Breaking barriers: valuing women in IT

Guide for educational organizations

LE CODE lcdf DES FILLES

Acknowledgements

Advancing diversity and gender equality in the technology sector is a collective mission, and your commitment to sharing this crucial knowledge reflects your support towards a more inclusive and equitable future.

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We would also like to thank the Observatoire québécois des inégalités, who shared its expertise and research resources to develop and strengthen the impact of this guide. Let us continue to work together to create a digital environment where every individual, regardless of gender, can evolve and thrive in a meaningful way.

Finally, a big thank you to you, dear readers. Your commitment to inclusion and your desire to move our industry towards gender parity are the driving force behind this initiative.

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Introduction

The information technology (IT) and digital sectors represent a substantial part of the Quebec economy. This booming sector positions Quebec as a **leader on the world** stage. Despite the prosperity and importance of the IT and digital industry, the representation of women... needs a serious shake-up!

The gender gap is glaring, with only 24% of IT positions in Quebec filled by women in 2022.

This disparity manifests itself right from the school career: girls account for only a fraction of enrolments in technical college programs in electronics and computer science, and not even a quarter of enrolments in bachelor's degrees in computer science.

This under-representation of female talent is not only an equity issue, but also a disincentive to creativity and business performance.

This guide is intended to...

The aim of this guide is twofold: **to facilitate the integration of women into the IT** and digital sector, and **to strengthen their retention**.

To achieve these goals, the following pages will:

- provide a detailed analysis of the specific challenges faced by young women in the IT and digital sectors;
- feature testimonials that highlight the needs and experiences of female professionals in these fields;
- present proven strategies and innovative approaches for the inclusion and retention of young women in IT and digital-focused educational environments.

This guide is the fruit of a collaborative approach. Based on an exhaustive review of current literature, it also incorporates the valuable insights gleaned from two meetings totalling over four hours of discussion with women from the professional and educational worlds.

These dialogues were essential in capturing women's experiences and, more importantly, in identifying concrete strategies that employers can adopt.

A few definitions

This section clarifies the key terms that will be used throughout the guide.

When we talk about the world of IT and digital... what exactly are we talking about?

The world of information technology, commonly referred to as IT, is a broad one! It encompasses all the activities and professions associated with creating, processing, managing, transmitting, and securing digital information. This sector is ubiquitous and vital to almost all other areas of activity, such as finance, health, education, and many others, making IT skills highly sought-after.

The routes to IT careers are diverse, via university programs in computer science, engineering, or science, but also via specialized technical training, online courses, or certifications. Career opportunities in IT are many and varied, ranging from software development and data analysis to project management and technical support.

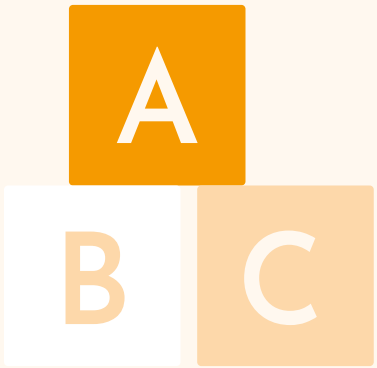
Gender stereotypes

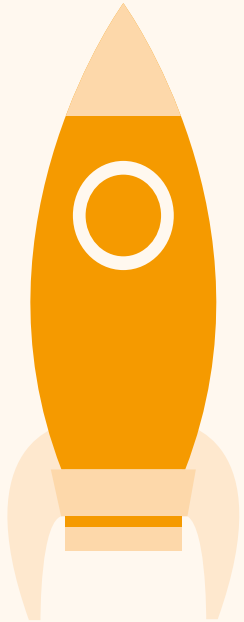
Gender stereotypes are generalized beliefs about the attributes, differences and roles traditionally associated with men and women. They are r**ooted in culture and often conveyed from an early age**.

A classic example of these stereotypes can be seen in the color of children's clothing and the types of toys they play with. Traditionally, pink is attributed to girls, accompanied by toys such as dolls and kitchenettes, while blue is reserved for boys, associated with toys such as tools and cars.

These choices are not insignificant; they **reflect and reinforce societal expectations of gender**, and unconsciously prepare children to adopt specific social roles.

In the workplace, gender stereotypes can influence expectations of job performance, career choices and team dynamics, often to the detriment of inclusion and professional equity for women and gender minorities.





Canada's Equity, Diversity and Inclusion (EDI) policy

Canada's Equity, Diversity and Inclusion (EDI) policy reflects the country's commitment to promoting these principles in workplaces, educational institutions and government agencies.

Equity

Equity is the principle of justice that aims to **recognize each person according to their specific needs** and adjust treatment to balance differences.

Diversity

Diversity refers to the **presence of a wide range of human differences** within an organization or community. It manifests itself in the integration of people of diverse genders, ages, religions, ethnicities, sexual orientations, and life experiences.

Inclusion

Inclusion ensures that **people from diverse backgrounds feel welcomed, respected, and valued** for their unique contribution. It is the active creation of a work environment where diverse perspectives and talents are encouraged, and where everyone can participate fully in creating shared success.

In terms of EDI policy implementation, the Canadian government has taken several initiatives, such as the Employment Equity Act, aimed at improving access to and participation in the labour market. Today, many government agencies require that funded projects consider and integrate EDI principles into their research and practices.

In the workplace, EDI serves to create equal conditions so that everyone can access the same opportunities for development and promotion, regardless of gender, ethnic origin, or other discriminating factors.

Intersectionality and gender-based analysis plus (GBA+)

Intersectionality

Intersectionality is a theory rooted in evidence that asserts that individuals are affected by several aspects of their identity which, when added together, create unique modes of discrimination and privilege. For example, the reality of a woman of color is not comparable to that of a white man or woman because of the potential discrimination linked to both her gender and her ethnic origin.

Gender-based analysis plus (GBA+)

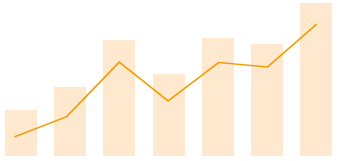
Gender-based analysis plus (GBA+) is a policy analysis practice that builds on the principle of intersectionality but is specifically oriented towards policies and programs. GBA+ is used to ensure that policies and programs are designed to consider the potential impacts on different population groups, to promote greater equity.

Portrait of women and girls in Quebec's IT and digital sector

The IT sector, an important part of our economy

The technology and digital sector is booming and occupies a major place in the Quebec economy. The sector alone accounts for over **3% of the job market and practically 5% of GDP**[1].

The information and communications technology (ICT) industry employs nearly 137,000 workers in Quebec, generates revenues of close to $32.5 billion, and is the source of nearly $1.7 billion in annual investment in research and development[2].



What's more, it positions Quebec **as a world leader in several digital fields**, including video games, artificial intelligence, and special effects.

The IT sector, the female under-representation

While the digital and technology sector is doing well in Quebec, it does have its dark side. Women are **significantly under-represented in the industry**.

Not only are they under-represented in the job market, but they are also under-represented in educational training associated with the technology and digital fields.

For example, in a study conducted by the Conseil supérieur de l'éducation (2020)[3], we learned that women accounted for only 6% of college enrolments in electronics and computer technology in Quebec.

At the bachelor's level in computer science, the proportion of women was only 19% in Quebec, the lowest percentage for all pure and applied science fields combined.

As a result, by 2022, women will account

for just 24% of the ICT[4] workforce.

The under-representation of women in the technology and digital fields can be explained by two phenomena. The first concerns the way in which girls are socialized throughout their education, and the second concerns the way in which the job market welcomes women in the technology and digital fields.

Stereotypes that make life hard for girls

Careful what we value

The environment in which children grow up influences their career choices and future aspirations[5]. From an early age, girls are confronted with numerous gender stereotypes that can discourage their interest and perseverance in certain fields, notably information technology (IT) and digital technology.

In the educational context, gender stereotypes profoundly shape the aspirations and commitments of young students. Girls are often socialized into roles traditionally associated with care and relationships, which steers them towards disciplines perceived as more in line with these roles, such as health sciences or education, rather than the digital field. This stigmatization begins in childhood and persists throughout their academic careers.

For example, girls may be discouraged from participating in programming clubs or exploring computer science courses, as these fields are often perceived and presented as predominant male[6].

Gender stereotypes are also reflected in the way the digital industry targets its clientele.

To attract young people's interest, the video game industry has been the focus. The latter targets a predominantly male audience, reinforcing the idea that IT and digital are masculine[7] spheres.

This early influence leads to boys' familiarity and ease with digital technologies, making them more inclined to enroll in these fields.

> ***Because we socialize girls to like helping out and dealing with people, they apply to jobs that cater to that, like teacher, nurse, doctor. We never present the digital environment as a whole and its possibilities. It's so much more than just sitting in front of your computer all day or playing video games!***
>
> *- Female development director*

Stereotypes shared despite our best efforts

Gender stereotypes also influence **the attitudes of other students and even teachers**. Female students, for example, are perceived by their male counterparts as underperforming, despite having equivalent or even higher-grade point averages. Teachers may unwittingly offer girls less support and resources in these areas[8].

Over time, these attitudes and prejudices continue to manifest themselves as girls progress in their education, even once they reach university.

> ***To get the word out about the digital scene, millions of dollars were invested in marketing video games to boys. It was done in a very gendered way. I think a lot of those boys become adept with a computer for that reason, and not necessarily the girls.***
>
> *— Female development director*

Unattractive career paths for girls

Low salaries, lack of women in management positions, sexist climate... the under-representation of women in the IT and digital fields is explained, among other things, by less attractive career advancement prospects for girls.

In the IT sector, because of the way we are socialized, men's skills are often valued more highly, even when women have equivalent qualifications and skills[9]. This unconscious preference leads to under-representation of women in management positions[10], lower pay[11] and fewer female role models and mentors for the next generation.

Women in IT are also subject to higher performance standards than their male counterparts, requiring them to make extra efforts to prove their competence.

Moreover, work-life balance is a major challenge for women in IT, often exacerbated by domestic mental burdens. Career interruptions due to family obligations can lead to a loss of skills and qualifications, making professional reintegration more complicated.

These phenomena have a significant impact on diversity and inclusion in the IT and digital sector[12]. Due to gender biases, girls are discouraged from entering these fields from an early age and are therefore less likely to pursue careers in these sectors.

The current work environment also has a discouraging impact on women considering a career in IT, as opportunities for advancement are less attractive and barriers more numerous.

One study on this subject was conducted by Professor Corinne Moss-Racusin of Yale University in 2012. This study showed that identical CVs were judged differently depending on whether the candidate's name was male or female, with a marked preference in favor of male candidates.

Possible solutions

Attracting more women and improving their retention in the IT and digital world is essential, as the benefits of a diverse workforce are undeniable!

Did you know?

In 2017, a study found that companies that promoted gender diversity were 21% more likely to achieve above-average profitability, compared to those that were less diverse!

Studies show, for example, that inclusive and gender-diverse teams are **more innovative and successful**. IBM is an eloquent example, having seen its revenues increase considerably after integrating diversity and inclusion into its corporate strategy[13].

According to a survey of 1,800 professionals[14], companies with diversified teams are 45% more likely to report an **increase in market share** over the previous year. Moreover, they are 70% more likely to report that their company has succeeded in **conquering new markets**.

Besides, an estimated 61% of women consider gender diversity within management teams when choosing their workplace[15]... All these reasons demonstrate that it is vital to ensure diverse and equitable representation in the IT and digital world.

Fortunately, there are several ways in which this can be achieved!

Gender socialization is everyone's business!

Gender roles are a social construct. The more we nurture them, the more important they will be in the way children and adults behave.

Acting on how they can shape the future of young girls is vital to ensure a more egalitarian representation in the IT and digital world.

Self-esteem awareness

Studies have shown that between the ages of 8 and 14, girls' self-esteem drops significantly (by up to 30%) compared to boys[16].

This worrying trend can be countered by integrating self-esteem awareness programs into girls' school curricula from an early age.

By boosting their confidence, these programs will help them to persevere in all areas, including those traditionally associated with men.

Teacher training

Providing training for teachers and all adults involved in students' daily lives on gender stereotypes and their impact on education.

Making them aware of the importance of promoting gender equity and creating an inclusive classroom environment. This can be done by integrating educational modules on gender stereotypes into the school curriculum, avoiding gender stereotypes in games, highlighting their impact on career choices, and encouraging students to question these stereotypes.

Careful use of language

To counter gender stereotypes, it is essential to avoid the use of expressions that reinforce these prejudices, while promoting egalitarian communication.

For example, the comment «You're good for a girl» may seem like a compliment at first glance, but it unconsciously conveys the idea that girls are less competent than boys in a particular field.

Girls need to be told very early on that they are capable, that they should hold their heads high and believe in their abilities. From childhood onwards, that's when it all comes down to it, and there's a lot of work to be done at that stage. If that's done, then the rest almost becomes superfluous!

— Female junior developer

I have a 5-year-old daughter, and I've never said to her: 'You can be an astronaut if you want to, even if you're a girl'... I don't like the phrase 'even if you're a girl', because it implies that there's a difference. You can be an astronaut, period!

— Female development director

Opportunity education

There's more to IT and the digital world than video games! Informing students about the diversity of career opportunities is essential to make them dream and help them project themselves in this field.

Furthermore, highlighting successful female role models in these fields is an effective way of showing that these careers are not reserved exclusively for boys.

Essential elements to be integrated into the school career

> ***Offering after-school workshops just for girls is fine, but it just attracts girls who already have that interest. I think it takes basic courses so that everyone, at least once in their career, can be introduced to the IT and digital field.***
>
> *— Female development director*

Early introduction to IT for every student

It's essential to offer introductory courses in IT from an early age, accessible to all students, to demystify technology and generate general interest. This approach will enable both girls and boys to discover the field of IT and the digital world in an inclusive way.

There are many possible resources in the form of activities, games... focusing on creativity and fun will help generate interest and

Technology training for teachers

Ongoing training programs for all teaching staff will enable them to familiarize themselves with technological tools. This will help create an educational environment where, for example, teachers feel comfortable with technology, thus positively influencing their students.

«Young people need to be exposed to digital technology as early as possible, and there need to be compulsory courses at all levels. To stimulate interest, but also democratize the field: it's for everyone!»

— Full Professor of computer science

Compulsory programming courses in the science curriculum

Introducing compulsory programming courses in the science curriculum up to college level. This will ensure that every student, regardless of gender, not only acquires fundamental programming skills, but also could develop an interest in programming.

Conclusion

This guide aims to raise awareness and inform educational organizations about the importance of promoting the inclusion and advancement of girls and women in the digital and information technology (IT) fields.

It's essential to recognize that girls and women face specific challenges that affect their educational and career paths in this sector, ranging from gender stereotypes to work-family balance and a sexist climate.

However, it's crucial to stress that solutions do exist. By promoting egalitarian gender socialization and integrating essential elements into the school career to encourage girls' interest in IT and digital technology, we can help create a more inclusive and balanced sector.

By putting these recommendations into practice, it is possible to create a future where girls and women are fully represented, valued, and fulfilled in the ever-evolving field of digital and information technology.

It's time to work together to make equity and inclusion a reality for everyone interested in this promising sector!

«By making this kind of effort at work, it shows that women are considered, that they can exist in this environment. In the subconscious, it adds a lot of value for us!

— Project manager

Checklist

Under-valuing girls' skills

Self-confidence workshops for girls
Opting for non-sexist, non-stigmatizing language
Inviting/presenting inspiring female role models in girls' academic training
Raising awareness among teachers and students to gender stereotypes

Let's break down barriers together!

Lack of understanding of the IT and digital world

At least one compulsory course in computer science in the science curriculum up to CEGEP level
Presentation of job opportunities in IT and digital technology
Creative computer workshops for primary and secondary school students
Inviting IT and digital professionals to primary and secondary school classes to talk about their career paths

Culture masculine / boys club

Creative computing workshop for primary and secondary school students
Opting for inclusive language
Featuring women in the promotion of academic programs
Promoting women leaders and executives

End notes

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