

Trends in STEM and BHASE graduates from public postsecondary institutions across Canadian provinces and territories

2010 to 2018



cmec

Council of
Ministers
of Education,
Canada

Conseil des
ministres
de l'Éducation
(Canada)

Introduction

The demand for science, technology, engineering, mathematics, and computer and information sciences (STEM) skills in the labour force has been rising for decades as STEM-related occupations in Canada have been growing faster than those in any other field since 1990¹. Excluding management professions, STEM-related jobs have been the highest paid for many years², thus increasing the attractiveness of these fields to postsecondary students.

Stimulated by a labour market driven by technological change, the growth of STEM-related occupations, and consequently the demand for STEM-educated workers, is expected to continue. Despite the growing popularity of STEM skills, the underrepresentation of female graduates in STEM programs persists³. Another barrier to women fully participating in this growing field is the gender salary gap, which remains wider in STEM occupations than in non-STEM related occupations⁴.

STEM fields include the following three sub-groups: “science and science technology”, “engineering and engineering technology”, and “mathematics and computer and information sciences”. Non-STEM fields are categorized under the term BHASE, which stands for “business, humanities, health, arts, social science, and education”, and specifically includes “business and administration”, “arts and humanities”, “social and behavioural sciences”, “legal professions and studies”, “health care”, “education and teaching”, and “trades, services, natural resources and conservation”. The STEM and BHASE fields are drawn from the variant of Statistics Canada’s 2016 Classification of Instructional Programs (CIP)⁵.

This fact sheet examines postsecondary graduates⁶ from both STEM and BHASE fields of study from 2010 to 2018 in Canadian provinces and territories. The first section provides an overview of the growth of STEM graduates in Canada. The subsequent sections address gender trends in STEM, graduates across levels of education and institution types, the age of graduates, and international graduates⁷. Finally, the last section compares graduate data for Canadian provinces and territories to international data across OECD countries.

¹ According to data from the Labour Force Survey, the number of people working in science and technology occupations (NOC broad category 2) rose by 129% from 1990 to 2019 (or a 2.9 percent compound annual growth rate), a larger increase than for any other broad occupational grouping (see [Table 14-10-0335-01 Labour force characteristics by occupation, annual](#)).

² Source: [Statistics Canada. Table 14-10-0340-01 Employee wages by occupation, annual](#)

³ See “Persistence and representation of women in STEM programs”: <https://www150.statcan.gc.ca/n1/pub/75-006-x/2019001/article/00006-eng.htm>

⁴ See “Is field of study a factor in the earnings of young Bachelor’s degree holders?”: <https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016023/98-200-x2016023-eng.cfm>

⁵ See Variant of CIP 2016 — STEM and BHASE groupings: <https://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=401856>

⁶ Students who received a credential, such as a certificate, diploma, or degree, from a public Canadian postsecondary institution

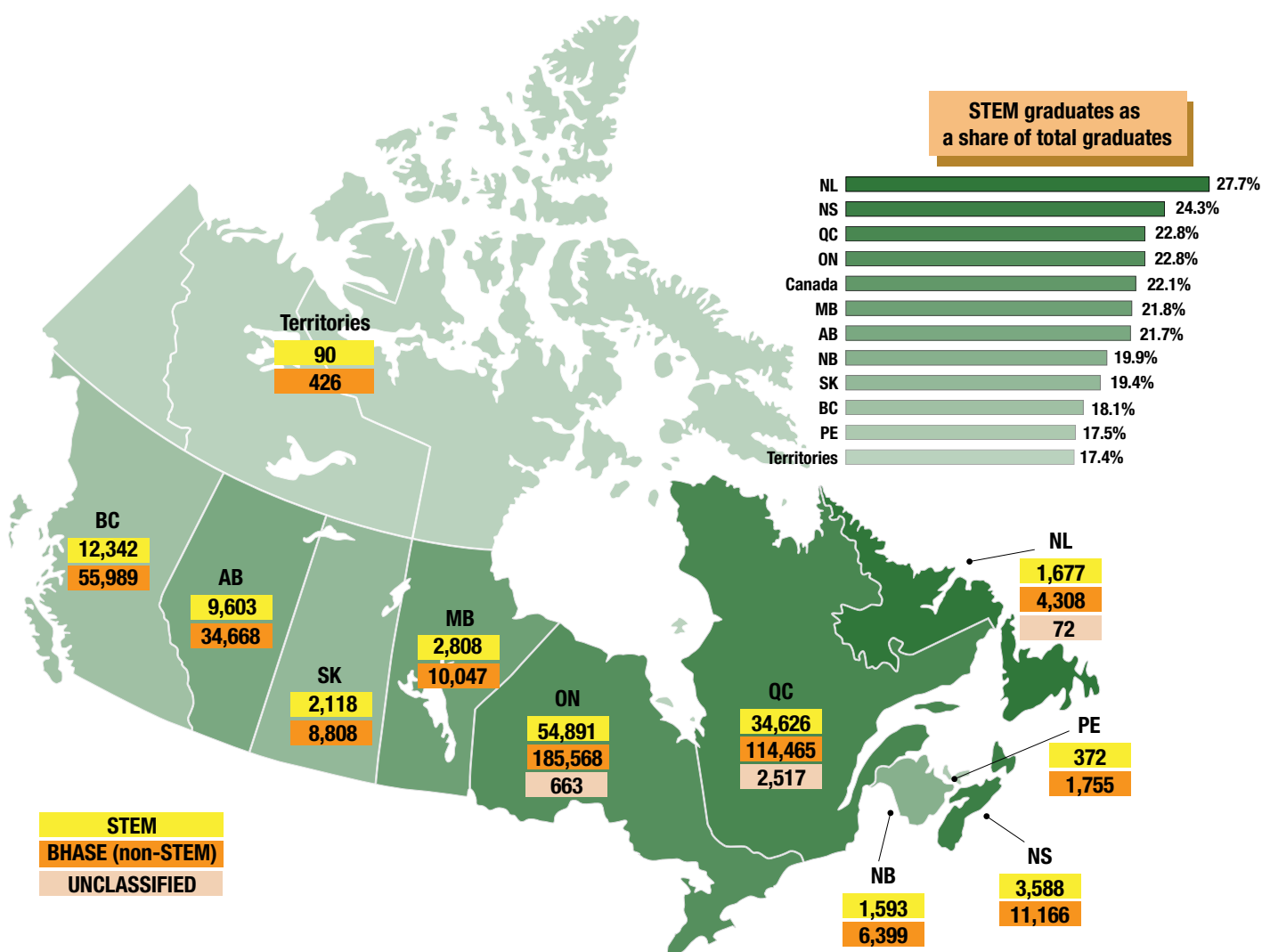
⁷ Those are the main data elements collected by PSIS. See Postsecondary Student Information System (PSIS) Record Layout, Files, and Data Element Descriptions: https://www.statcan.gc.ca/eng/statistical-programs/document/5017_D1_V4

The growth of STEM graduates in Canada

In Canada, from 2010 to 2018, the number of STEM graduates grew from 82,089 to 123,708, a 51 percent increase, while the number of BHASE graduates showed a 20 percent increase, rising from 361,758 to 433,599^{8,9}. In 2018, the shares of STEM graduates among total graduates were highest in Newfoundland and Labrador and Nova Scotia with 28 percent and 24 percent, respectively. These shares were the lowest in the territories¹⁰ and in Prince Edward Island at approximately 17.5 percent (Chart 1.1).

CHART 1.1

Number of graduates, STEM and BHASE (non-STEM), provinces and territories, 2018



Source: Postsecondary Student Information System (PSIS)

⁸ It should also be noted that 3,252 graduates in Canada followed an instructional program that could not be classified within the primary groupings of the CIP in 2018, thus those programs have been categorized as “unclassified”.

⁹ In parallel, the number of students who enrolled in STEM programs increased by 35 percent between 2010–11 and 2018–19, while the number enrolled in BHASE programs grew by 4 percent. See [Table 37-10-0163-01 Postsecondary enrolments, by International Standard Classification of Education, institution type, Classification of Instructional Programs, STEM and BHASE groupings, status of student in Canada, age group and gender](#)

¹⁰ Data for Yukon, Northwest Territories, and Nunavut are combined under “Territories”.

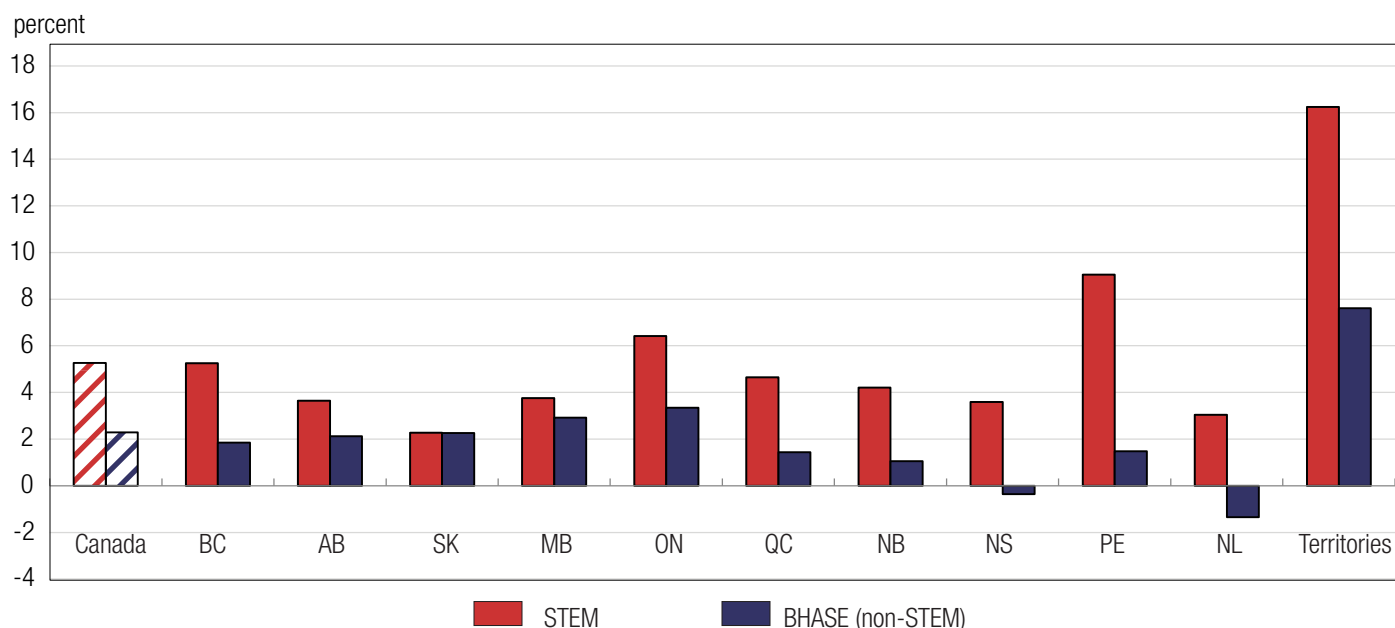
While an upward trend can be observed for both STEM and BHASE graduates between 2010 and 2018, the number of STEM graduates has increased at a higher rate. During this period, the growth of STEM graduates in Canada was 51 percent, resulting in a 5.3 percent compound annual growth rate (Table 1.1 and Chart 1.2). However, this growth of STEM graduates varied among provinces, ranging from 20 percent in Saskatchewan (or a 2.3 percent compound annual growth rate) to 100 percent in Prince Edward Island (or a 9 percent compound annual growth rate).

In comparison, the compound annual growth rate was 2.3 percent for BHASE graduates in Canada. While the overall growth of BHASE graduates was 20 percent in Canada, the number of BHASE graduates decreased in Nova Scotia and in Newfoundland and Labrador by 3 percent and 10 percent, respectively. Ontario demonstrated the highest increase in the number of BHASE graduates among provinces with growth of 30 percent (Chart 1.2 and Table 1.2).

Overall, the number of STEM or BHASE graduates in Canada increased every year between 2010 and 2018 except between 2015 and 2016 when the number of students graduating from a BHASE field slightly decreased by 1.3 percent.

CHART 1.2

Compound annual growth rate¹ (%), STEM and BHASE (non-STEM) graduates, Canada, provinces and territories, 2010 to 2018



¹ The compound annual growth rate formula calculates the growth of graduates between 2010 and 2018, assuming the growth is compounded annually.

Note: The bars representing Canada are filled with a diagonal line pattern to make them easier to find.

Source: Postsecondary Student Information System (PSIS).

TABLE 1.1
Number of STEM graduates^{11,12}, Canada, provinces and territories, 2010 to 2018

	STEM		
	2010	2018	percentage change
Territories	27	90	 233%
PE	186	372	 100%
ON	33,357	54,891	 65%
Canada	82,089	123,708	 51%
BC	8,193	12,342	 51%
QC	24,084	34,626	 44%
NB	1,146	1,593	 39%
MB	2,091	2,808	 34%
AB	7,209	9,603	 33%
NS	2,706	3,588	 33%
NL	1,320	1,677	 27%
SK	1,770	2,118	 20%

Note: Provinces and Territories are sorted by percentage change.

Source: Statistics Canada. [Table 37-10-0164-01 Postsecondary graduates, by International Standard Classification of Education, institution type, Classification of Instructional Programs, STEM and BHASE groupings, status of student in Canada, age group and gender](#)

TABLE 1.2
Number of BHASE (non-STEM) graduates^{13,14}, Canada, provinces and territories, 2010 to 2018

	BHASE (non-STEM)		
	2010	2018	percentage change
Territories	237	426	 80%
ON	142,626	185,568	 30%
MB	7,980	10,047	 26%
Canada	361,758	433,599	 20%
SK	7,362	8,808	 20%
AB	29,295	34,668	 18%
BC	48,348	55,989	 16%
PE	1,560	1,755	 13%
QC	102,171	114,465	 12%
NB	5,886	6,399	 9%
NS	11,490	11,166	 -3%
NL	4,803	4,308	 -10%

Note: Provinces and Territories are sorted by percentage change.

Source: Statistics Canada. [Table 37-10-0164-01 Postsecondary graduates, by International Standard Classification of Education, institution type, Classification of Instructional Programs, STEM and BHASE groupings, status of student in Canada, age group and gender](#)

¹¹ All counts are randomly rounded to a multiple of 3 using the following procedure: counts that are already a multiple of 3 are not adjusted; counts one greater than a multiple of 3 are adjusted to the next lowest multiple of 3 with a probability of two-thirds, and to the next highest multiple of 3 with a probability of one-third. The probabilities are reversed for counts that are one less than a multiple of 3.

¹² Totals may not add up to the sum of all categories due to rounding.

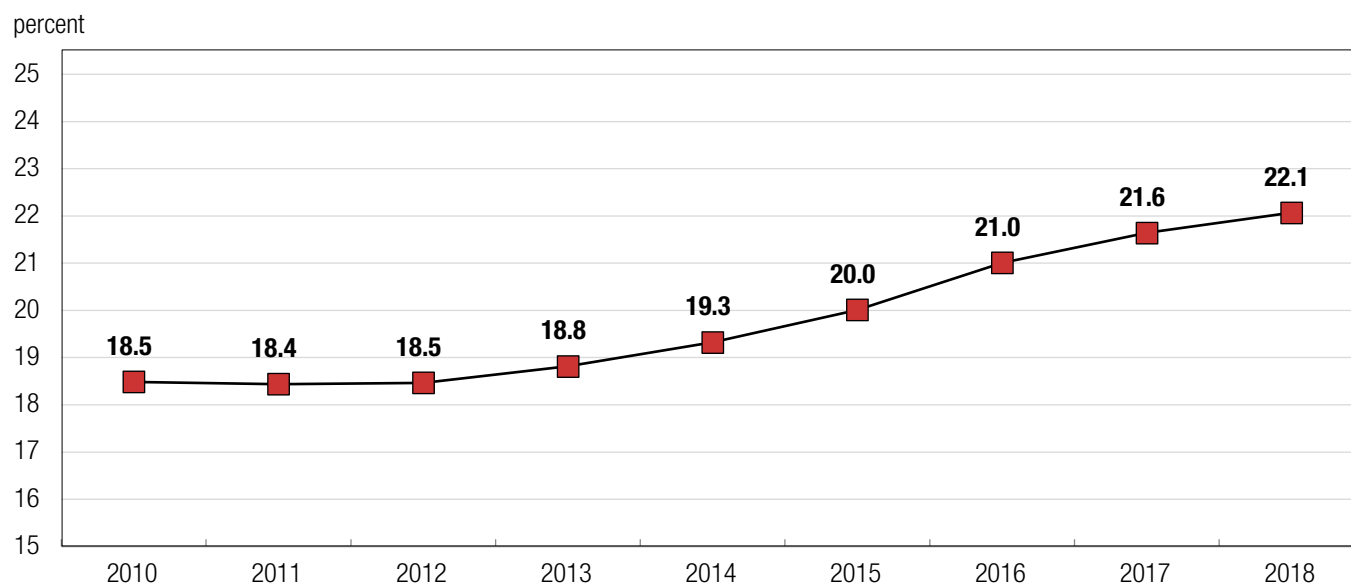
¹³ All counts are randomly rounded to a multiple of 3 using the following procedure: counts that are already a multiple of 3 are not adjusted; counts one greater than a multiple of 3 are adjusted to the next lowest multiple of 3 with a probability of two-thirds, and to the next highest multiple of 3 with a probability of one-third. The probabilities are reversed for counts that are one less than a multiple of 3.

¹⁴ Totals may not add up to the sum of all categories due to rounding.

Looking at the historical share of graduates by field of study is an alternative way to measure and compare the rate by which the number of graduates has increased for STEM and BHASE groupings.

In 2010, 18.5 percent of students graduated from a STEM field and this number has gradually increased by 3.6 percentage points to reach 22.1 percent in 2018 (Chart 1.3). The rate at which STEM graduates increased differs among provinces. While the number of STEM graduates was similar between 2010 and 2018 in Saskatchewan, the difference in the share of STEM graduates was over 5 percentage points in Newfoundland and Labrador, Nova Scotia and Prince Edward Island.

CHART 1.3
Share of graduates who studied STEM (%), Canada, 2010 to 2018



Source: Postsecondary Student Information System (PSIS)

In Canada, all STEM and all but one BHASE subfields of study showed an increase in the number of graduates from 2010 to 2018. The BHASE subfield of study “education and teaching” was the only one where the number of graduates fell from 32,544 to 28,608, a 12 percent decrease.

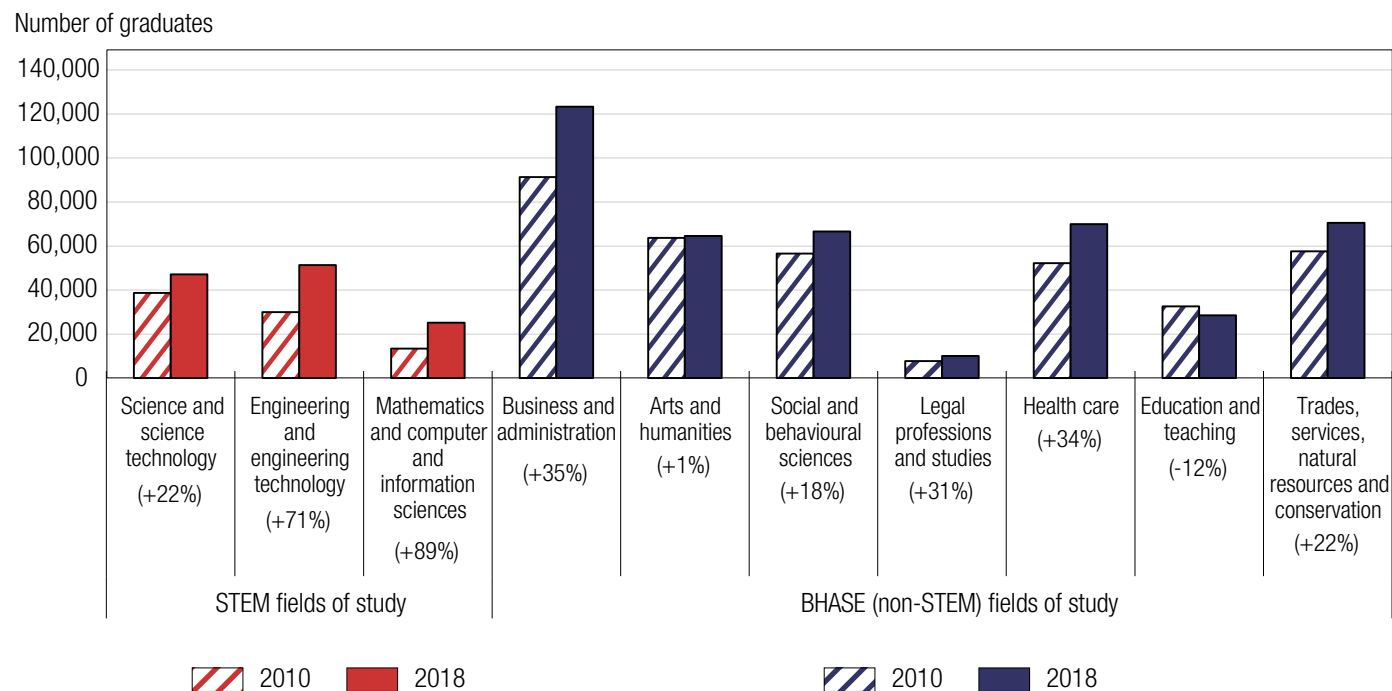
Two STEM subfields, “mathematics and computer and information sciences” and “engineering and engineering technology”, reported the largest increase in the number of graduates from 2010 to 2018 (89 percent and 71 percent respectively). However, in 2018, there were still more total graduates in 5 of the 7 BHASE subfields of study than in any of the 3 STEM subfields (Chart 1.4). In 2018, the BHASE subfield of study with the largest number of graduates (123,300) was “business and administration”, which represented 22 percent of all graduates.

Among provinces, the subfield of study with the largest increase in the number of graduates was “mathematics and computer and information sciences”, where the number of graduates more than doubled between 2010 and 2018 in New Brunswick (120 percent growth), Manitoba (117 percent growth) and Ontario (114 percent growth).

In contrast, the number of graduates in “education and teaching” in Ontario decreased between 2010 and 2018 from 12,456 to 7,494 graduates, a 40 percent decrease, which was the largest decline among provinces within the BHASE subfields of study¹⁵. The second largest decrease was in Nova Scotia where graduates in “arts and humanities” decreased by 37 percent, from 1,329 to 834 graduates.

¹⁵ The length of teacher training in Ontario doubled from one year to two which explains the decrease in the number of graduates in “education and teaching” in 2015-2016 and later.

CHART 1.4
Number of graduates, field of study (% change), Canada, 2010 and 2018



Source: Postsecondary Student Information System (PSIS)

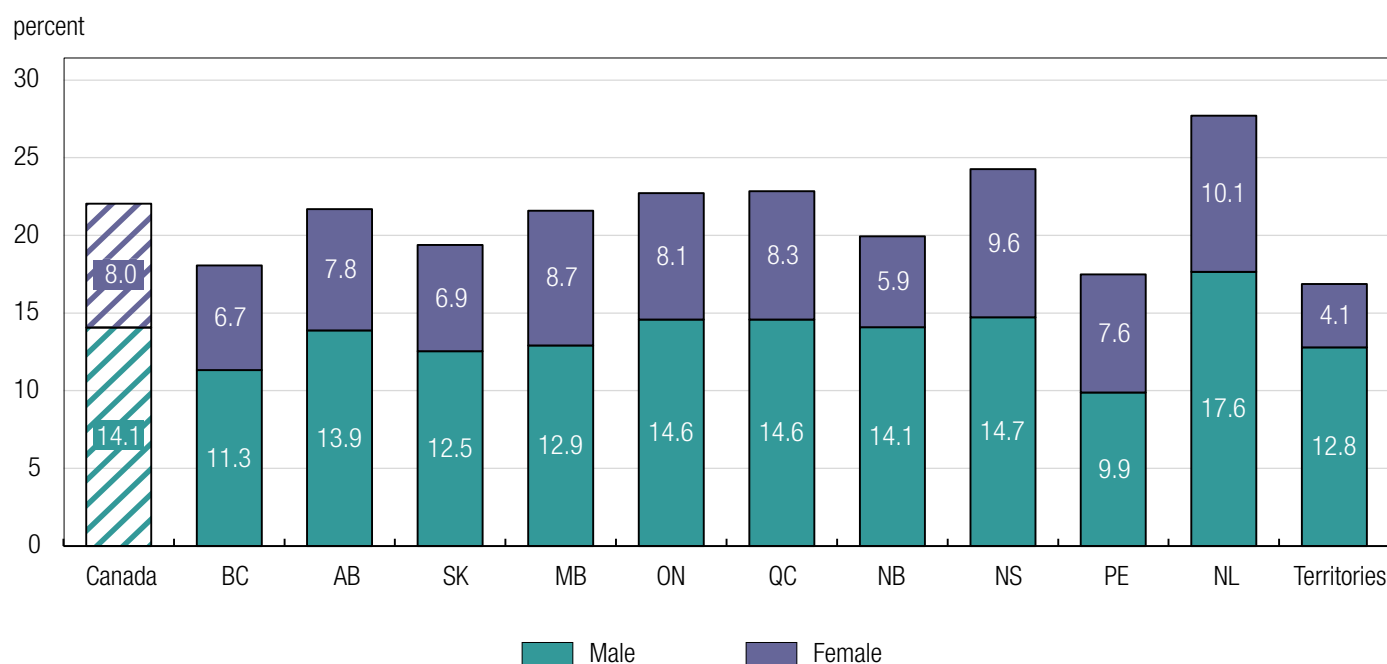
Exploring gender trends in STEM

Female graduates are under-represented in STEM programs. In 2018, of the 22.1 percent of students who graduated in a STEM program in Canada, 14.1 percent were male and 8 percent were female (Chart 2.1).

Among provinces, Newfoundland and Labrador and Nova Scotia had the highest share of female STEM graduates with approximately 10 percent each of total STEM and BHASE graduates. New Brunswick had the lowest share at 5.9 percent. While the gender difference was nearly 6 percentage points at the Canada level, it ranged from 2 percentage points in Prince Edward Island to 8 percentage points in New Brunswick.

Focusing on STEM fields only, the share of female graduates was 36 percent across provinces. This share was at or above 40 percent in Manitoba and in Prince Edward Island, and was the lowest in New Brunswick at 29 percent.

Between 2010 and 2018, the number of female STEM graduates increased from 30,393 to 44,769, representing growth of 47 percent. However, the number of male STEM graduates grew at a faster rate, 53 percent, from 51,573 to 78,807, which could help to explain why the gender gap between male and female STEM graduates in Canada was 1.3 percent higher in 2018 than in 2010. The total share of female STEM graduates decreased from 37 percent to 36 percent in that time period.

CHART 2.1**STEM graduates as a share of total graduates (%), gender, Canada, provinces and territories, 2018**

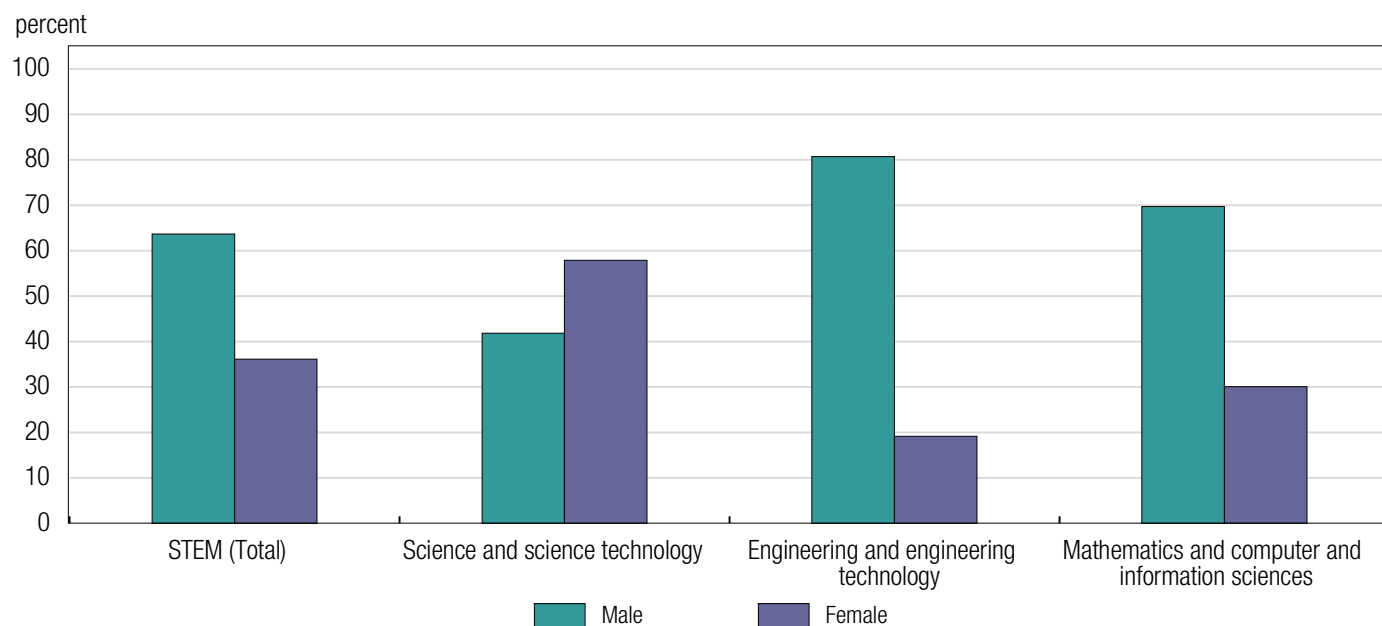
Note: The bars representing Canada are filled with a diagonal line pattern to make them easier to find.

Source: Postsecondary Student Information System (PSIS)

Nonetheless, over the same time period, the share of female graduates grew by at least 2 percentage points in all STEM subfields. The gender distribution of STEM graduates in 2018, total and subfields, is shown in Chart 2.2. It is important to note that the gender distribution of graduates varied across the three STEM fields of study. Although female graduates represented 57 percent of the total postsecondary graduates in 2018, they were significantly under-represented in the fields of “engineering and engineering technology” (19 percent), and “mathematics and computer and information sciences” (30 percent). Conversely, the share of female students graduating in “science and science and technology” was similar to the share of female graduates in any field (58 percent). This trend could partly explain the gender salary gap as earnings are higher for graduates with an “engineering and engineering technology” degree and for graduates who studied “mathematics and computer and information sciences”¹⁶.

¹⁶ See “Is field of study a factor in the earnings of young Bachelor's degree holders?": <https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016023/98-200-x2016023-eng.cfm>

CHART 2.2
Gender distribution in STEM subfields, STEM graduates, Canada, 2018



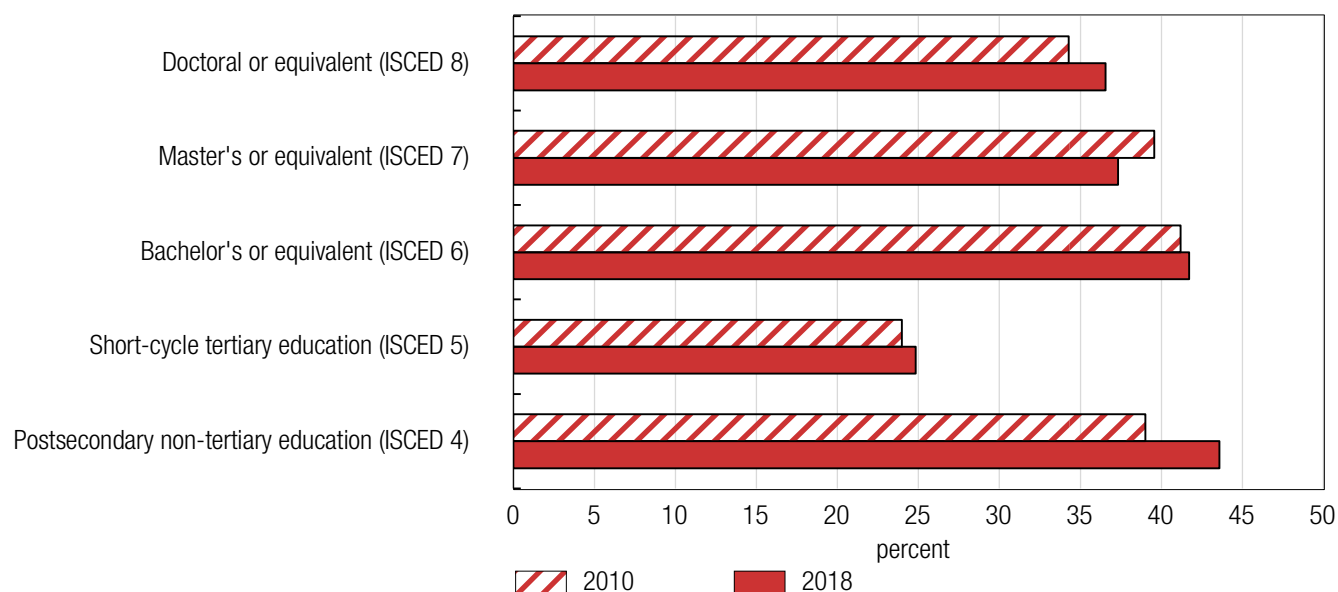
Source: Postsecondary Student Information System (PSIS)

The share of female STEM graduates as a proportion of total STEM graduates also varies among levels of education. In 2018, this share was the lowest for females attaining a STEM short-cycle tertiary program (ISCED 5¹⁷), at 25 percent. However, the number of female STEM graduates attaining this level of education has more than doubled since 2010.

In contrast, the share of female STEM graduates as a proportion of total STEM graduates was the highest at the postsecondary non-tertiary level (ISCED 4) at 44 percent, up 4.5 percentage points since 2010. Though the number of female graduates attaining a STEM postsecondary non-tertiary program decreased between 2010 and 2018, this occurred at a lower rate than for male graduates.

The share of female STEM graduates decreased by 2 percentage points at a Master's or equivalent level (ISCED 7) between 2010 and 2018, and remained stable at the short-cycle tertiary (ISCED 5) and at Bachelor's or equivalent (ISCED 6) levels (Chart 2.3).

¹⁷ See International Standard Classification of Education, ISCED 2011, UNESCO, <http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf>

CHART 2.3**Female STEM graduates as a share of total STEM graduates, level of education, Canada, 2010 and 2018**

Source: Postsecondary Student Information System (PSIS)

What can PISA data tell us about the STEM graduate gender gap?

The Programme for International Student Assessment (PISA)¹⁸ is an international assessment of the skills and knowledge of 15-year-old students; in addition, it provides information about a range of factors that contribute to the success of students, schools, and education systems. PISA is a collaborative effort among member countries of the Organisation for Economic Co-operation and Development (OECD), and participating countries and economies. As PISA is an international assessment, it measures skills that are generally recognized as key outcomes of the educational process. Rather than testing on knowledge of facts, the assessment focuses on young people near the end of compulsory schooling and their ability to use their knowledge and skills to meet real-life challenges.

As a result, when looking at students' expectations about their future, PISA data can provide some insights on the anticipated postsecondary pathways of 15-year-olds, and their distribution between male and female students. For example, PISA 2018 data show that almost 20 percent of Canadian 15-year-old students reported that they expect to work as science and engineering professionals, ICT professionals, or science-related technicians and associate professionals when they are 30 years old¹⁹. However, the difference between female and male students was significant: 28 percent of boys self-reported that they expect to work in one of those science-related occupations compared with only 11 percent of girls.

In addition, when focusing on top performers²⁰ in science or mathematics, 23 percent of Canadian 15-year-old students self-reported that they expect to work as science and engineering professionals when they are 30 years old²¹. The difference between top-performing boys and girls is also significant, with a 17-percentage point difference in favour of top-performing boys (31 percent compared with 14 percent for top-performing girls).

¹⁸ For detailed information and reports on PISA, see "Council of Ministers of Education, Canada - Programme for International Student Assessment" [https://www.cmec.ca/251/Programme_for_International_Student_Assessment_\(PISA\).html](https://www.cmec.ca/251/Programme_for_International_Student_Assessment_(PISA).html)

¹⁹ Source: OECD, PISA 2018 Database, Tables II.B1.8.19.

²⁰ Top performers refer to students who achieve at least Level 2 in all three core domains (reading, mathematics and science) and at least Level 5 in mathematics and/or science.

²¹ Source: OECD, PISA 2018 Database, Tables II.B1.8.22.

From 2010 to 2018, the growth of STEM graduates varied across levels of education and institution types

Between 2010 and 2018, the number of STEM and BHASE graduates increased across all levels of education except for students in postsecondary non-tertiary education (ISCED 4) where it decreased by 18 percent for STEM graduates and by 11 percent for BHASE graduates (Table 3.1).

When looking at STEM graduates overall, the number of students who obtained a short-cycle tertiary qualification in 2018 was more than double that in 2010. In contrast, these proportions were 43 percent, 65 percent, and 24 percent for students obtaining Bachelor's, Master's, or Doctoral degrees (Chart 3.1). A possible explanation for this significant growth could be that universities in Quebec expanded their STEM short-cycle programming: between 2010 and 2018, the number of STEM students who obtained a short-cycle tertiary qualification in Quebec universities increased sevenfold, rising from 963 to 6,534.

For the same time period, and across all levels of education, the number of BHASE graduates who received a short-cycle tertiary credential demonstrated the highest increase, at 60 percent. On the other hand, the number of students obtaining a Bachelor's degree in a BHASE field increased by 9 percent, although that number was more than two-and-a-half times higher for students who graduated from colleges.

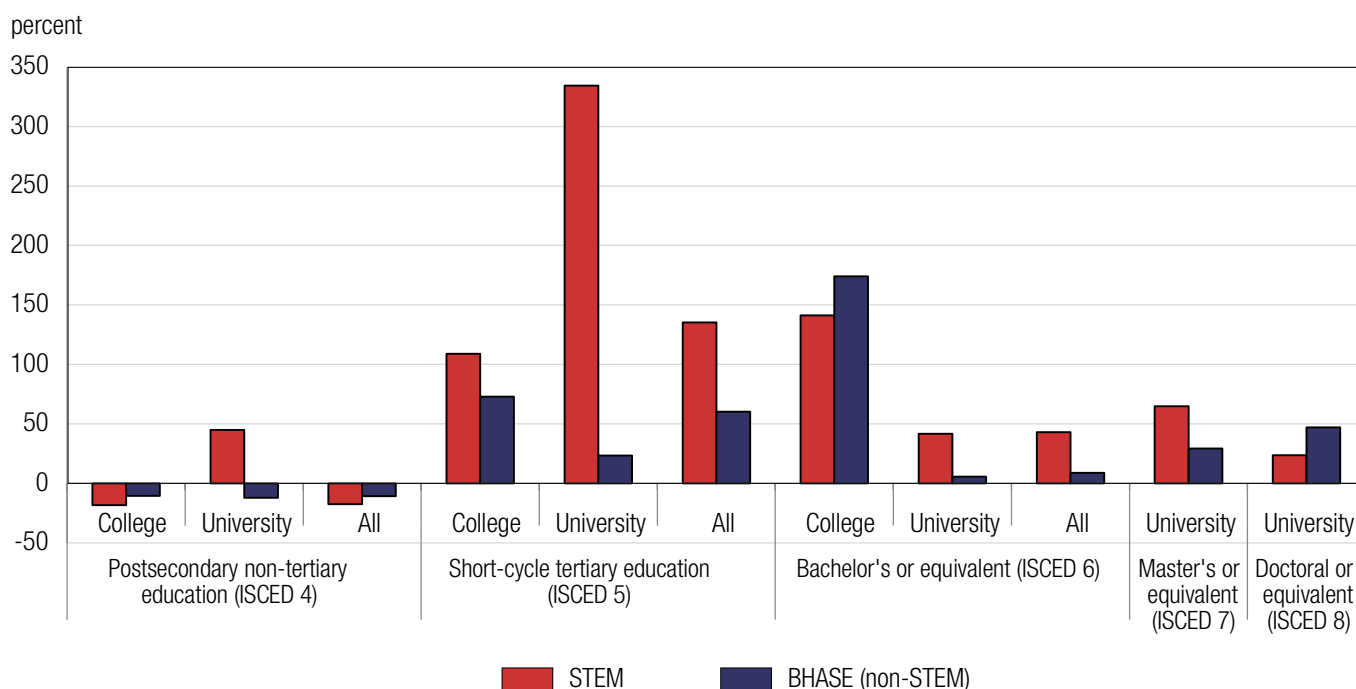
In Canada, the number of STEM students who graduated from universities increased at a faster rate than those who graduated from colleges (55 percent versus 43 percent). The opposite is true for BHASE graduates. The growth rate was 31 percent for students who obtained a BHASE postsecondary qualification from colleges, while it was 12 percent for university graduates.

The number of STEM postsecondary graduates from colleges or universities increased across all provinces between 2010 and 2018, except Nova Scotia where it slightly decreased by 2 percent for college graduates. This trend was different for BHASE graduates. The number of BHASE students who graduated from universities decreased by 17 percent in New Brunswick and was stagnant in Nova Scotia and in Newfoundland and Labrador. Focusing on BHASE students from colleges, the number of graduates decreased by 20 percent in Newfoundland and Labrador, and by 8 percent in Nova Scotia. In addition, the number of BHASE graduates was similar over this period in Prince Edward Island and in Quebec.

TABLE 3.1**Number of graduates^{22,23}, institution type, level of education, STEM and BHASE (non-STEM), Canada, 2010 and 2018**

Instructional Programs	Year	Postsecondary non-tertiary education (ISCED 4)		Short-cycle tertiary education (ISCED 5)		Bachelor's or equivalent (ISCED 6)		Master's or equivalent (ISCED 7)		Doctoral or equivalent (ISCED 8)
		College	University	College	University	College	University	College	University	University
STEM	2010	15,462	201	13,587	1,818	504	36,855		10,149	3,510
	2018	12,615	291	28,368	7,896	1,215	52,248	21	16,722	4,338
BHASE (non-STEM)	2010	81,666	5,319	70,119	23,655	2,766	137,883		37,920	2,436
	2018	73,011	4,671	121,143	29,190	7,578	145,419	27	48,987	3,582
Unclassified	2010	27		75	39		6		3	
	2018	192		543	2,364	3	153			

Source: Statistics Canada. Table 37-10-0164-01 Postsecondary graduates, by International Standard Classification of Education, institution type, Classification of Instructional Programs, STEM and BHASE groupings, status of student in Canada, age group and gender

CHART 3.1**Growth of total graduates, institution type, level of education, STEM and BHASE (non-STEM), Canada, 2010 to 2018**

Source: Postsecondary Student Information System (PSIS)

²² All counts are randomly rounded to a multiple of 3 using the following procedure: counts which are already a multiple of 3 are not adjusted; counts one greater than a multiple of 3 are adjusted to the next lowest multiple of 3 with a probability of two-thirds and to the next highest multiple of 3 with a probability of one-third. The probabilities are reversed for counts that are one less than a multiple of 3.

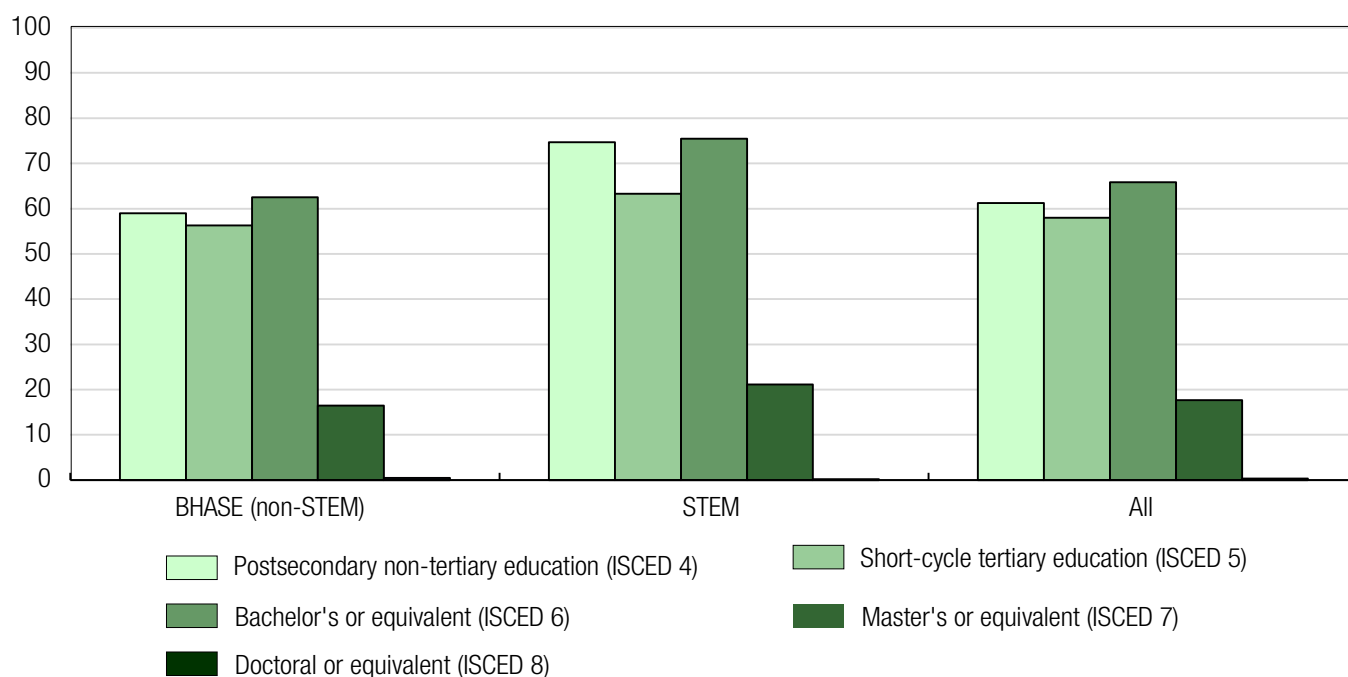
²³ Totals may not add up to the sum of all categories due to rounding.

STEM graduates tend to be younger than BHASE graduates

In 2018, STEM fields were more popular among graduates who were younger than 25 years old (Chart 4.1). In fact, this age group accounted for 62 percent of all STEM graduates across provinces, ranging from 54 percent in Newfoundland and Labrador to 76 percent in Prince Edward Island. About 3 out of 4 STEM graduates who obtained a postsecondary non-tertiary education qualification or a Bachelor's degree were younger than 25 years old, the highest percentages among all levels of education.

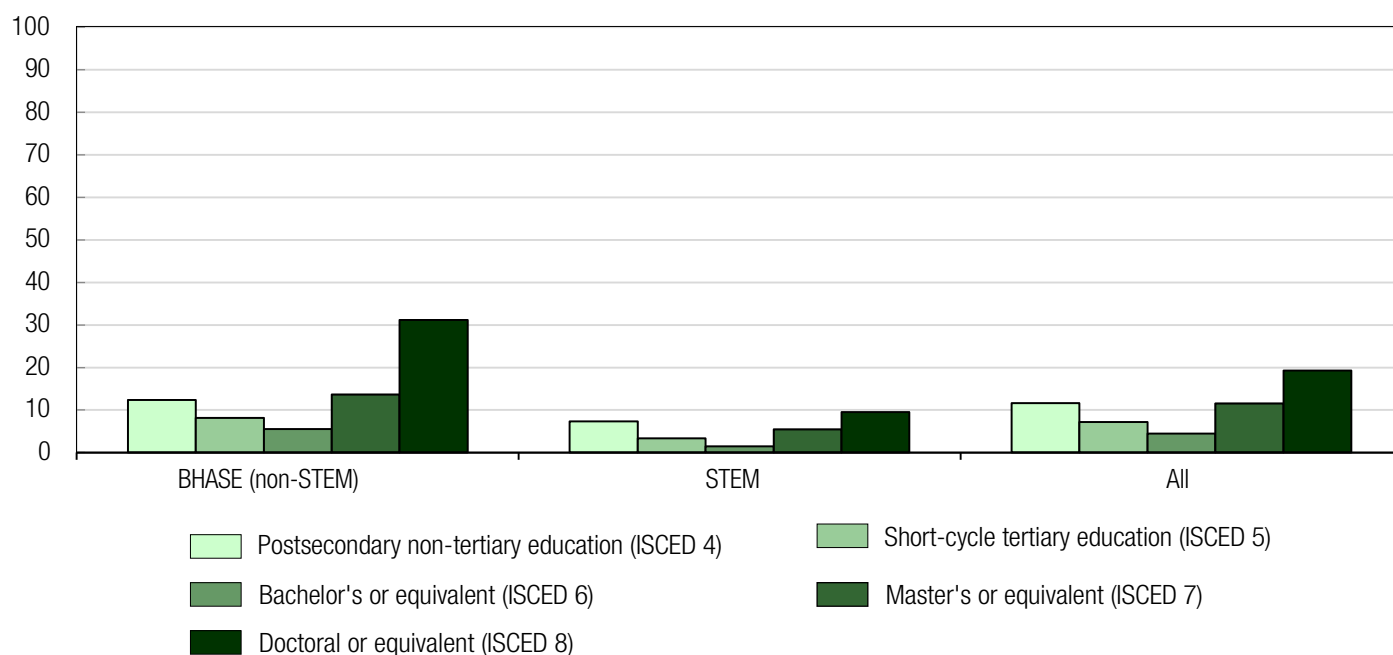
CHART 4.1

Distribution of graduates under 25 years of age (%), by field of study, by level of education, Canada, 2018



Source: Postsecondary Student Information System (PSIS)

In contrast, BHASE fields were more popular among Canadian graduates aged 40 or older, even though this older age group represented a small proportion of total graduates compared to younger age groups: 9 percent of BHASE graduates were 40 or older, whereas 3 percent of STEM graduates were within that same age group. This trend was similar across levels of education (Chart 4.2). The largest share of BHASE graduates aged 40 or older completed a qualification in “education and teaching”, where, across provinces, 19 percent of BHASE graduates aged 40 or older obtained a credential in this field, ranging from 12 percent in Ontario to 37 percent in Nova Scotia.

CHART 4.2**Distribution of graduates aged 40 or older (%), by field of study, by level of education, Canada, 2018**

Source: Postsecondary Student Information System (PSIS)

In the vast majority of provinces, the proportion of international students to total graduates is higher in STEM than in BHASE

In 2018, international students accounted for 18 percent of all postsecondary graduates. Overall, men were more likely to travel to Canada to pursue their postsecondary education; 55 percent of international student graduates were male in 2018. This figure is much higher than the share of Canadian male students (41 percent) and represents 10 percent of all postsecondary graduates. In the STEM fields, male graduates accounted for 68 percent among international students and 62 percent among Canadian students.

Although more students graduated within a BHASE field, the distribution of STEM and BHASE graduates varied between Canadian and international students: 30 percent of international students graduated in a STEM field (approximately 30,000 students), while 21 percent of Canadian students graduated in such a field (approximately 94,000 students).

Across provinces, the share of international students as a proportion of the total number of STEM graduates was 24 percent in 2018, ranging from 12 percent in Prince Edward Island to 32 percent in Ontario. In comparison, this proportion was 16 percent for BHASE graduates, ranging from 7 percent in Newfoundland and Labrador to 23 percent in Ontario (Chart 5.1). Across Canada, these shares of international graduates have more than doubled since 2010 for both STEM and BHASE.

On average, the number of international students who graduated in Canada increased by 16 percent per year between 2010 and 2018. However, this growth was faster for international students graduating from STEM fields, increasing on average by 19 percent per year, compared to 15 percent for international graduates in BHASE fields. Moreover, this increase in the number of international graduates varied across provinces. For instance, while the number of STEM international graduates in New Brunswick more than doubled during the reference period, the number of BHASE international graduates did not change.

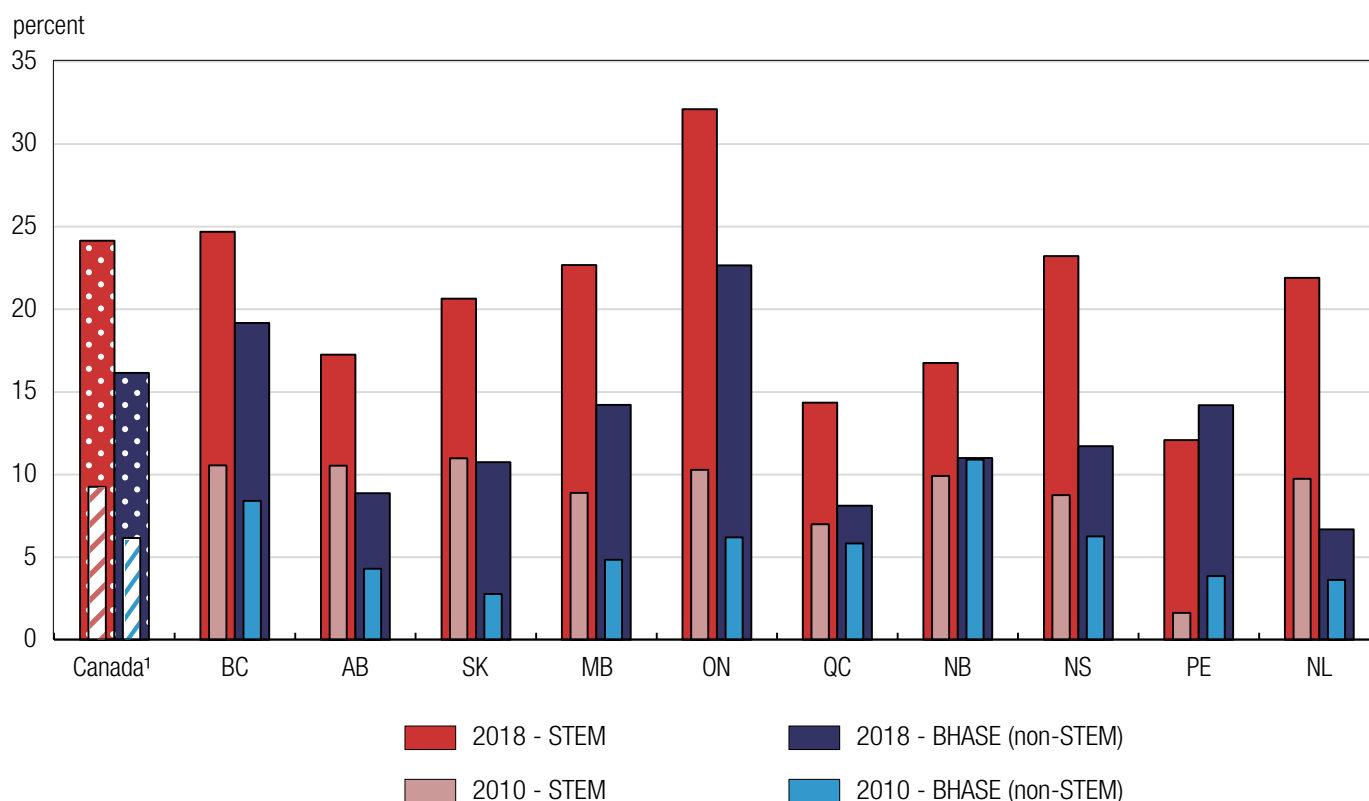
The number of Canadian graduates also increased from 2010 to 2018, at a significantly lower pace though: by 3 percent per year for STEM graduates, and by 1 percent per year for BHASE graduates.

The share of international graduates differs across levels of education. At the postsecondary non-tertiary level, the share of international graduates as a proportion of total graduates was 8 percent in 2018. This percentage reached 27 percent for international students who obtained short-cycle tertiary qualifications in Canada, and was noticeably higher for STEM graduates compared to BHASE graduates, at 33 percent and 25 percent, respectively. At the Bachelor's or equivalent level, 14 percent of STEM graduates were international students, compared to 11 percent for BHASE graduates.

The number of STEM international graduates was significantly higher at the Master's or equivalent, and Doctoral or equivalent levels; they accounted for at least 41 percent of all STEM students who obtained degrees at those levels in 2018. In contrast, the share of BHASE international graduates at the same levels of education was less than 20 percent.

CHART 5.1

International students as proportion of graduates, STEM and BHASE (non-STEM), Canada, provinces, 2010 and 2018



¹ Please note that while data from territories are not depicted, they are included in the calculation of the Canada number.

Note: The bars representing Canada are filled with a diagonal line and a dotted patterns to make them easier to find.

Source: Postsecondary Student Information System (PSIS).

The distribution of STEM and BHASE tertiary²⁴ graduates in Canada is similar to the OECD average

In 2018, the share of STEM tertiary graduates in Canada was 24 percent, which was 1 percentage point higher than the OECD average. Across G7 countries, Germany reported the highest share of STEM graduates at 35 percent, whereas the lowest share of STEM graduates was in the United States at 19 percent.

Similar to Canada, female STEM graduates are under-represented across OECD countries. On average, one woman for every two men graduated from a STEM field. The main exception was in Japan where the female-male ratio was near 1:5. The opposite trend was noticeable for BHASE graduates, as substantially more females graduated in a BHASE field than males (see Charts 6.1 and 6.2).

Approximately 1 out of 3 tertiary students graduated from a STEM field in Newfoundland and Labrador, the highest share across provinces. Female STEM graduates were the least represented in Quebec, where their share as a proportion of total tertiary graduates was nearly 7 percent, 2 percentage points lower than the average across Canada. In contrast, female STEM graduates in Newfoundland and Labrador represented 12 percent of total tertiary graduates.

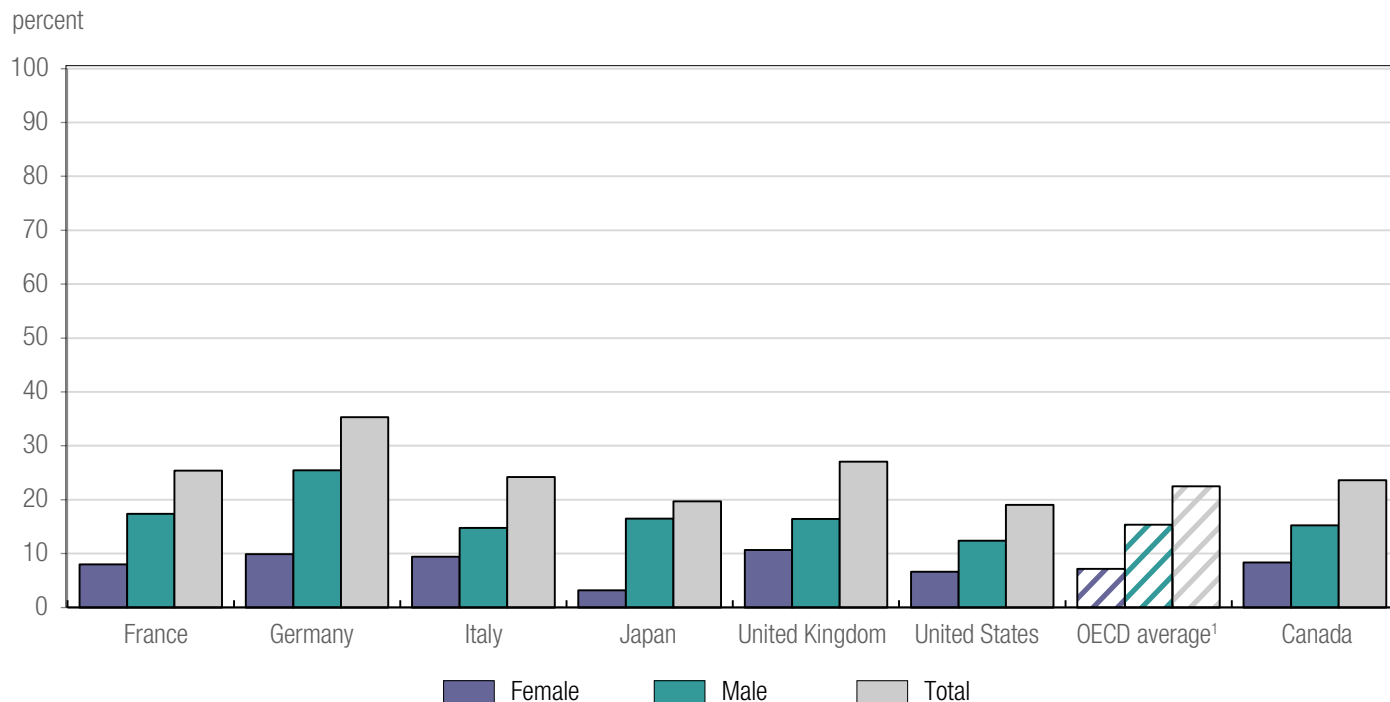
The share of female STEM graduates tends to increase at the Doctoral or equivalent level. On average across OECD countries, the share of female STEM graduates as a proportion of total graduates in Doctoral programs was 15 percent in 2018. This percentage was the highest in Canada, France and Italy at approximately 20 percent.

On the other hand, the share of female STEM graduates was the lowest at the short-cycle tertiary level. Female STEM graduates accounted for 4 percent of all students who obtained short-cycle tertiary qualifications on average across OECD countries. That percentage was 8 percent in Germany, and 5 percent in Canada.

At the Bachelor's or equivalent level, and at the Master's or equivalent level, the shares of female STEM graduates in Canada were higher than the OECD averages (Chart 6.3).

²⁴ Tertiary education includes what is commonly understood as academic education but also includes advanced vocational or professional education. It comprises ISCED levels 5, 6, 7 and 8, which are labelled as short-cycle tertiary education, Bachelor's or equivalent level, Master's or equivalent level, and Doctoral or equivalent level, respectively. See *ISCED 2011 Operational Manual*: <https://www.oecd-ilibrary.org/docserver/9789264228368-en.pdf?expires=1588271129&id=id&accname=guest&checksum=9B9C4D94F0CFCBABBDD7C8265B5810B1>

CHART 6.1
Distribution of STEM tertiary graduates (%), gender, OECD, G7 countries, 2018

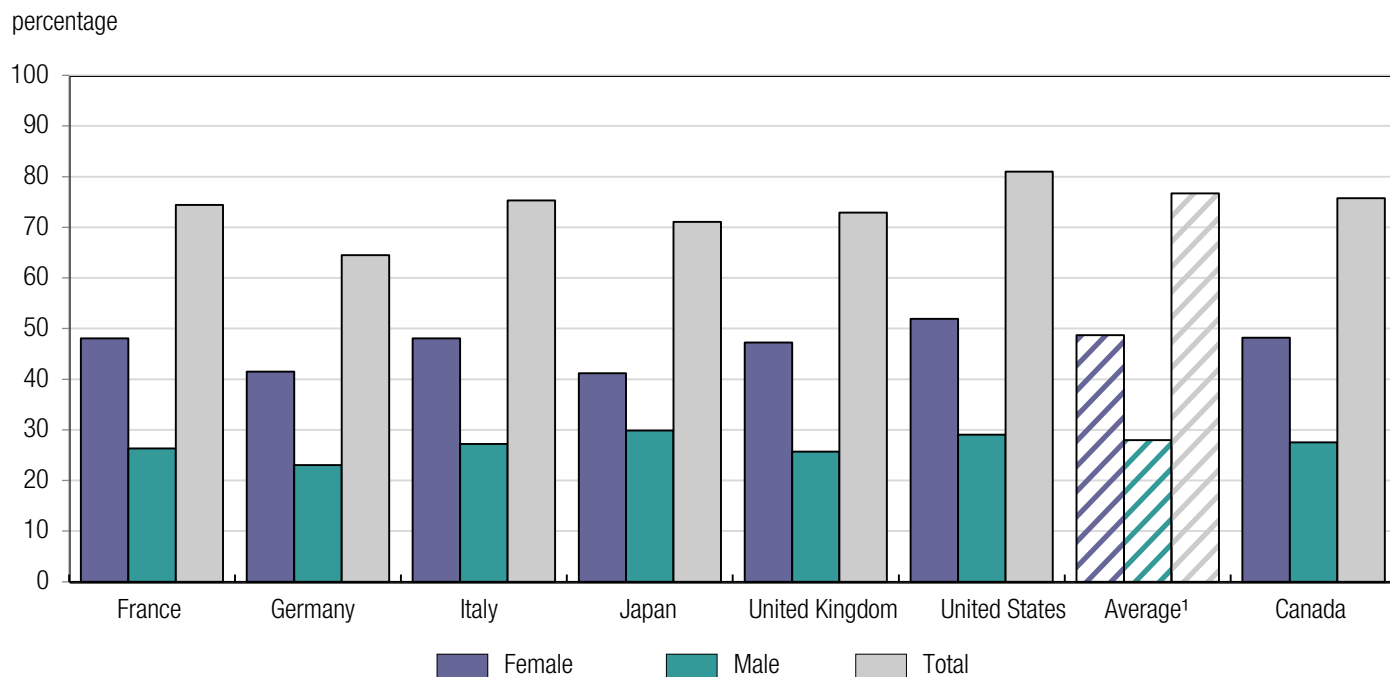


¹ The OECD average includes data from the list of OECD member countries as of April 2020.

Note: The bars representing the OECD are filled with a diagonal line pattern to make them easier to find.

Sources: Postsecondary Student Information System (PSIS) for Canada; *Education at a Glance (2020)*; *OECD indicators* for OECD countries.

CHART 6.2
Distribution of BHASE (non-STEM) tertiary graduates (%), gender, OECD, G7 countries, 2018



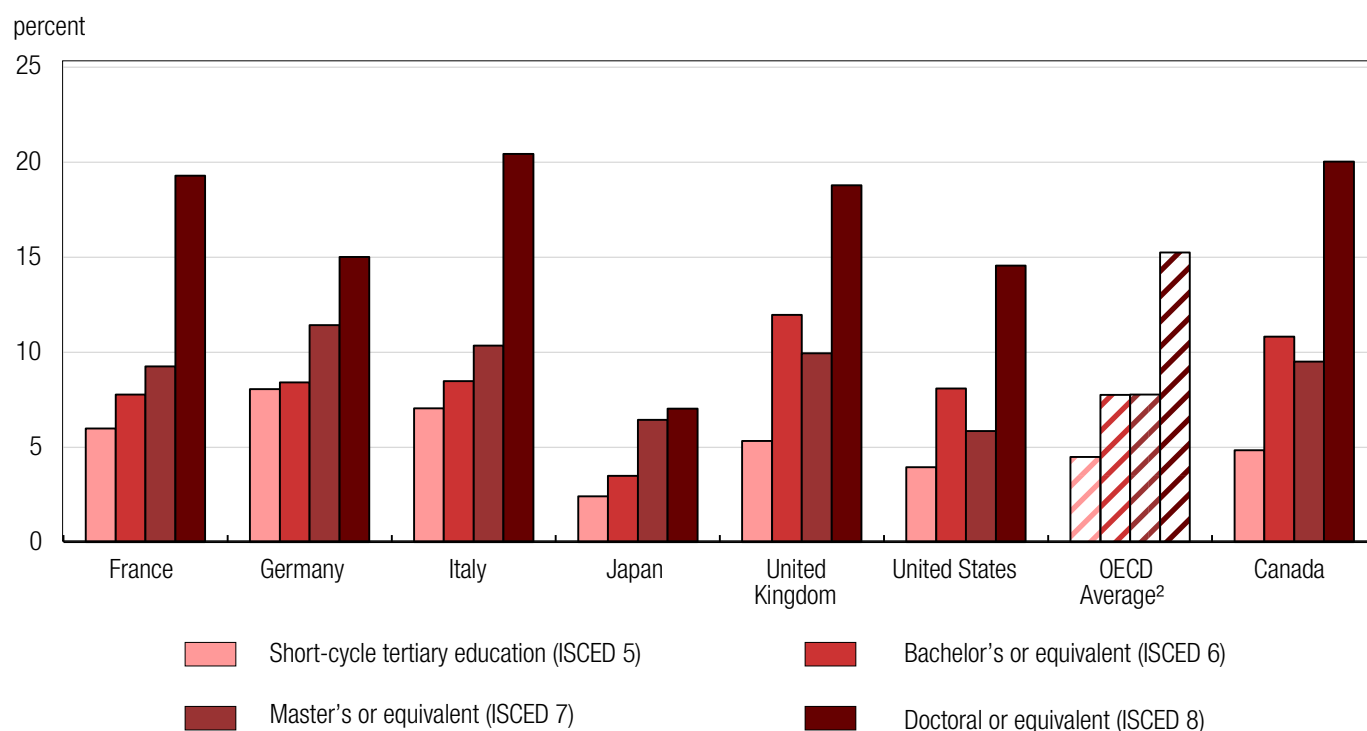
¹ The OECD average includes data from the list of OECD member countries as of April 2020.

Note: The bars representing the OECD are filled with a diagonal line pattern to make them easier to find.

Sources: Postsecondary Student Information System (PSIS) for Canada; *Education at a Glance (2020)*; *OECD indicators* for OECD countries.

CHART 6.3

Female STEM graduates as a share of total tertiary graduates¹, by level of education, OECD, G7 countries, 2018



¹ Please note that data where the field of study is unclassified are not included.

² The OECD average includes data from the list of OECD member countries as of April 2020.

Note: The bars representing the OECD are filled with a diagonal pattern to make them easier to find.

Sources: Postsecondary Student Information System (PSIS) for Canada; *Education at a Glance (2020)*; *OECD indicators* for OECD countries.

When combined, international students who obtained a tertiary qualification in Canada, in the United Kingdom, and in the United States represented more than half of all international graduates across OECD countries in 2018²⁵. Overall, the share of international graduates as a proportion of tertiary graduates was 25 percent in the United Kingdom, the highest among G7 countries, 18 percentage points higher than the OECD average, and 5 percentage points higher than in Canada. Across provinces, British Columbia and Ontario reported the highest share of tertiary international graduates at 25 percent (Chart 6.4).

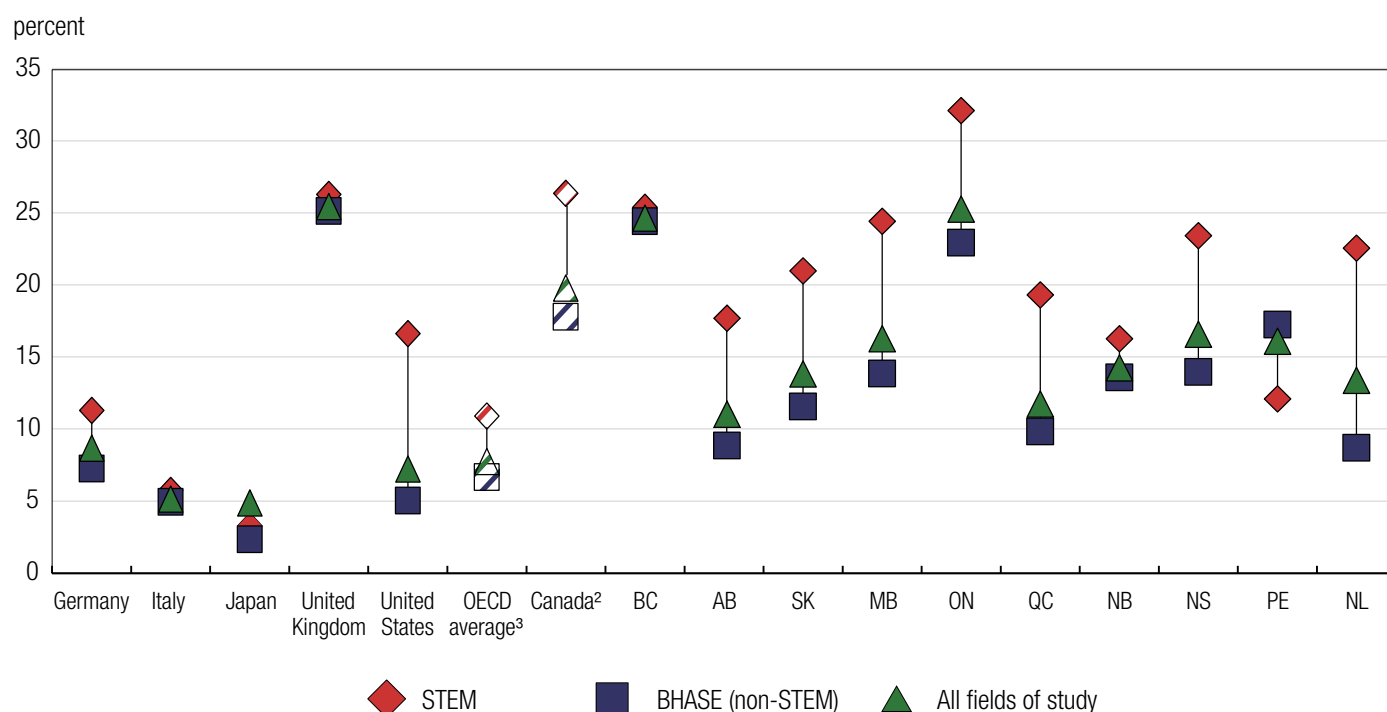
Across OECD countries and in Canada, the share of international student STEM graduates as a proportion of total STEM graduates was higher than the share of international student BHASE graduates as a proportion of total BHASE graduates. In the United Kingdom and in Canada, about 1 out of every 4 students who obtained a tertiary qualification in a STEM field was an international student. Across provinces, this percentage was the highest in Ontario at 32 percent.

It is important to note that the difference in the share of international student graduates differs significantly between STEM and BHASE fields, and this trend can be observed in numerous countries. For instance, in the United States, the share of international student graduates was 12 percentage points higher in STEM than in BHASE. In Canada, this difference was 9 percentage points in favour of STEM graduates, whereas it was 4 percentage points on average across OECD countries. However, there were exceptions to this trend: in the United Kingdom, Italy, Japan and British Columbia, the share of international students who graduated in a STEM or in a BHASE field was almost the same.

²⁵ See *Education at a Glance 2020: OECD indicators*.

CHART 6.4

International students as a proportion of tertiary graduates, field of study, OECD, G7 countries¹, provinces, 2018



¹ Please note that data are not available for France.

² Please note that while data from territories are not depicted, they are included in the calculation of the Canada number.

³ The OECD average includes data from the list of OECD member countries as of April 2020.

Note: The markers representing Canada and the OECD are filled with a diagonal line pattern to make them easier to find.

Sources: Postsecondary Student Information System (PSIS) for provinces, territories and Canada; *Education at a Glance (2020): OECD indicators* for OECD countries.

Conclusion

This fact sheet reviews trends among postsecondary graduates in both STEM and BHASE fields. Between 2010 and 2018, the number of students who received a credential from a Canadian public postsecondary institution increased by 26 percent. However, the number of STEM graduates rose faster than the number of BHASE graduates; as a result, the share of STEM graduates as a proportion of total graduates reached a peak in 2018 at 22 percent. This pattern was consistent across provinces and territories.

Changes in the number of graduates followed different trends depending on the subfield of study. Across Canada, the number of graduates in the STEM fields “mathematics and computer and information sciences” and “engineering and engineering technology” increased by 89 percent and 71 percent respectively, whereas the BHASE field of “education and teaching” decreased by 12 percent.

Between 2010 and 2018, the number of female STEM graduates increased by 47 percent across Canada. Despite this encouraging trend, the gender gap between male and female STEM graduates was higher in 2018 than in 2010 due to the number of male STEM graduates growing at a faster rate. PISA 2018 data also show that more 15-year-old male students expect to pursue a career in a science-related position than

female students²⁶, contributing to the gender gap in STEM and BHASE enrolments, and consequently to the gender gap among graduates.

Moreover, female STEM graduates are under-represented across OECD countries. In 2018, the share of female students who obtained tertiary credentials in STEM fields as a proportion of total tertiary graduates was 7 percent on average across OECD countries, one percentage point less than in Canada. At the Doctoral or equivalent level, the share of female STEM graduates as a proportion of total graduates was 20 percent, the highest share across all levels of education. This pattern was similar across OECD countries.

The number of students who obtained a postsecondary non-tertiary qualification in Canada between 2010 and 2018 decreased for both STEM and BHASE fields of study, by 18 and 11 percent, respectively. However, the number of STEM and BHASE graduates increased across all other levels of education.

STEM fields were more popular among younger adults (less than 25 years old) and BHASE fields were more popular among older adults (40 years old or older). These trends were similar across all levels of education.

Canada is an attractive destination for international students, specifically for obtaining a credential in STEM fields. In 2018, 24 percent of STEM postsecondary graduates were international students, whereas this proportion was 16 percent for BHASE fields. Focusing on tertiary graduates, the share of international students who graduated in Canada was higher than the OECD average, for both STEM and BHASE fields. Lastly, Master's or equivalent, and Doctoral or equivalent levels accounted for the largest share of international STEM graduates.

The information collected above on Canada's postsecondary graduates provides insight into the makeup of student populations as well as workforces across Canada. Trends on student participation in STEM and BHASE programs can help inform postsecondary education (PSE) policy and planning. For example, efforts to ensure PSE is more accessible and more closely aligned to the labour market can be informed by these findings. These data may also be useful to support preparing for PSE's role in the forthcoming economic recovery from COVID-19, while at the same time there may be an opportunity in the future to explore how COVID-19 has had an impact on these trends.

Further research is required to fully understand growth in the STEM fields. One potential avenue of additional analysis could be investigating the multiple factors related to the increase of students pursuing STEM degrees, such as the weight of individual interests and ambitions, labour market demands, or the availability of new or redefined degree options offered by postsecondary institutions. Understanding the intricacies that have generated growth in STEM fields also requires additional research on the interests of and opportunities provided to women and international students in Canada.

Data sources

The Postsecondary Student Information System²⁷ (PSIS) provides the latest available administrative data on Canadian postsecondary institution graduates from public colleges and universities.

Graduate counts for certain institutions are preliminary or are based on estimates. Graduate data are published based on the calendar year.

Education at a Glance is a yearly publication that provides data on and comparative analysis of educational systems across OECD countries and a number of partner economies²⁸.

²⁶ Source: OECD, PISA 2018 Database, Tables II.B1.8.19.

²⁷ See Postsecondary Student Information System: <https://www.statcan.gc.ca/eng/survey/business/5017>

²⁸ See *Education at a Glance 2020*: <https://www.oecd.org/education/education-at-a-glance/>

TABLE A.1
Number of graduates^{1, 2}, STEM and BHASE (non-STEM) subfields, gender, Canada, 2010, 2018

	Female		Male		Unknown	
	2010	2018	2010	2018	2010	2018
Total	258,930	317,913	184,164	241,773	891	900
STEM	30,405	44,769	51,585	78,792	90	162
Science and science technology	21,585	27,333	17,133	19,767	6	81
Engineering and engineering technology	5,148	9,828	24,777	41,400	42	54
Mathematics and computer and information sciences	3,672	7,602	9,672	17,610	36	27
BHASE	228,426	271,824	132,528	161,058	798	732
Business and administration	49,686	63,429	41,472	59,706	183	153
Arts and humanities	40,944	41,043	22,614	23,379	123	102
Social and behavioural sciences	40,275	48,627	16,209	17,901	57	126
Legal professions and studies	5,073	6,711	2,589	3,366	24	9
Health care	43,185	57,483	8,931	12,330	186	108
Education and teaching	24,777	22,209	7,746	6,357	21	48
Trades, services, natural resources and conservation	24,498	32,319	32,973	38,016	201	192
Unclassified	99	1,320	51	1,923	3	6

¹ All counts are randomly rounded to a multiple of 3 using the following procedure: counts which are already a multiple of 3 are not adjusted; counts one greater than a multiple of 3 are adjusted to the next lowest multiple of 3 with a probability of two-thirds and to the next highest multiple of 3 with a probability of one-third. The probabilities are reversed for counts that are one less than a multiple of 3.

² Totals may not add up to the sum of all categories due to rounding.

Source: Statistics Canada. Table 37-10-0164-01 Postsecondary graduates, by International Standard Classification of Education, institution type, Classification of Instructional Programs, STEM and BHASE groupings, status of student in Canada, age group and gender

ANNEX 2

TABLE A.2

Number of graduates^{1,2}, STEM and BHASE (non-STEM) subfields, Canada, provinces and territories, 2010, 2018

		Number of graduates		
		2010	2018	percentage change
Canada	Total	443,991	560,565	26
	STEM	82,083	123,711	51
	Science and science technology	38,727	47,184	22
	Engineering and engineering technology	29,970	51,279	71
	Mathematics and computer and information sciences	13,383	25,245	89
	BHASE	361,758	433,605	20
	Business and administration	91,341	123,285	35
	Arts and humanities	63,675	64,527	1
	Social and behavioural sciences	56,544	66,660	18
	Legal professions and studies	7,692	10,089	31
	Health care	52,296	69,918	34
	Education and teaching	32,547	28,608	-12
	Trades, services, natural resources and conservation	57,663	70,530	22
	Unclassified	150	3,249	2066
British Columbia	Total	56,541	68,331	21
	STEM	8,193	12,342	51
	Science and science technology	3,594	4,989	39
	Engineering and engineering technology	2,715	4,098	51
	Mathematics and computer and information sciences	1,872	3,252	74
	BHASE	48,348	55,989	16
	Business and administration	10,737	13,971	30
	Arts and humanities	6,447	6,825	6
	Social and behavioural sciences	7,203	8,535	18
	Legal professions and studies	744	1,107	49
	Health care	7,311	8,304	14
	Education and teaching	4,818	4,773	-1
	Trades, services, natural resources and conservation	11,085	12,465	12

TABLE A.2 (cont'd)

Number of graduates^{1,2}, STEM and BHASE (non-STEM) subfields, Canada, provinces and territories, 2010, 2018

		Number of graduates		
		2010	2018	percentage change
Alberta	Total	36,504	44,271	21
	STEM	7,209	9,603	33
	Science and science technology	2,802	3,627	29
	Engineering and engineering technology	3,435	4,488	31
	Mathematics and computer and information sciences	975	1,491	53
	BHASE	29,295	34,668	18
	Business and administration	7,239	8,712	20
	Arts and humanities	3,204	2,466	-23
	Social and behavioural sciences	3,894	4,731	21
	Legal professions and studies	486	669	38
	Health care	7,032	8,727	24
	Education and teaching	2,688	3,198	19
	Trades, services, natural resources and conservation	4,746	6,174	30
Saskatchewan	Total	9,132	10,926	20
	STEM	1,770	2,118	20
	Science and science technology	933	1,119	20
	Engineering and engineering technology	681	870	28
	Mathematics and computer and information sciences	165	135	-18
	BHASE	7,362	8,808	20
	Business and administration	1,374	1,833	33
	Arts and humanities	801	1,029	28
	Social and behavioural sciences	705	609	-14
	Legal professions and studies	102	165	62
	Health care	1,626	2,103	29
	Education and teaching	1,062	1,107	4
	Trades, services, natural resources and conservation	1,695	1,971	16

TABLE A.2 (cont'd)

Number of graduates^{1,2}, STEM and BHASE (non-STEM) subfields, Canada, provinces and territories, 2010, 2018

		Number of graduates		
		2010	2018	percentage change
Manitoba	Total	10,071	12,855	28
	STEM	2,091	2,808	34
	Science and science technology	972	1,296	33
	Engineering and engineering technology	804	825	3
	Mathematics and computer and information sciences	318	690	117
	BHASE	7,980	10,047	26
	Business and administration	1,383	1,869	35
	Arts and humanities	1,092	1,098	1
	Social and behavioural sciences	1,521	1,812	19
	Legal professions and studies	90	123	37
	Health care	1,329	1,782	34
	Education and teaching	1,083	1,383	28
	Trades, services, natural resources and conservation	1,482	1,974	33
Ontario	Total	176,085	241,122	37
	STEM	33,357	54,891	65
	Science and science technology	14,214	18,543	30
	Engineering and engineering technology	13,059	23,319	79
	Mathematics and computer and information sciences	6,081	13,032	114
	BHASE	142,626	185,568	30
	Business and administration	33,021	57,960	76
	Arts and humanities	21,531	21,198	-2
	Social and behavioural sciences	28,074	32,586	16
	Legal professions and studies	3,651	4,548	25
	Health care	20,031	30,042	50
	Education and teaching	12,456	7,494	-40
	Trades, services, natural resources and conservation	23,862	31,737	33
	Unclassified	102	663	550

TABLE A.2 (cont'd)

Number of graduates^{1,2}, STEM and BHASE (non-STEM) subfields, Canada, provinces and territories, 2010, 2018

		Number of graduates		
		2010	2018	percentage change
Quebec	Total	126,303	151,608	20
	STEM	24,084	34,626	44
	Science and science technology	13,893	14,829	7
	Engineering and engineering technology	6,912	14,424	109
	Mathematics and computer and information sciences	3,285	5,382	64
	BHASE	102,171	114,465	12
	Business and administration	32,631	33,360	2
	Arts and humanities	28,107	30,033	7
	Social and behavioural sciences	12,114	15,093	25
	Legal professions and studies	2,289	3,126	37
	Health care	10,722	14,496	35
	Education and teaching	7,281	8,214	13
	Trades, services, natural resources and conservation	9,018	10,140	12
	Unclassified	48	2,517	5144
New Brunswick	Total	7,032	7,992	14
	STEM	1,146	1,593	39
	Science and science technology	423	501	18
	Engineering and engineering technology	531	672	27
	Mathematics and computer and information sciences	195	429	120
	BHASE	5,886	6,399	9
	Business and administration	1,269	1,395	10
	Arts and humanities	576	549	-5
	Social and behavioural sciences	831	885	6
	Legal professions and studies	123	129	5
	Health care	1,104	1,104	0
	Education and teaching	906	693	-24
	Trades, services, natural resources and conservation	1,092	1,653	51

TABLE A.2 (cont'd)

Number of graduates^{1,2}, STEM and BHASE (non-STEM) subfields, Canada, provinces and territories, 2010, 2018

		Number of graduates		
		2010	2018	percentage change
Nova Scotia	Total	14,196	14,754	4
	STEM	2,706	3,588	33
	Science and science technology	1,314	1,512	15
	Engineering and engineering technology	1,059	1,491	41
	Mathematics and computer and information sciences	336	594	77
	BHASE	11,490	11,166	-3
	Business and administration	2,445	2,802	15
	Arts and humanities	1,329	834	-37
	Social and behavioural sciences	1,551	1,614	4
	Legal professions and studies	198	198	0
	Health care	2,085	2,202	6
	Education and teaching	1,344	930	-31
	Trades, services, natural resources and conservation	2,544	2,595	2
Prince Edward Island	Total	1,746	2,127	22
	STEM	186	372	100
	Science and science technology	96	231	141
	Engineering and engineering technology	39	69	77
	Mathematics and computer and information sciences	45	78	73
	BHASE	1,560	1,755	13
	Business and administration	252	375	49
	Arts and humanities	108	75	-31
	Social and behavioural sciences	192	201	5
	Legal professions and studies		18	
	Health care	294	330	12
	Education and teaching	138	231	67
	Trades, services, natural resources and conservation	576	516	-10

TABLE A.2 (cont'd)

Number of graduates^{1,2}, STEM and BHASE (non-STEM) subfields, Canada, provinces and territories, 2010, 2018

		Number of graduates		
		2010	2018	percentage change
Newfoundland and Labrador	Total	6,123	6,057	-1
	STEM	1,320	1,677	27
	Science and science technology	495	537	8
	Engineering and engineering technology	726	960	32
	Mathematics and computer and information sciences	102	177	74
	BHASE	4,803	4,308	-10
	Business and administration	855	834	-2
	Arts and humanities	468	387	-17
	Social and behavioural sciences	435	537	23
	Legal professions and studies	9	6	-33
	Health care	729	768	5
	Education and teaching	759	570	-25
	Trades, services, natural resources and conservation	1,545	1,209	-22
	Unclassified		72	
Territories	Total	264	516	95
	STEM	27	90	233
	Science and science technology		9	
	Engineering and engineering technology	24	75	213
	Mathematics and computer and information sciences	6	3	-50
	BHASE	237	426	80
	Business and administration	138	189	37
	Arts and humanities	3	30	900
	Social and behavioural sciences	30	54	80
	Health care	30	48	60
	Education and teaching	9	15	67
	Trades, services, natural resources and conservation	27	96	256

¹ All counts are randomly rounded to a multiple of 3 using the following procedure: counts which are already a multiple of 3 are not adjusted; counts one greater than a multiple of 3 are adjusted to the next lowest multiple of 3 with a probability of two-thirds and to the next highest multiple of 3 with a probability of one-third. The probabilities are reversed for counts that are one less than a multiple of 3.

² Totals may not add up to the sum of all categories due to rounding.

Source: Statistics Canada. Table 37-10-0164-01 Postsecondary graduates, by International Standard Classification of Education, institution type, Classification of Instructional Programs, STEM and BHASE groupings, status of student in Canada, age group and gender

ANNEX 3

TABLE A.3
Distribution of international graduates, level of education, STEM and BHASE (non-STEM), Canada, provinces, 2018

	Postsecondary non-tertiary education (ISCED 4)		Short-cycle tertiary education (ISCED 5)		Bachelor's or equivalent (ISCED 6)		Master's or equivalent (ISCED 7)		Doctoral or equivalent (ISCED 8)	
	STEM	BHASE	STEM	BHASE	STEM	BHASE	STEM	BHASE	STEM	BHASE
	percent									
Canada	5	9	33	25	14	11	47	17	41	20
British Columbia	17	7	26	28	18	22	50	24	46	26
Alberta	7	9	11	13	11	5	43	9	52	29
Saskatchewan	13	9	16	18	10	8	60	10	50	37
Manitoba	14	16	16	22	20	12	53	10	51	23
Ontario	32	20	53	37	13	8	44	15	30	12
Quebec	3	2	8	6	13	10	48	19	49	22
New Brunswick	23	5	19	7	11	15	37	23	40	14
Nova Scotia	0	0	13	3	17	18	68	16	35	13
Prince Edward Island	0	5	13	14	10	18	17	24	33	50
Newfoundland and Labrador	0	1	2	3	13	10	60	14	65	10

Source: Statistics Canada. Table 37-10-0164-01 Postsecondary graduates, by International Standard Classification of Education, institution type, Classification of Instructional Programs, STEM and BHASE groupings, status of student in Canada, age group and gender

