to you? How important is family to you?
Breakdown excludes respondents who chose not to answer
Source: YES Women in Technology online survey, April 2013

The value of career is paramount to women according to survey results. 97% of female respondents indicated career was important to them; 71% of women state career is very important while 26% of women state career is somewhat important. 78% of men made the same affirmative statement; 43% of male respondents indicated career was very important while 35% indicated career was somewhat important. The weight placed on career indicates women value the opportunity to establish themselves in the workplace, earn a salary and feel a sense of personal development.

FIGURE 2.41 SURVEY RESPONDENTS - MEN AND WOMEN ARE TREATED EQUITABLY WHEN FAMILY COMMITMENTS ARISE

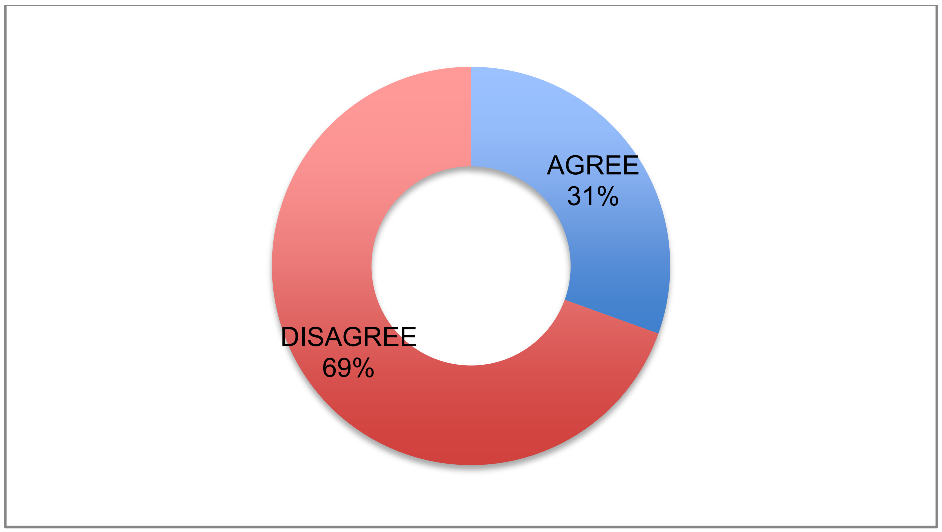


n = 345
Question: Men and women are treated equitably when family commitments arise
Breakdown excludes respondents who chose not to answer
Source: YES Women in Technology online survey, April 2013

Since both men and women in Quebec's technology sector value career and family, the ability to attend to family commitments is important to both genders. Unfortunately, 55% of respondents indicated that men and women are not treated equitably when family commitments arise. Women are 18% more likely than men to believe they are treated differently when family commitment, such as the illness of a child, arises.

While men may wish to deal with family commitments or show compassion in the workplace, 31% of survey respondents indicated men are judged for showing sensitivity in the workplace.

FIGURE 2.42 SURVEY RESPONDENTS - MEN ARE JUDGED FOR SHOWING SENSITIVITY IN THE WORKPLACE



n = 345
Question: Men are judged for showing sensitivity in the workplace
Breakdown excludes respondents who chose not to answer
Source: YES Women in Technology online survey, April 2013

A general consensus from focus groups indicates the emotion is interpreted differently depending on the person and the workplace. One male interviewee indicated brogramming-heavy environments have little tolerance for sensitivity, especially when a man expresses concern for female well-being.

TABLE 2.43 FOCUS GROUP RESPONDENTS – SOCIAL ISSUES IN THE WORKPLACE

Social Issues in the Workplace
Work-life balance - Work-day priorities differ for men and women - Men willing to work long hours & compromise on family life
Managing day-to-day family life requires planning, dedication and perseverance – just like a job
Motivation differs for men & women
Difficult to build & maintain confidence and self-esteem in a male dominated or sexist environment
Decision to have children puts career & promotions at risk
Self-doubt prevents action and fulfillment

Source: YES Women in Technology focus groups, February - April 2013.

WIT RECOMMENDATIONS

The combination of the literature review and the primary data collection indicates the following issues should be addressed in the Quebec market:

Provide a welcoming educational environment

- Provide equal opportunities for girls and boys to learn about STEM. Each child learns differently; educational options must exist that appeal to the interests of every child.
- Build confidence in STEM at an early age. Provide girls and boys alike with the opportunities to learn about functioning technology in an 'unbreakable' environment. Provide real world problems and encourage creative solutions.
- Enable children to build their own solutions. Tear down the pre-requisite barriers that prevent creativity. Allow children to understand 'how things work' and school curriculums are not one in the same.
- Identify teachers and parents with unique educational and work experiences, and encourage them to share with children. Allow children to see the path to STEM careers is varied and interesting.
- Create in-school mentorship programs; allow children interested in STEM to interact with like-minded adults employed in the sector. Create a reassuring and motivating relationship that will allow a child to see a wider perspective on the sector.
- Employ open-minded guidance counsellors, equipped with the knowledge to inform children of the many programs and careers that allow for use of traditional degrees in non-traditional roles.

Break down cultural stereotypes

- Establish the importance of ICT careers. Show children from an early age the potential impacts of ICT. The sector promises the opportunity to do well and earn an excellent salary.
- Ground the sector in everyday tasks. Show how the world is built on technological solutions, and how everyone can lend a hand in contributing to the solutions.
- Demonstrate the value of building relationships, solving problems and learning as a team. ICT is best served when varying points of view work together to reach a common goal. Modern ICT solutions are not developed in isolation; they meet the needs of many parties.
- Work with industry to make ICT more inclusive. Eliminate exclusionary behaviours and attitudes that rank ICT roles, making some seem less valuable than others.

Level the playing field in the workplace

- Focus on diversity as an opportunity for change. Hiring and training individuals from non-traditional backgrounds adds a new perspective and point of view that may make problem solving more effective.
- Integrate skilled immigrant women into Quebec's technology workforce. Barriers to integration, including a lack of equivalencies for education, workplace training and experience, prevent skilled newcomers from finding gainful employment. Integration of these women helps resolve labour shortages in the technology sector, and adds to the diversity of workplace problem solving.
- Providing training and development for soft skills in STEM workplaces. Place an equal value on product development and personal development. Well adjusted team members are more productive and cooperative team members.
- Encourage pay equity.
- Encourage formal and informal relationships to encourage women's career development. Mentors that help women navigate through their careers help provide a sense of normalcy and balance. Outside perspective provides a second opinion, and years of workplace expertise.
- Create a workplace culture that encourages the re-integration of mid-career women post childbirth. Offer alternatives that allow both employer and employee to benefit, such as teleworking, part-time work and job-sharing. All require communication and teamwork, a testament to encouraging a shift in workplace culture.
- Judge performance based on output, not workplace presence. Parents and people with personal commitments may not spend 12 hours a day in the office. They, however, may complete their work at home. Discourage the chaotic pace of work in the office; reward task completion – regardless of location.
- Host only courteous workplace events. Not all employees share the same preferences. Events should provide an outlet for entertainment in a safe and relaxing medium for all participants.

Encourage entrepreneurship

- Provide training and funds to support female-led start-ups. Allow women to feel they are competing on even ground.
- Provide access to information about setting up a small technology business. This should range from business planning, accounting to legal and HR issues.
- Support mid-career women and those with families in the pursuit of technology career aspirations. This could include re-entering the workforce in a new capacity or starting a small business.

- Create mentorship programs and networks specifically for female entrepreneurs in technology. Allow women to learn from one another, and access a forum for exchange and support.
- Develop a female-focused Quebec-based funding and accelerator program. Teach women to pitch their business ideas, expand their businesses and find growth solutions appropriate for their businesses and lives.

YES RECOMMENDATIONS

The WIT recommendations provide the basis for YES Montreal's WIT program. Actionable items include:

- Create an Advisory Committee to stimulate female-specific start-up initiatives. Said Committee should include finance specialists, who may highlight the issues associated with demographic-specific funding. The Committee would address the specific needs of female led start-ups.
- Include Quebec educators on the Advisory Committee on the state of women's technological education in Quebec. Said committee should include members of faculty at the primary, secondary and post-secondary levels to discuss issues addressed in the GBA.
- Introduce a Networking and Pitching workshop specifically for women in technology. Ensure counselling and coaching at YES to train women to communicate and promote their competencies and experience more readily.
- Establish and promote successful women with technology careers in Quebec. Create and circulate documentation highlighting a range of women, from entrepreneurs to corporate career women. Demonstrate the breadth and diversity of women in the Quebec technology market by creating role models.
- Implement a WIT specific mentorship program. Match female job seekers and entrepreneurs with Quebec-based professionals.
- Offer networking events and workshops to allow women in technology and female entrepreneurs to connect. Access to support networks allows women to address challenges and share their experiences in a non-judgmental environment.
- Raise awareness within Quebec about the challenges facing women in the technology workplace.

APPENDIX I: GENDER-BASED ANALYSIS & PROCEDURES

In late 2012 YES Montreal launched a 3-year project entitled "Women in Technology". This project works to increase the number of women involved in the fields of technology by applying a gender-based analysis in development and implementation of an advocacy and evaluation program. The project consists of two interconnected parts:

- The production of a GBA research paper; and
- The provision of entrepreneurship, job search and mentorship programs

The overall objectives of the project are:

- To increase the understanding of how gender impacts the uptake, development and commitment of women with careers in technology
- To assist women in the development of their careers by creating guidelines and advocating for change in Montreal's technology sector

Rationale for project

YES Montreal's Women in Technology program and subsequent gender-based analysis is driven by the realisation that:

1. An understanding of gender is central to identifying the nature of problems facing the technology sector and working towards solutions to these problems.
2. Gendered perspectives in technology may not be at the forefront of issues facing private sector leaders. Studying the issues and alerting industry will trigger affirmative action.

The research component of the project intends to:

- Gather information about relevant tools and approaches
- Gather research to support the development of an evaluation tool for the technology sector
- Provide information to the technology sector that will assist with gender analysis and equal opportunity

This research document seeks to provide definitions and clarifications for the relevant key concepts. The objectives of this research include the identification of current GBA research and to help the reader understand the application of GBA.

The research will be used to build capacity within the technology sector and react to GBA in the advocacy, development, implementation and evaluation of WIT programs and services in Montreal.

Requirement for gender-based analysis (GBA) of Quebec's technology sector

Men and women have differing social roles and life experiences, influenced by social, political and economic circumstances. Ideology, culture, gender identity and sexual orientation influence and impact the development of each individual, and must be taken into consideration when assessing the state of affairs in any sector.

Gender

Gender "refers to the roles and responsibilities of women and men that are created in our families, our societies and our cultures. The concept of gender also includes the expectations held about the characteristics, aptitudes and behaviours of both women and men (femininity and masculinity). These roles and expectations are learned. They can change over time and they vary within and between cultures. The concept of gender facilitates gender analysis, revealing how women's subordination is socially constructed. As such, the subordination can be changed or ended. It is not biologically predetermined nor is it fixed forever."[56]

"Gender is a useful concept that can help [us] understand how men and women are socialised to conform to specific and distinct rules of behaviour, and perform certain specific roles, activities and professions. The term 'sex' is used to differentiate between the physical attributes of males and females that make them universally unique in some respects, and this is associated with their reproductive roles." [57]

The following are examples of gender roles:

- Men are more likely to work as engineers or accountants
- Women more likely to work as nurses or teachers
- Men shouldn't cry or show their emotions
- Women should take care of the home and the family

Gender roles are not universal. Instead, they vary from culture to culture.

Sex

"The attributes of sex do not change across time, place, cultures and societies, whereas gender roles, that is the patterns of socialisation and the roles that men and women are trained to perform, outside of the reproductive sphere, do change constantly. "Religious customs, cultural practices, occupations of men and women thus vary from time to time, from one country to another and even one locality to another. This changing aspect of male and female lives, defined by socially determined standards for 'masculine' and 'feminine' behaviour is referred to as 'Gender'."[58]

Furthermore, sex determines the physical ability to give birth and breastfeed children.

Gender Identity vs. Sexual Identity

Understanding "gender identity" is essential to taking an inclusive gender approach to any project and program. Outlining the distinction between "sexual orientation" also referred to as "sexual identity", and "gender identity" helps to understand the varied aspects of gender.

"Sexual identity or sexual orientation refers to our emotional and sexual attractions, sexual behaviours, and identification with a community. We may identify as lesbian, gay, bisexual, queer, or heterosexual."[59]

"Sexual orientation refers to the choice of sexual partner and is distinct from gender identity." [60]

On the other hand, "Gender identity refers to those characteristics that are linked to an individual's intrinsic sense of self that is based on attributes reflected in the person's psychological, behavioural and/or cognitive state. Gender identity may also refer to one's intrinsic sense of manhood or womanhood. It is fundamentally different from, and not determinative of, sexual orientation."[61]

Significance of the concept of gender identity

"Gender identity" is used to explore the ways in which people do not belong exclusively to either the male or female gender. We may think of gender as binary (either male or female), but instead, we must address the potential of overlap. While certain attributes and behaviours are ascribed to boys and girls from birth, gender based analysis asks us to address whether:

- The experiences and feelings of all individuals can be classified into the rigid male and female categories
- Some people embody elements of male and female
- All people embody elements of male and female

Instead of thinking of gender as a binary expression, it may be more accurate to depict gender as a linear expression; individuals exist at varying points, with attributes both male and female.

Oppression and Intersectionality

Gender-based analysis is not achieved by focusing exclusively on women and women-specific concerns. "The commonly held assumption that men are oppressors and women are victims is a simplification of reality, and not helpful in addressing either male or female gender needs in a lasting manner. …. We need to view gender not as a unilateral women's issue but in terms of relations of power and powerlessness in which men as well as women may be vulnerable and disempowered. We need to find constructive ways of working with men to transform power and gender relations without marginalising women." [62]

While men may have more power than women in certain situations, addressing the power imbalance affects men as well as women. This project aims to suggest that women-specific approaches, while valuable in themselves, need to be analysed within a broader gender-based approach.

Gender is a core organising principle of social relations and opportunities. Gender and gender roles and relationships impact all processes of life. In order to better understand and respond to the needs of the technology sector, we must take an integrated approach that addresses the intersection of gender, age, visible minority status, education, language, etc.

Intersectionality is a feminist theory and a methodology for research that operates under the premise that people live multiple, layered identities derived from social relations, history and the operation of structures of power. People are members of more than one community at the same time, and can simultaneously experience oppression and privilege. Intersectional analysis aims to reveal multiple identities, exposing the different types of discrimination and disadvantage that occur as a consequence of the combination of identities.

GBA: Definitions and Purpose

Gender-Based Analysis is prevalent on the international stage. In order to understand the premise under which these studies are conducted, a selection of definitions are drawn from these studies are provided below.

***International Labour Organisation*:**

"Gender analysis is a tool to diagnose the differences between women and men regarding their specific activities, conditions, needs, access to and control over resources, and access to development benefits and decision-making. It studies the linkages of these and other factors in the larger social, economic, political and environmental context. Gender analysis entails, first and foremost, collecting sex disaggregated data and gender-sensitive information about the population concerned. Gender analysis is the first step in gender-sensitive planning for promoting gender equality". [63]

Status of Women Canada:

"[GBA] includes an understanding of the nature of relationships between men and women, and the different social realities, life expectations and economic circumstances facing women and men. It acknowledges that some women may be disadvantaged even further because of their race, colour, sexual orientation, socio-economic position, region, ability, level or age. A gender-based analysis respects and appreciates diversity." [64]

Health Canada, Bureau of Women's Health and Gender Analysis:

"GBA is an analytical tool that systematically integrates a gender perspective into the development of policies, programs and legislation, as well as planning and decision making processes. It helps to identify and clarify the differences between women and men, boys and girls, and demonstrates how these differences affect health status, access to, and interaction with, the health care system." [65]

As represented above, GBA definitions as presented above share commonalities:

1. The definitions focus on men/boys' and women/girls' needs and relationships
2. Rarely is the concept of gender identity and sexual orientation addressed; when these concepts are referred to, they are regarded as added variables (similar to age, or economic status).

Role of Socioeconomics in GBA

Gender analysis questions the distribution of resources along with the impact of culture and traditions. By addressing how an initiative can impact women and men, GBA challenges existing gender divisions of labour, economic disparities and promotes equality.

Domestic contributions frequently go unrecognised as economic contribution. Work within the home, such as childcare and domestic labour, does not fit within conventional moneymaking structures. As a result, this type of work is underrepresented in official statistics, and undervalued by society as a whole.

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www.yesmontreal.ca
514.878.9788
666 Sherbrooke St. West, Suite 700
Montreal, Quebec H3A 1E7

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