Trends in the Engineering Profession

Observation and Analysis from the 2021 Canada Census

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ONTARIO
SOCIETY OF
PROFESSIONAL
ENGINEERS

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Introduction

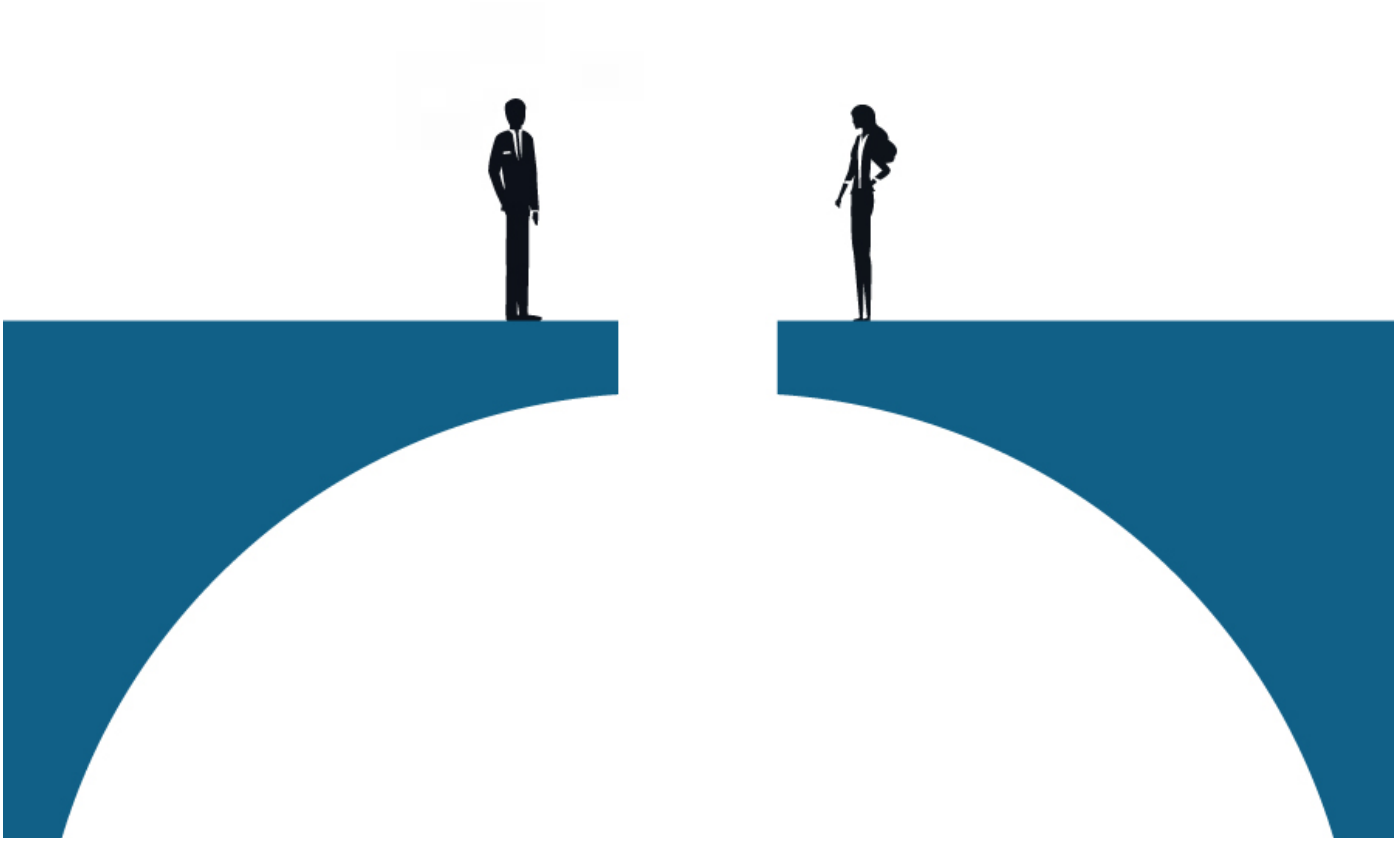
Every five years, Statistics Canada conducts their country wide census and every five years, OSPE analyzes this census data and creates a snapshot of labour market conditions for Ontarians with engineering degrees. Welcome to the report of OSPE's findings from the most recent (2021) Canada Census!

OSPE's objectives in analyzing census data are (1) to determine how many Ontarians with degrees in engineering are working in their field, in other professional positions, or are underemployed, (2) to determine if there are differences between income between men and women with engineering degrees and (3) compare labour market conditions between those with degrees from inside Canada and those with degrees attained from outside Canada. Comparisons are also made between those with engineering degrees and those with degrees from other disciplines.

Overall, graduates with degrees from inside Canada are faring well in terms of employment and income, especially men. By the same token, many of those with degrees from outside Canada, especially women, are faced with being employed in low paying jobs that are not commensurate with their degree. Understanding what the data is telling us is the first step. Meaningful change comes next.

Please review the series of published articles about the state of our engineering community in Ontario.

To find this report and others please visit the Research Reports page on our website.



Engineering Employment in Ontario: 2021 Census Confirms the Need for Change

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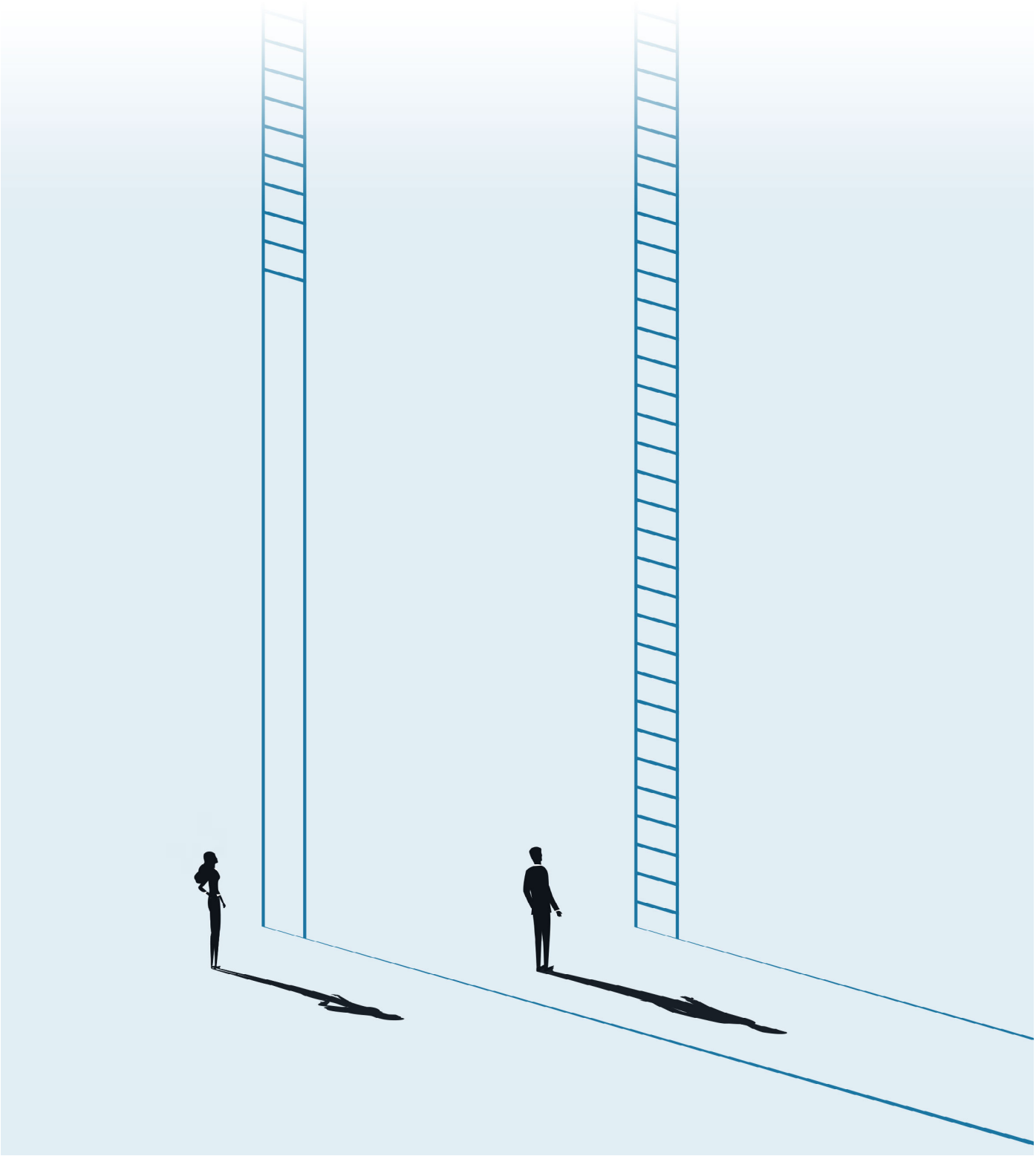


Every five years, Canada produces a Census and OSPE reviews this data to see how our engineering community is changing. The great thing about the Census is that it provides reams of quantitative data, and because of its history, we are able to see meaningful trends develop over time.

The downside is that there is no qualitative report; so as we review changes to the engineering community and workforce, we must use insights from other sources (including the personal experiences of engineering graduates) to tell the story of what this data means.

Our review of the 2021 Census attempts to tell the story both of the numbers and the many factors behind them. This is just the first in a series of articles stemming from this review.

WHAT ARE WE LOOKING FOR?

OSPE has four objectives in analyzing 2021 Census data:

1. Determine how many Ontarians with engineering degrees work in each of five employment categories:
    - Working in Engineering
    - Working in Other STEM Fields
    - Other Professionals
    - Non-Engineering Professionals
    - Underemployed
2. Compare the proportions of men and women working in these categories;
3. Determine if these ratios have changed meaningfully over time, and;
4. Examine differences in employment type between International Engineering Graduates (IEGs) and Ontarians with Canadian engineering degrees.

See definitions below.

Our analysis is limited to individuals aged 25-64 years who were employed at the time of the 2021 Census. Also, note that Census data does not distinguish between licensed engineers and non-licensed engineering graduates; therefore, all findings are based solely on individuals having a bachelor's degree (or higher) in engineering.

Working in Engineering: Those working as an engineer or engineering manager (excluding software engineers).

Working in Other STEM Fields: Those working in other STEM professions (including software engineering).

Other Professionals: Those working in non-STEM jobs normally requiring a university degree.

Non-Engineering Professionals: Those working in non-engineering STEM professions or other professions normally requiring a university degree. (This is a combination of categories 2 and 3.)

Underemployed: Those working in jobs that do not necessarily require a university degree, including engineering technologists.

It must be noted that the "underemployed" classification does not reflect whether the occupation is lower-paying, lower-status, or not a bona-fide profession. For example: engineering technologist positions do not normally require a university degree. A college diploma qualifies one to work in the profession, and thus, a graduate with an engineering degree working as an engineering technologist is deemed underemployed. Engineering technologists are certainly viewed as professionals by OSPE. On the other hand, underemployment also includes retail salespeople, construction workers, and taxi drivers, amongst many others.

EMPLOYMENT TRENDS FOR ENGINEERING GRADUATES

Table 1.1: Employment Categories - Ontario Residents with Engineering Degrees (2021)

ONTARIO ENGINEERING DEGREE HOLDERS	NUMBER	PROPORTION TO TOTAL
Total	259,615	100%
Men	205,580	79%
Women	54,015	21%
Working in Engineering	75,115	29%
Men	63,020	31%
Women	12,090	22%
Other STEM Fields	55,595	21%
Men	43,270	21%
Women	12,330	23%
Total Engineering/STEM	130,710	50%
Men	106,290	52%
Women	24,420	45%
Other Professionals	32,075	12%
Men	23,125	52%
Women	8,950	17%
Non-Engineering Professionals	87,670	34%
Men	66,395	32%
Women	21,280	39%
Underemployed	96,830	37%
Men	76,165	32%
Women	20,645	38%

Data Source: 2021 Canada Census

Key Observations

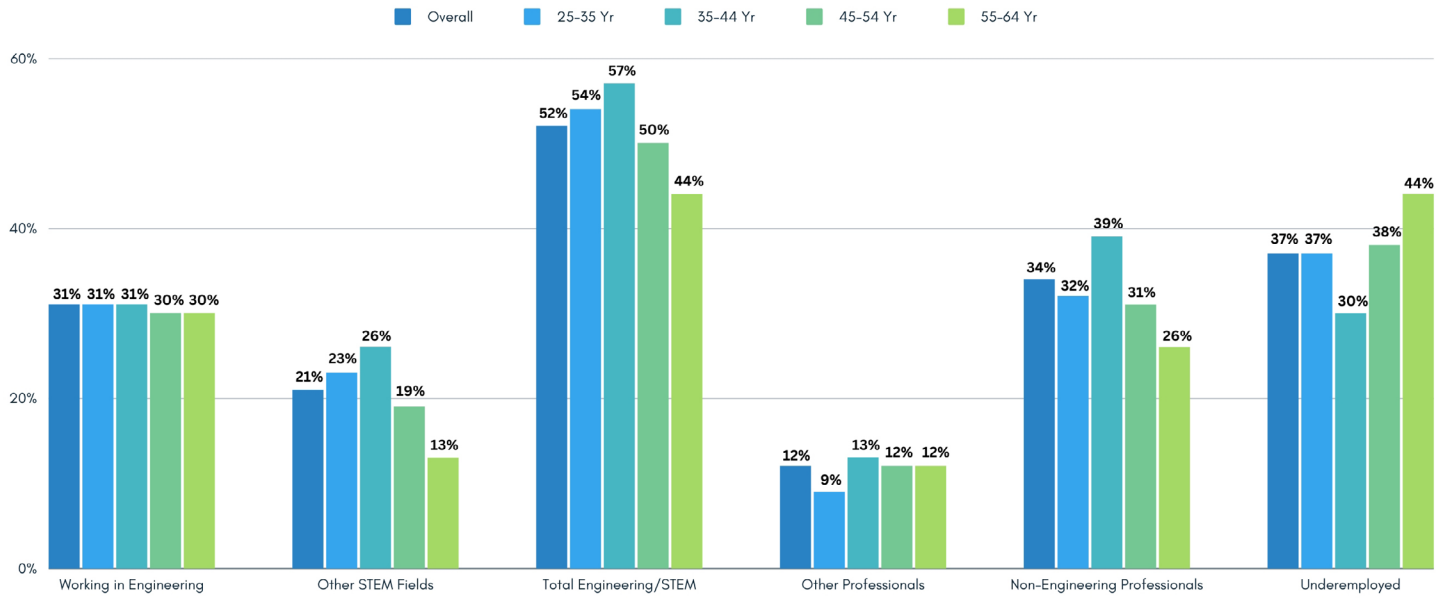
Of the 259,615 Ontario residents with engineering degrees...

- **Less than one-third are working in engineering.**
  - » This is fascinating, since industry partners often tell OSPE there is a high demand for engineers.
- **Nearly 50 per cent are working in STEM fields (including engineering).**
- **Degree holders are more likely to work in non-engineering professional jobs than in engineering.**

These findings invite us to explore what systemic changes might increase the proportion of engineering graduates working in engineering.

COMPARING MALE AND FEMALE ENGINEERING GRADUATES

Figure 1.1: Proportion of Men Working in Different Employment Categories (2021)



Data Source: 2021 Canada Census

Key Observations

- The proportion of men who work in engineering is stable across all age ranges.
- Over 50 per cent of men aged 25-44 with engineering degrees work in STEM fields (including engineering).

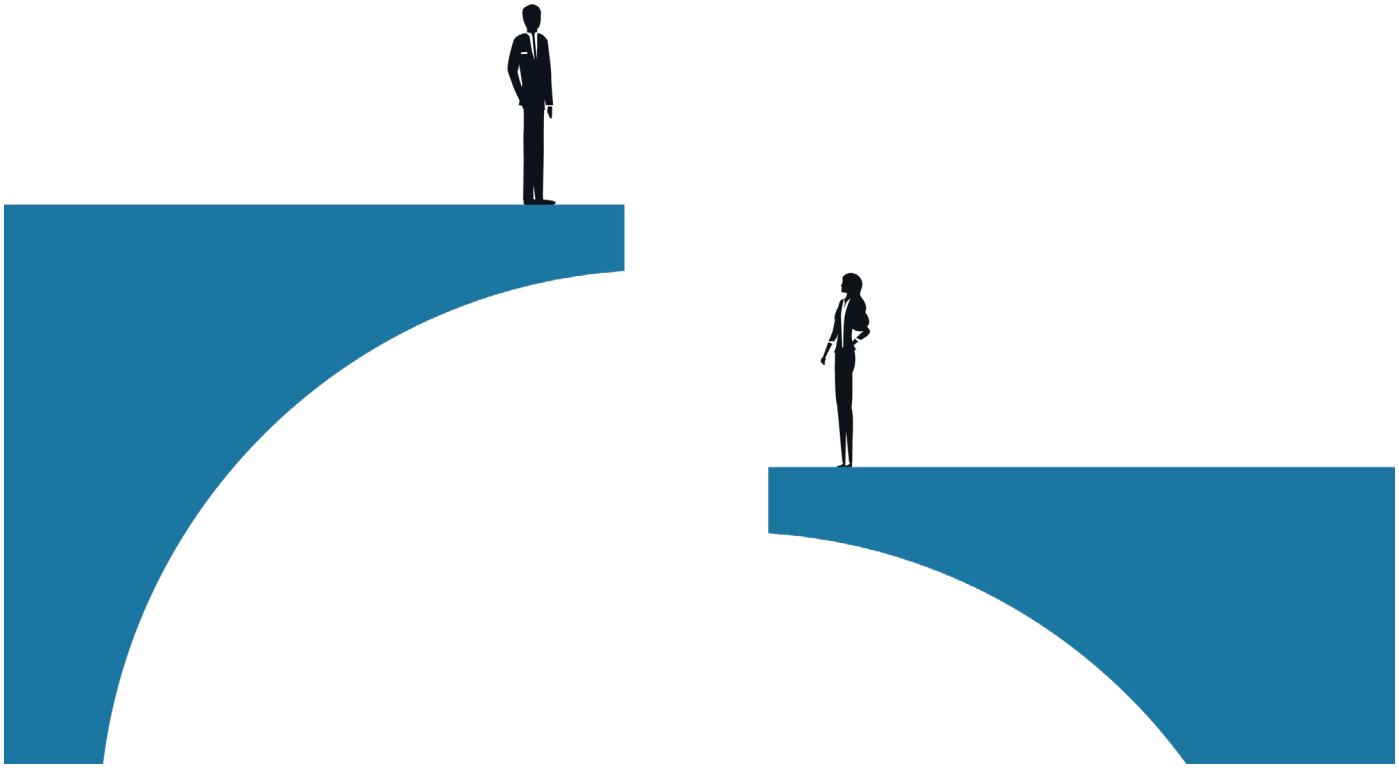
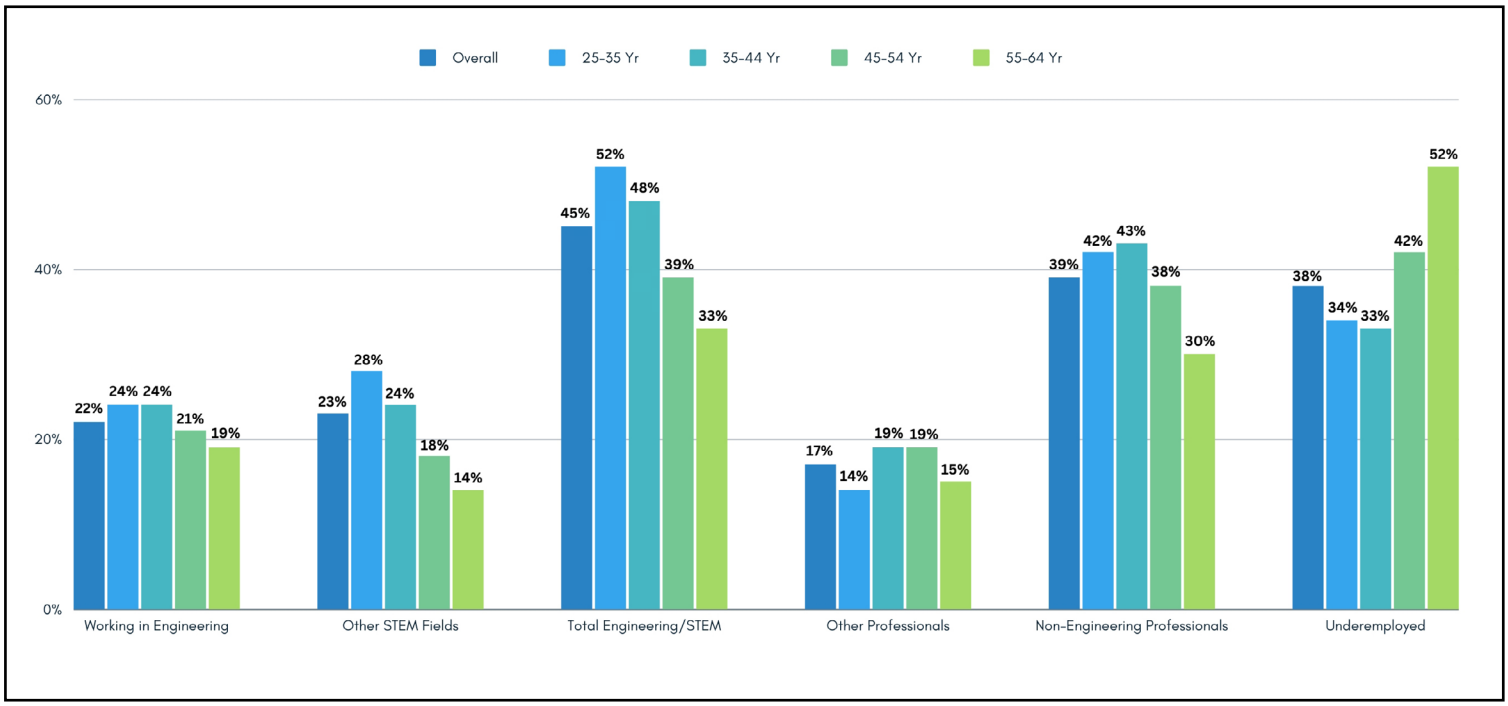


Figure 1.2: Proportion of Women Working in Different Employment Categories (2021)



Data Source: 2021 Canada Census

Key Observations

There is good and bad news for women with engineering degrees. First, the good news:

- **More women aged 25-44 with engineering degrees work in a STEM field than are underemployed.**
  - » This indicates that some of the barriers facing women in STEM are being broken.
- **Among women aged 25-34 with engineering degrees, 53 per cent work in a STEM field.**
  - » This implies that younger women are finding opportunities in target sectors.

Also of note:

- **More women aged 25-34 with engineering degrees work in non-engineering STEM positions than in engineering.**
  - » This trend is unique to this age bracket and may indicate that more young women view all STEM professions as attractive career choices, especially early in their careers. Alternately, it could also indicate that non-engineering STEM positions are more welcoming of women than those strictly in engineering.

The bad news concerns women later in their careers:

- **42 per cent of women with engineering degrees aged 45-54 are underemployed.**
- **52 per cent of women with engineering degrees aged 55-64 are underemployed**
  - » Underemployment is the most common employment category for women aged 45-64; these women are actually more likely to be underemployed than to work in STEM or another professional field.

COMPARING 2016 AND 2021

The circumstances of the 2021 Census were unique, as data was gathered in May 2021 amidst widespread COVID-19 lockdowns (the effects of which are very hard to determine).

Table 1.2: Changes in Overall Numbers of Ontarians with Engineering Degrees (2016-2021)

ONTARIO ENGINEERING DEGREE HOLDERS	OVERALL 2016 #	OVERALL 2021 #	% CHANGE
Total	222,630	259,595	17%
Men	179,275	205,580	15%
Women	43,355	54,015	25%
Working in Engineering	67,585	75,110	11%
Men	57,890	63,020	9%
Women	9,695	12,090	25%
Other STEM Fields	33,625	55,600	65%
Men	26,930	43,270	61%
Women	6,695	12,330	84%
Total Engineering/STEM	101,210	130,710	29%
Men	84,820	106,290	25%
Women	16,390	24,420	49%
Other Professionals	48,925	32,075	-34%
Men	38,410	23,125	-40%
Women	10,515	8.950	-15%
Non-Engineering Professionals	82,550	87,675	6%
Men	65,340	66,395	2%
Women	17,210	21,280	24%
Underemployed	72,495	96,810	34%
Men	56,045	76,165	36%
Women	16,450	20,645	26%

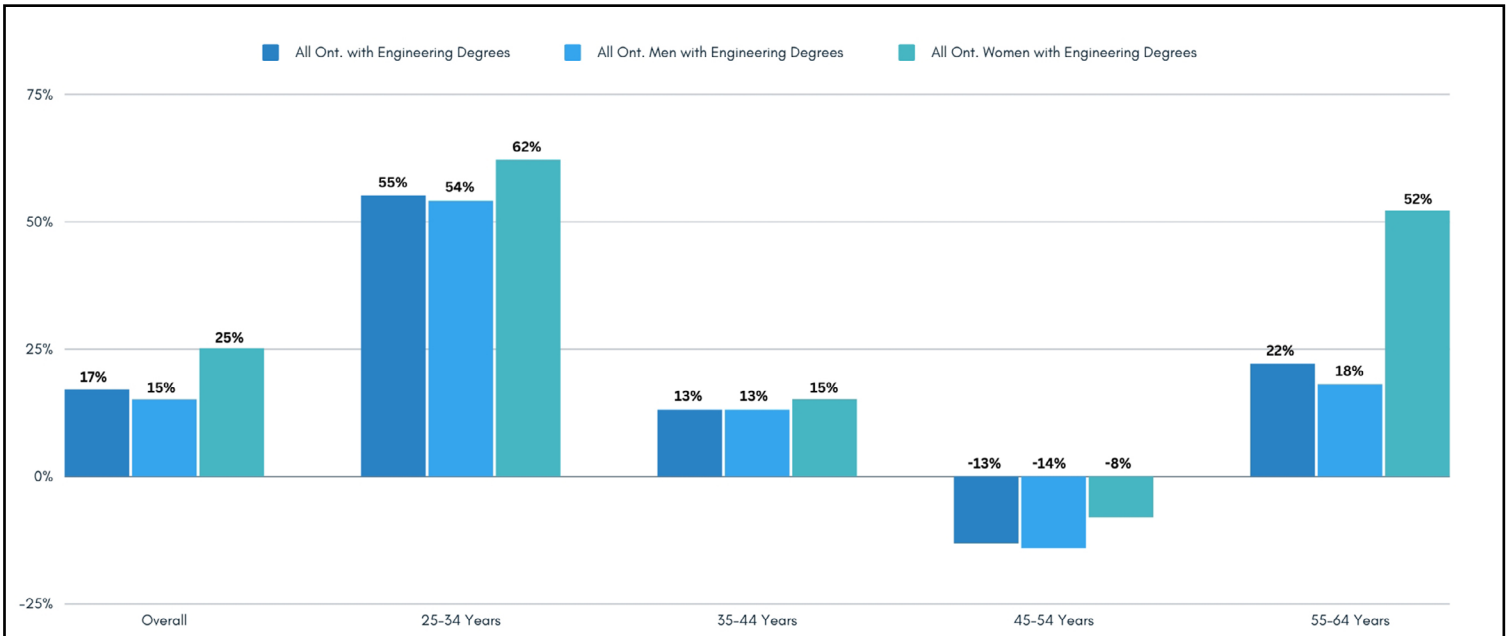
Data Source: 2021 Canada Census

Key Observations

Between 2016 and 2021...

- **The total number of Ontarians with engineering degrees increased by 11 per cent.**
- **The number of women with engineering degrees and those working in engineering both increased by 25 per cent.**
- **The number of women in non-engineering STEM positions increased by 84 per cent.**

Figure 1.3: Per Cent Change in Age Ranges of Engineering Graduates (2016-2021)



Data Source: 2021 Canada Census

- **The number of 25-34 year old Ontarians with engineering degrees increased by 55 per cent.**
  - » This trend is even more pronounced for 25-34 year old women (62 per cent increase). These figures clearly indicate that women are showing an increased interest in engineering.

INTERNATIONAL ENGINEERING GRADUATES

The picture of the engineering community is complicated when we compare Ontarians who earned their engineering degrees in Canada to International Engineering Graduates (IEGs). Those who earned degrees outside the country are usually immigrants to Canada, and Census data shows that the overwhelming majority of these immigrants are not working as engineers.

OSPE has been aware of this trend for some time, and it is one of the many reasons we have advocated for changes to the licensure program; more specifically, for the elimination of the Canadian experience requirement. (Encouragingly, PEO eliminated this requirement from their licence application criteria in May 2023, becoming Ontario's first professional regulator to do so.)

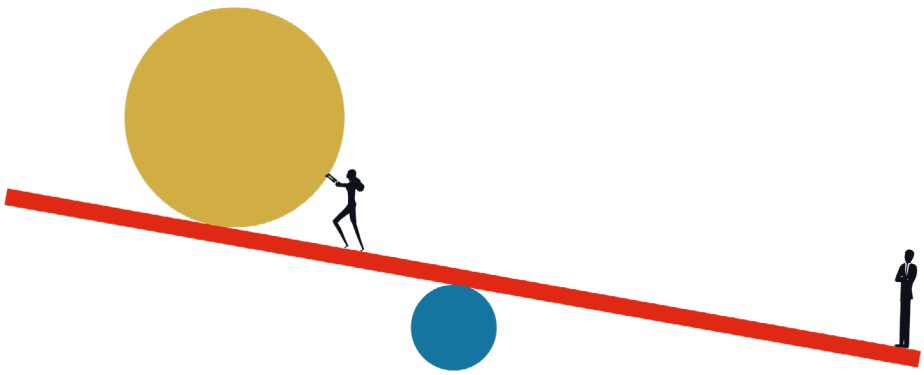


Table 1.3: Employment Categories and Origin of Engineering Degree

ONTARIO ENGINEERING DEGREE HOLDERS	DEGREE INSIDE CANADA	PROPORTION	DEGREE OUTSIDE CANADA	PROPORTION
Total	126,335	100%	133,285	100%
Men	103,520	82%	102,075	77%
Women	22,815	18%	31,210	23%
Working in Engineering	50,665	40%	24,450	18%
Men	42,565	41%	20,460	20%
Women	8,095	35%	3,995	13%
Other STEM Fields	25,410	20%	30,190	23%
Men	20,860	20%	22,400	22%
Women	4,550	20%	7,785	25%
Total Engineering/STEM	75,075	60%	54,640	41%
Men	63,425	61%	42,860	42%
Women	12,645	55%	11,780	38%
Other Professionals	18,570	15%	13,520	10%
Men	14,090	14%	9,035	9%
Women	4,475	20%	4,485	14%
Non-Engineering Professionals	43,980	35%	43,710	33%
Men	34,950	34%	31,435	31%
Women	9,025	40%	12,270	39%
Underemployed	31,685	25%	65,135	49%
Men	25,975	25%	50,180	49%
Women	5,690	25%	14,975	48%

Data Source: 2021 Canada Census

Key Observations

Table 1.3 compares all Ontarians with engineering degrees by their employment category and where they obtained their highest degree.

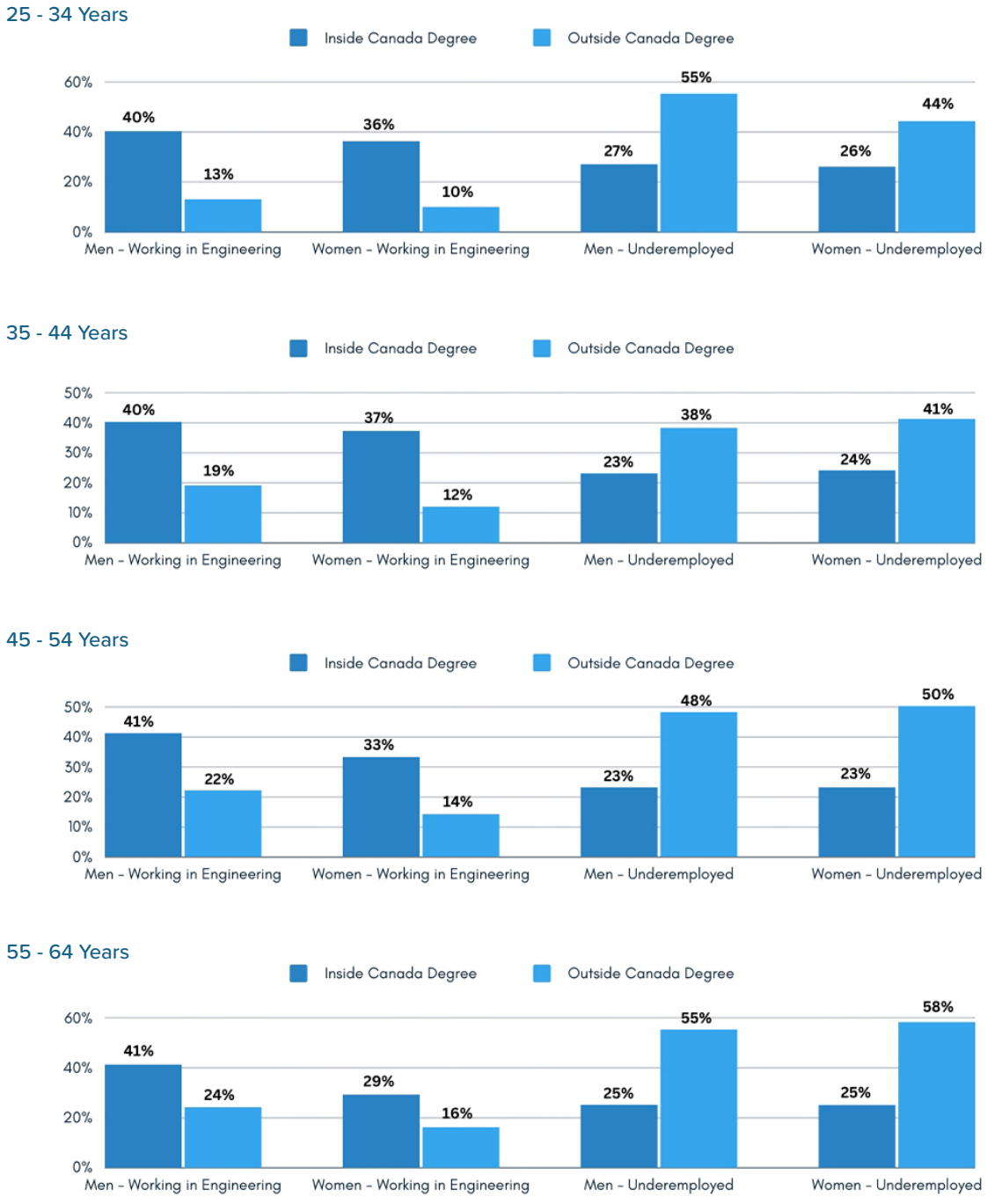
- **IEGs actually outnumber Ontarians with Canadian engineering degrees (133,285 vs 126,335).**
- **However, the proportion of Canadian degree holders working as engineers is more than twice as large as IEGs (40 per cent to 18 per cent).**
  - » As noted above, PEO removed the Canadian experience requirement from their licence application criteria this past May. It will be interesting to observe if this change helps increase the number of IEGs working as engineers in Ontario.
- **Likewise, the proportion of underemployed IEGs is nearly double that of Canadian degree holders (49 per cent to 25 per cent).**

It is worth noting that many IEGs do work in non-engineering STEM fields, especially information technology. Other notable trends for IEGs include the following:

- **Twice the proportion of IEGs (8 per cent) work in engineering technology positions, compared to Canadian degree holders (4 per cent).**
  - » This is considered as working in a related field, although these positions don't necessarily require an engineering degree.
- **12 per cent of male IEGs and 16 per cent of female IEGs work in retail sales and service (compared to only 6 per cent of Canadian degree holders).**

To further illustrate the employment discrepancies between these groups, consider the following tables:

Figure 1.4: Contrast Between IEGs and Canadian Degree Holders (By Age Range)



Data Source: 2021 Canada Census

These charts illustrate some harsh truths about employment rates for IEGs:

- **For IEGs aged 25-34, only 13 per cent of men and 10 per cent of women work in engineering.**
  - » This may be due to lack of experience prior to immigrating to Canada. Conditions improve over time for IEG men, increasing to 24 per cent by ages 55-64. Conditions for women also improve (albeit at a lower rate), rising to 16 per cent by ages 55-64.
- **Over half of male IEGs aged 25-34 are underemployed (55 per cent).**
  - » Conversely, underemployment is lowest for IEGS aged 35-44 – but their underemployment numbers are still much higher than those of Canadian degree holders.
- **58 per cent of female IEGs aged 55-64 are underemployed.**
  - » This is the highest underemployment rate of any group identified in the illustrations above. This is reflected in the proportion of women in this age group who work in retail sales and service (17 per cent).

What do these statistics say about the state of engineering employment for immigrants to Canada? It is hard to say, because this is a very diverse group. However, many IEGs who have taken OSPE's training courses share that they are surprised by the difficulty of finding engineering jobs. They were under the impression that it would not be hard to find meaningful work; in fact, many were encouraged to immigrate due to a perceived shortage of engineers in Canada.

With that said – the state of engineering licensure and employment in Ontario has continued to change since the Census was taken in 2021. We have already noted that PEO removed the Canadian experience requirement from their licensing criteria this past May. OSPE is eager to see how this and other developments will impact the future of Ontario's engineering workforce.

FINAL THOUGHTS

There are many conclusions that can be drawn from the 2021 Census data, and further analysis continues at OSPE.

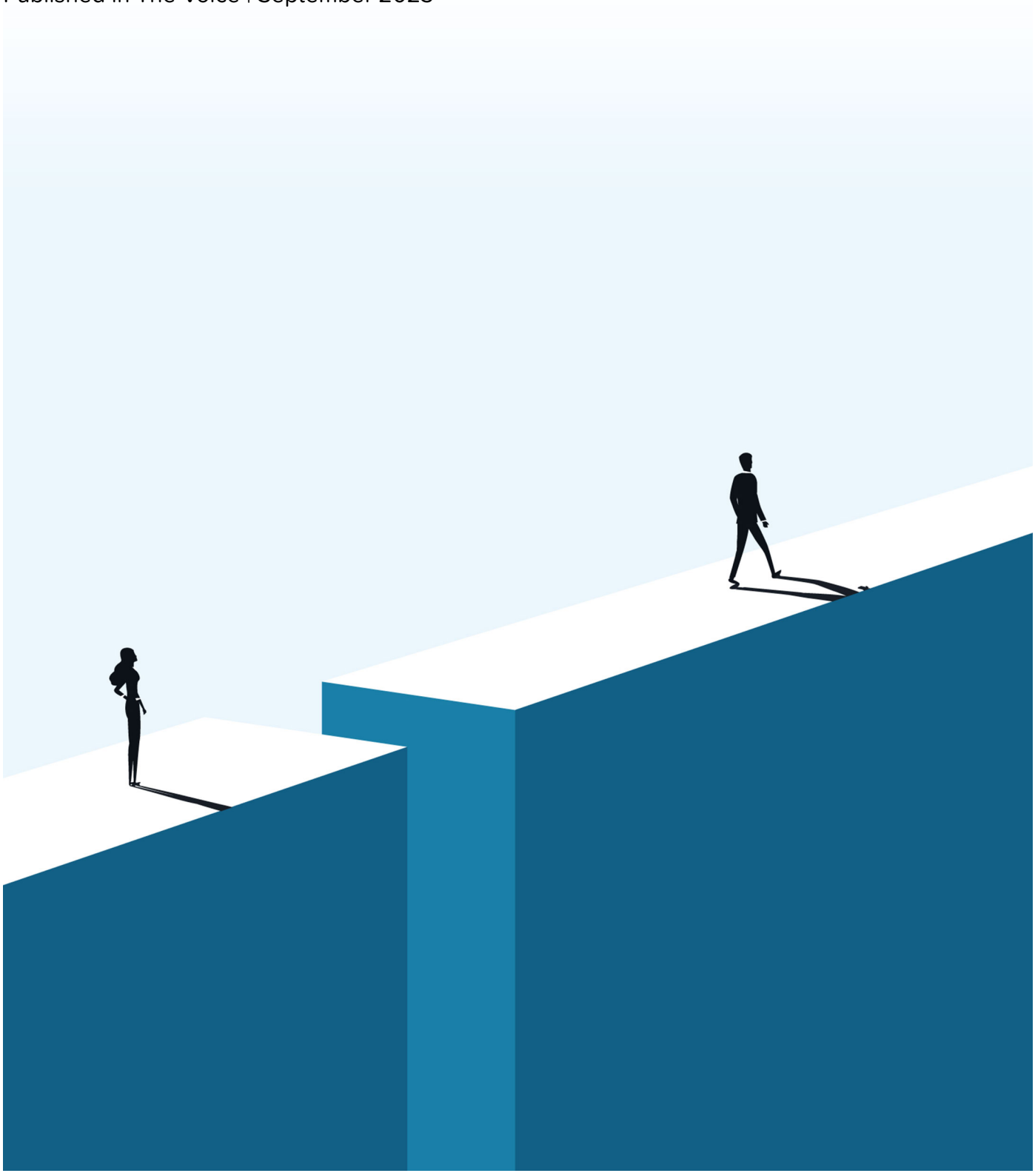
It is encouraging to see higher numbers of engineering graduates since 2016, and especially gratifying to see increases amongst women. OSPE's advocacy efforts and promotion of the engineering profession could be a factor in these trends.

However, the profession is still troubled by high numbers of engineering graduates who work in jobs that don't necessarily require an engineering degree. This is particularly pronounced amongst International Engineering Graduates.

All this data indicates that as things change, there are still significant barriers at play. OSPE will continue to report Census findings and identify how we can help engineering graduates trained in Ontario and internationally find meaningful work in their fields. The simple fact is that we need them; to drive innovation and remain globally competitive, Ontario's leaders must leverage the full range of engineering talent available in our province.

Engineering Earning Power: What Matters More? Where You Got Your Degree or Your Gender Identity?

Published in The Voice | September 2023



If you are an engineering graduate in Ontario, the simple truth is this: where you got your degree is a major factor in determining your income level. However, gender identity plays a large role as well. How do we know this? Earlier this year, OSPE analyzed 2021 Census data according to what types of jobs engineering graduates work in. Now, we have completed further analysis of income levels, measured by whether the degree is from Canada or abroad, and by gender.

NOTE

This analysis is limited to individuals aged 25-64 years who were employed at the time of the 2021 Census. Also, note that Census data does not distinguish between licensed engineers and non-licensed engineering graduates; therefore, all findings are based solely on individuals having a bachelor's degree (or higher) in engineering.

The types of jobs are defined as:

- **Working in Engineering:** Those working as an engineer or engineering manager (excluding software engineers).
- **Working in Other STEM Fields:** Those working in other STEM professions (including software engineering).
- **Other Professionals:** Those working in non-STEM jobs normally requiring a university degree.
- **Underemployed:** Those working in jobs that do not necessarily require a university degree, including engineering technologists.

**Being classified as underemployed does not reflect whether the occupation is lower-paying or lower-status. For example: engineering technologist positions do not normally require a university degree. A college diploma qualifies one to work in the profession, and thus, a graduate with an engineering degree working as an engineering technologist is deemed underemployed. Engineering technologists are certainly viewed as professionals by OSPE. On the other hand, underemployment also includes retail salespeople, construction workers, and taxi drivers, amongst many others.*

Major Observations

- **For Canadian degree holders working in engineering, the pay gap between women and men is narrow.**
  - » The gap ranges from 8 per cent (for 35-44 year-olds) to only 3 per cent (for 55-64 year-olds).
- **The pay gap between Canadian degree holders and International Engineering Graduates is wide in most job types.**
  - » For those working in engineering, it is as high as 34 per cent (for 55-64 year-olds).
- **The highest-paid Canadian degree holders are working in non-STEM professional positions.**
  - » These roles include policy analyst, professor, and manager / supervisor in finance or public service.
- **For Canadian degree holders, even jobs deemed as "underemployment" often pay well (over $100,000 annually).**
  - » These include management roles in utility and construction companies, as well as specialized sales positions. An engineering degree may be looked at favourably in hiring decisions, but these jobs do not necessarily require a degree.

INCOME IN ONTARIO: ENGINEERING GRADUATES WORKING IN ENGINEERING

Key Observations: Canadian Degree Holders

As reported in the June 2023 issue of The Voice, 40 per cent of Ontarians with Canadian engineering degrees work in engineering. The news for this cohort is positive.

- **As these graduates progress through their careers, their reported median income increases (from $76,907 for 25-34 year-olds to over $132,000 for those aged 45+).**
  - » The exception is men aged 55-64, who show a slight decrease in annual compensation.
- **The pay gap between women and men narrows over time.**
  - » The largest gap is for the 35-44 age group, in which women are paid 8 per cent less than men. By 55-64 years of age, the gap is only 3 per cent

Key Observations: International Engineering Graduates

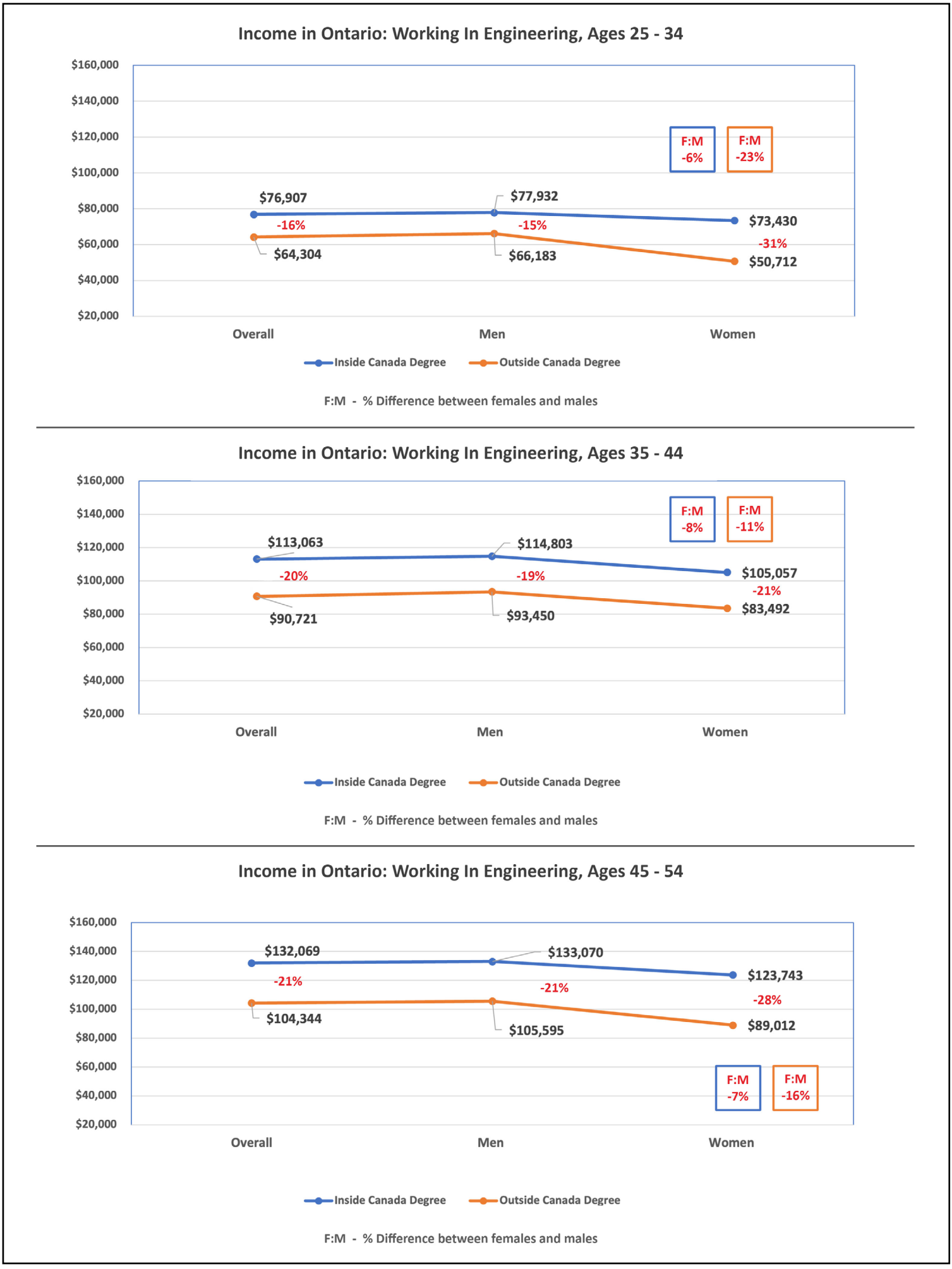
While findings are mostly positive for Canadian degree holders working in engineering, the same cannot be said for International Engineering Graduates (IEGs). As discussed in OSPE's June report, only 18 per cent of IEGs living in Ontario work in engineering.

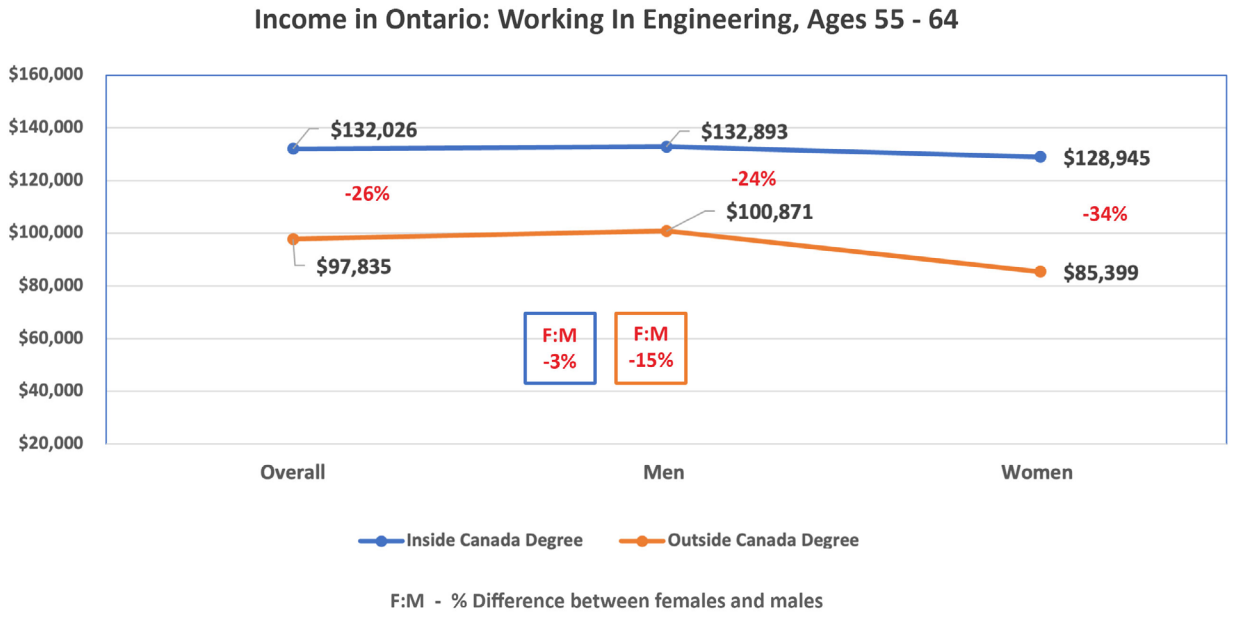
- **IEGs who work in engineering are paid far less than Canadian degree holders, even to the point of possible exploitation.**
  - » Figure 2.1 shows the glaring disparities in income. While IEGs aged 25-34 make 'only' 15 per cent less than men with Canadian degrees, this gap expands to 24 per cent for the 55-64 age bracket. Although their median income is just over $100,000, International Engineering Graduates are still making much less than their Canadian-educated counterparts.
- **The situation is even worse for internationally-trained women; across all age groups, IEG women make 21 to 34 per cent less than their Canadian-educated counterparts.**
  - » Furthermore, IEG women are compensated up to 23 per cent less than IEG men.

Figure 2.1 identifies income levels for engineering graduates working in engineering across all age brackets. These graphs present the following data for each bracket:

- income gap between Canadian degree holders and International Engineering Graduates
- weighted median income of individuals in the same degree category (Canadian / International)
- income gap between women and men in the same degree category (Canadian / International)

Figure 2.1: Income of Ontarians Working in Engineering





Source: 2021 Canada Census

Examples of specific types of engineering positions and their income gaps between Canadian educated, internationally educated, and male/female engineering graduates working are presented in Table 2.1.

Note that Tables 2.1 - 2.4 show example incomes of specific types of positions and are not weighted. They cannot be directly compared to data presented in Figures 2.1 - 2.4 as those are weighted averages over all types of positions.

Table 2.1: Examples of Median Salaries in All Age Ranges of Engineering Graduates Working in Engineering (Ontario)

Overall 25 - 34 Age Group Median	$ 75,000	$ 45,200	-40%	$ 68,500	$ 39,600	-42%
TYPE OF ENGINEERING POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Civil	$ 74,500	$ 55,600	-25%	$ 68,500	$ 50,800	-26%
Mechanical	$ 75,500	$ 60,000	-21%	$ 69,500	$ 56,800	-18%
Electrical and Electronics	$ 82,000	$ 74,500	-9%	$ 77,500	$ 50,800	-34%
Chemical	$ 76,000	$ 53,600	-29%	$ 78,500	$ 38,000	-52%
Average	$ 77,000	$ 60,925	-21%	$ 73,500	$ 49,100	-33%

Overall 35 - 44 Age Group Median	$ 114,000	$ 84,000	-26%	$ 99,000	$ 62,800	-37%
TYPE OF ENGINEERING POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Civil	$ 109,000	$ 79,500	-27%	$ 98,000	$ 74,500	-24%
Mechanical	$ 109,000	$ 87,000	-20%	$ 109,000	$ 77,500	-29%
Electrical and Electronics	$ 120,000	$ 92,000	-23%	$ 110,000	$ 82,000	-25%
Chemical	$ 103,000	$ 84,000	-18%	$ 98,000	$ 57,600	-41%
Average	$ 110,250	$ 85,625	-22%	$ 103,750	$ 72,900	-30%

Overall 45 - 54 Age Group Median	$ 127,000	$ 86,000	-32%	$ 114,000	$ 68,000	-40%
TYPE OF ENGINEERING POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Civil	$ 126,000	$ 102,000	-19%	$ 121,000	$ 85,000	-30%
Mechanical	$ 127,000	$ 98,000	-23%	$ 119,000	$ 94,000	-21%
Electrical and Electronics	$ 132,000	$ 111,000	-16%	$ 126,000	$ 111,000	-12%
Chemical	$ 138,000	$ 99,000	-28%	$ 119,000	$ 60,800	-49%
Average	$ 130,750	$ 102,500	-22%	$ 121,250	$ 87,700	-28%

Overall 55 - 64 Age Group Median	$ 125,000	$ 70,000	-44%	$ 111,000	$ 58,800	-47%
TYPE OF ENGINEERING POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Civil	$ 130,000	$ 95,000	-27%	$ 116,000	$ 85,000	-27%
Mechanical	$ 125,000	$ 97,000	-22%	$ 136,000	$ 83,000	-39%
Electrical and Electronics	$ 128,000	$ 105,000	-18%	$ 119,000	$ 84,000	-29%
Chemical	$ 133,000	$ 72,500	-45%	$ 138,000	$ 80,000	-42%
Average	$ 129,000	$ 92,375	-28%	$ 127,250	$ 83,000	-34%

The glaring gap between Canadian and International Engineering Graduates is evident when comparing overall median salaries of all respective age groups and genders. The narrowest gap is for all men with engineering degrees between 35 and 44 years old, at 26 per cent, to the widest gap, at 47 per cent for all women with engineering degrees in the 55 to 64 age range. Gaps in most age ranges are 40 per cent and above. However, for the example positions within job type categories, the average gap is narrower and ranges between a 21 per cent wage gap for 25 – 34 age range men working in engineering to 34 per cent for underemployed women aged 55 to 64 years old.

When looking at individual positions, salaries for Canadian educated men are near or slightly above the median average overall, while most all salaries for all women are at or above the overall average. IEG men are also all above the overall average in their respective categories. Percentage gaps between Canadian degree holders and IEGs demonstrate a wide range, from only 9 per cent for men aged 25 – 34 working as electrical and electronics engineers to a huge 52 per cent for women in the same age range working as chemical engineers. Women IEGs working as chemical engineers in all age ranges earn at least 40 per cent less than their Canadian educated counterparts.

INCOME IN ONTARIO: ENGINEERING GRADUATES IN OTHER STEM FIELDS

Non-Engineering STEM positions include those in computer and information technology industries (such as cybersecurity specialists and software designers). Figure 2.2 shows that, for engineering graduates up to age 45, these jobs pay more than engineering positions (regardless of whether one's degree comes from Canada or internationally).

Key Observations: Canadian Degree Holders

While only 20 per cent of Canadian engineering degree holders work in non-engineering STEM positions, they tend to do well in this sector:

- **These positions are especially lucrative for graduates aged 25-34.**
  - » They deliver higher salaries than all other types of jobs for this age group.
- **This employment category has the some of the narrowest income gaps between men and women.**
  - » Across all age brackets, the gap ranges from 7 to 21 per cent.

Key Observations: International Engineering Graduates

- **At 23 per cent, more IEGs work in non-engineering STEM positions than in engineering.**
  - » There are also more IEGs than Canadian degree holders working in this field.
- **The pay gaps between Canadian and IEGs in these roles are narrower than the gaps in engineering.**
  - » In fact, for men aged 25-34, the gap is only 3 per cent. But for other age brackets, the gap can approach 20 per cent.
- **As expected, women IEGs working these jobs are paid less than men.**
  - » However, the gaps are not as wide as those in engineering.

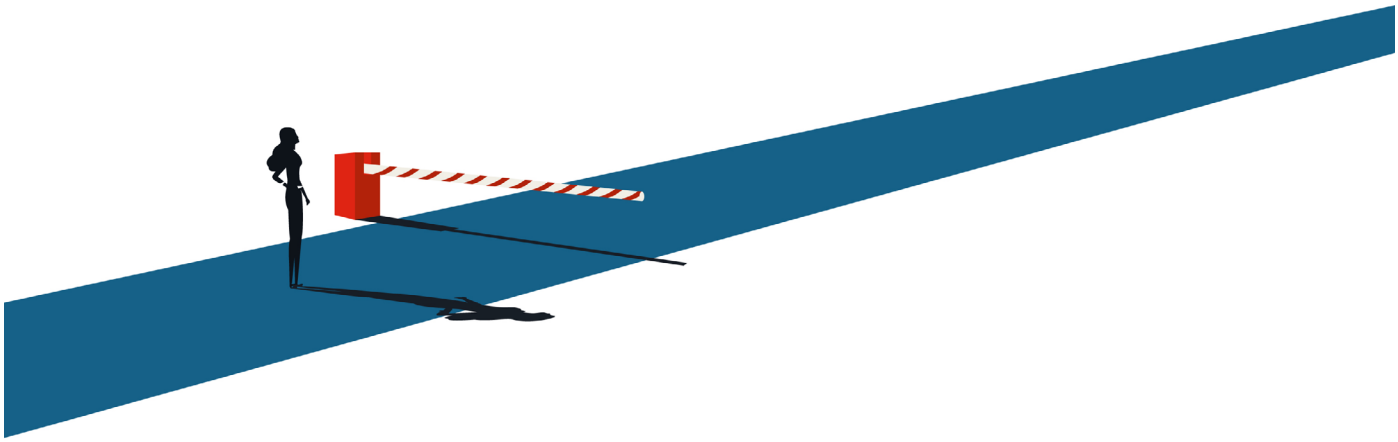
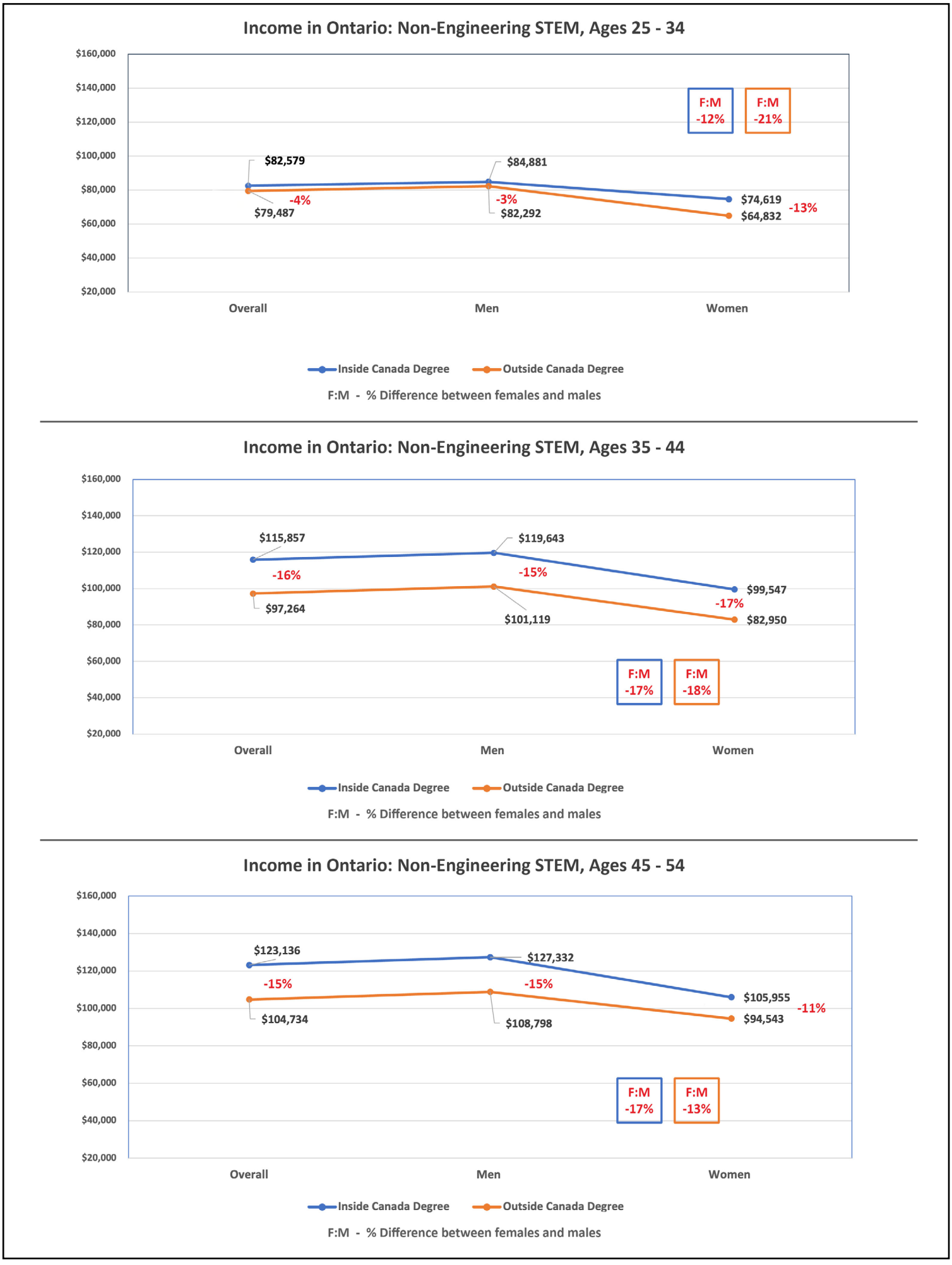
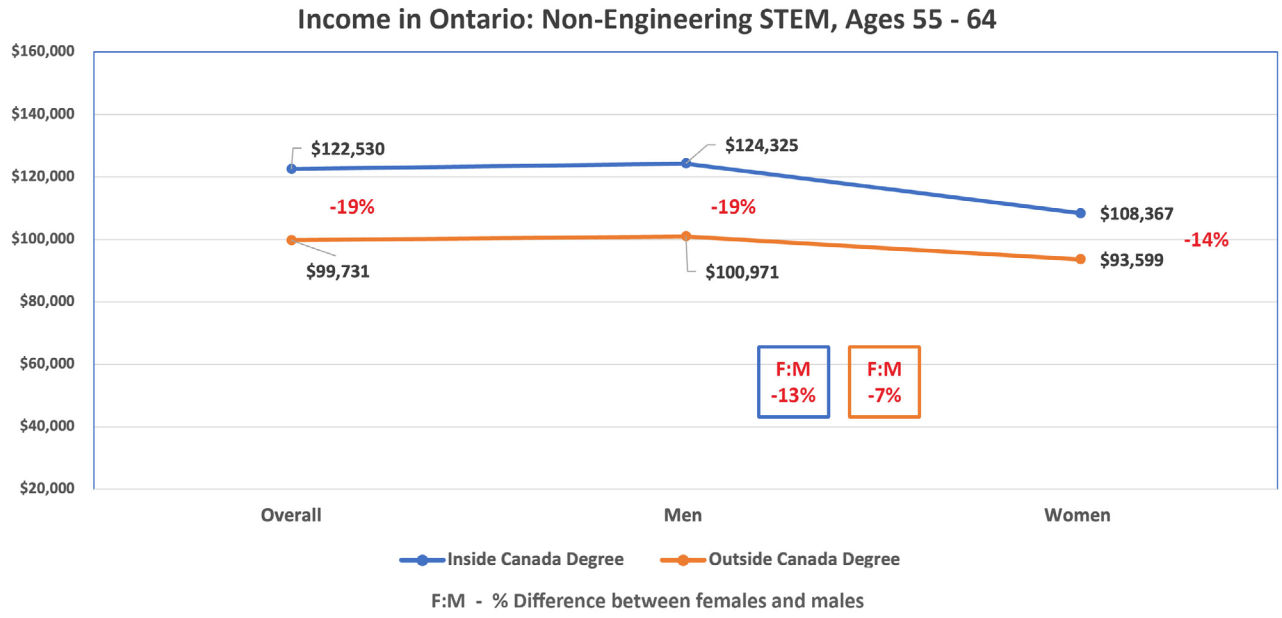


Figure 2.2 identifies income levels for engineering graduates working in non-engineering STEM positions across all age brackets. These graphs present the following data for each bracket:

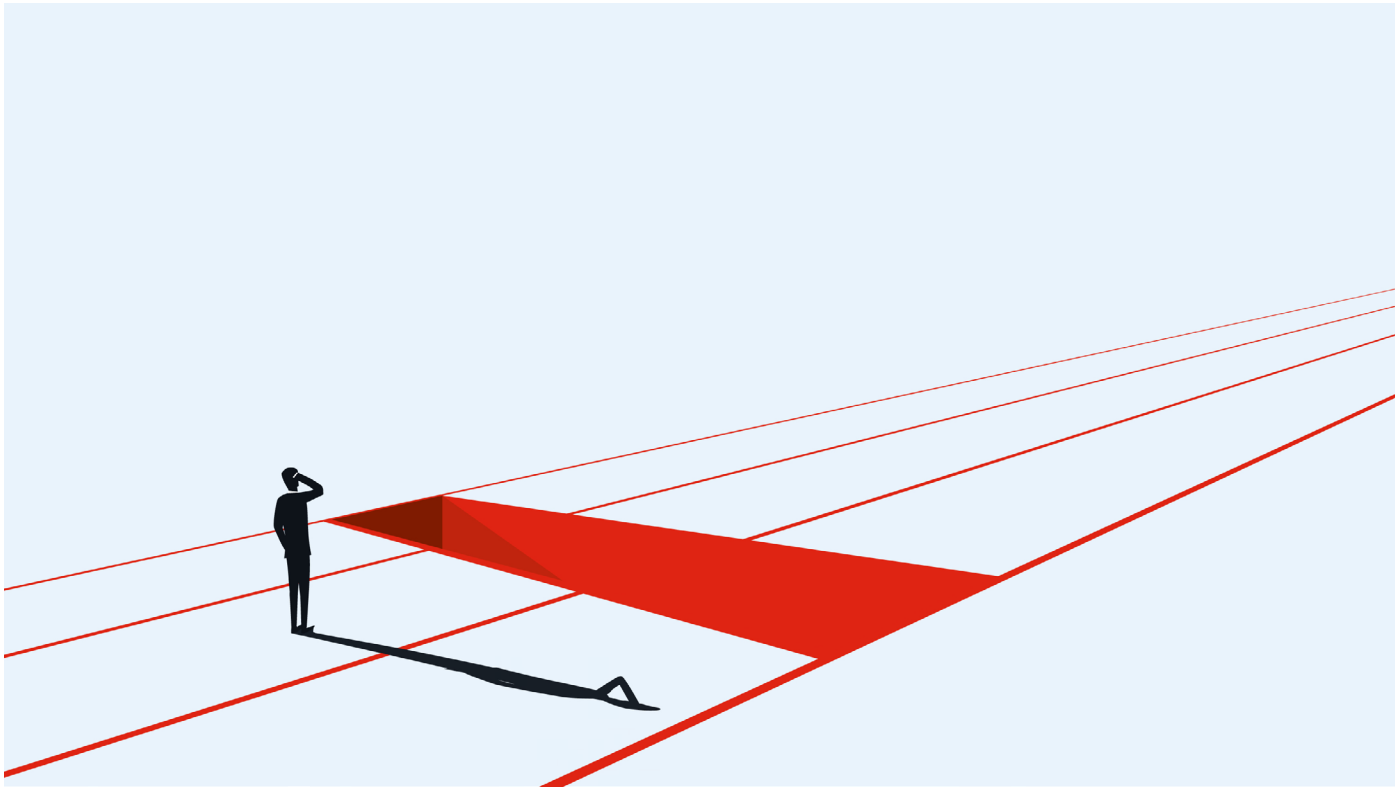
- income gap between Canadian degree holders and International Engineering Graduates
- weighted median income of individuals in the same degree category (Canadian / International)
- income gap between women and men in the same degree category (Canadian / International)

Figure 2.2: Income of Ontarians Working in Non-Engineering STEM Positions





Source: 2021 Canada Census



Examples of specific types of non-engineering STEM positions and their income gaps between Canadian educated, internationally educated, and male/female engineering graduates are presented in Table 2.2.

Table 2.2: Examples of Median Salaries in All Age Ranges of Engineering Graduates Working in Non-Engineering STEM Positions (Ontario) (page 22)

Overall 25 - 34 Age Group Median	$ 75,000	$ 45,200	-40%	$ 68,500	$ 39,600	-42%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL :CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Computer and information systems	$ 113,000	$ 96,000	-15%	$ 98,000	$ 63,200	-36%
Information systems specialists	$ 72,500	$ 82,000	13%	$ 67,500	$ 64,500	-4%
Software engineers and designers	$ 91,000	$ 84,000	-8%	$ 88,000	$ 71,500	-19%
Software developers and programmers	$ 85,000	$ 82,000	-4%	$ 76,000	$ 64,500	-15%
Average	$ 90,375	$ 86,000	-3%	$ 82,375	$ 65,925	-18%

Overall 35 - 44 Age Group Median	$ 114,000	$ 84,000	-26%	$ 99,000	$ 62,800	-37%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL :CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Computer and information systems	$ 149,000	$ 118,000	-21%	$ 127,000	$ 105,000	-17%
Information systems specialists	$ 105,000	$ 96,000	-9%	$ 91,000	$ 80,000	-12%
Software engineers and designers	$ 121,000	$ 105,000	-13%	$ 101,000	$ 83,000	-18%
Software developers and programmers	$ 113,000	$ 99,000	-12%	$ 102,000	$ 76,500	-25%
Average	$ 122,000	$ 104,500	-14%	$ 105,250	$ 86,125	-18%

Overall 45 - 54 Age Group Median	$ 127,000	$ 86,000	-32%	$ 114,000	$ 68,000	-40%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL :CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
information systems managers	$ 160,000	$ 132,000	-18%	$ 126,000	$ 112,000	-11%
Information systems specialists	$ 120,000	$ 100,000	-17%	$ 113,000	$ 90,000	-20%
Software engineers and designers	$ 133,000	$ 120,000	-10%	$ 120,000	$ 104,000	-13%
Software developers and programmers	$ 120,000	$ 100,000	-17%	$ 95,000	$ 93,000	-2%
Average	$ 133,250	$ 113,000	-15%	$ 113,500	$ 99,750	-12%

Overall 55 - 64 Age Group Median	$ 125,000	$ 70,000	-44%	$ 111,000	$ 58,800	-47%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL :CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
information systems managers	$ 156,000	$ 127,000	-19%	$ 100,000	$ 112,000	12%
Information systems specialists	$ 116,000	$ 96,000	-17%	$ 113,000	$ 92,000	-19%
Software engineers and designers	$ 132,000	$ 113,000	-14%	$ 135,000	$ 90,000	-33%
Software developers and programmers	$ 120,000	$ 100,000	-17%	$ 121,000	$ 98,000	-19%
Average	$ 131,000	$ 109,000	-17%	$ 117,250	$ 98,000	-15%

Compared to working in engineering (and other job types), the gap between Canadian educated and IEGs are generally narrow. Especially for men in the 25 – 34 age range, the overall gap is only 3 per cent. Indeed, for Information Systems Specialists in that age group, IEGs earn 13 per cent more than their Canadian educated counterparts. The widest gap is for women in the 25 – 34 age range working in Computer and Information Systems, at 36 per cent. In general, the gaps over all positions range between 10 and 18 per cent for both men and women.

As mentioned earlier in this section, pay is high in this job category. Even 25 – 34 years old Canadian educated men working in Computer and Information Systems make over $100,000. Salaries are typically well over $100,000 for both Canadian educated men and women, as well as many IEG men and a few IEG women. While gaps between men and women are narrower than other job types, women are nonetheless paid lower than men in most all specific positions.

INCOME IN ONTARIO: ENGINEERING GRADUATES IN OTHER PROFESSIONAL ROLES

Jobs in this non-STEM category (such as educational services, business, and finance positions) normally require a university degree, and an engineering degree is viewed favourably. There are few generalizations that can be made about Canadian and International Engineering Graduates for this job type. However, two things are clear: those aged 35+ are generally well-compensated, and there are significant gaps in income depending on where an engineering graduate obtained their degree (Figure 2.3).

Key Observations: Canadian Degree Holders

- **Canadian engineering graduates who work in this category command the highest salaries of any employment type–for men.**
  - » If money is the primary motivator, young men with Canadian degrees may want to start their career in these professions, as Census data suggest salaries are very high after age 35.
- **Although salaries for younger people in this category are lower than those for engineering or other STEM jobs (around $62,000), salaries surprisingly almost double to $118,000 by age 35+.**
  - » By age 55+, men in this category command over $150,000 annually.
- **Disturbingly, women aged 55-64 earn almost 30 per cent less in these positions.**
  - » Across all age ranges, women in these positions earn at least 17 per cent less than their male counterparts.

Key Observations: International Engineering Graduates

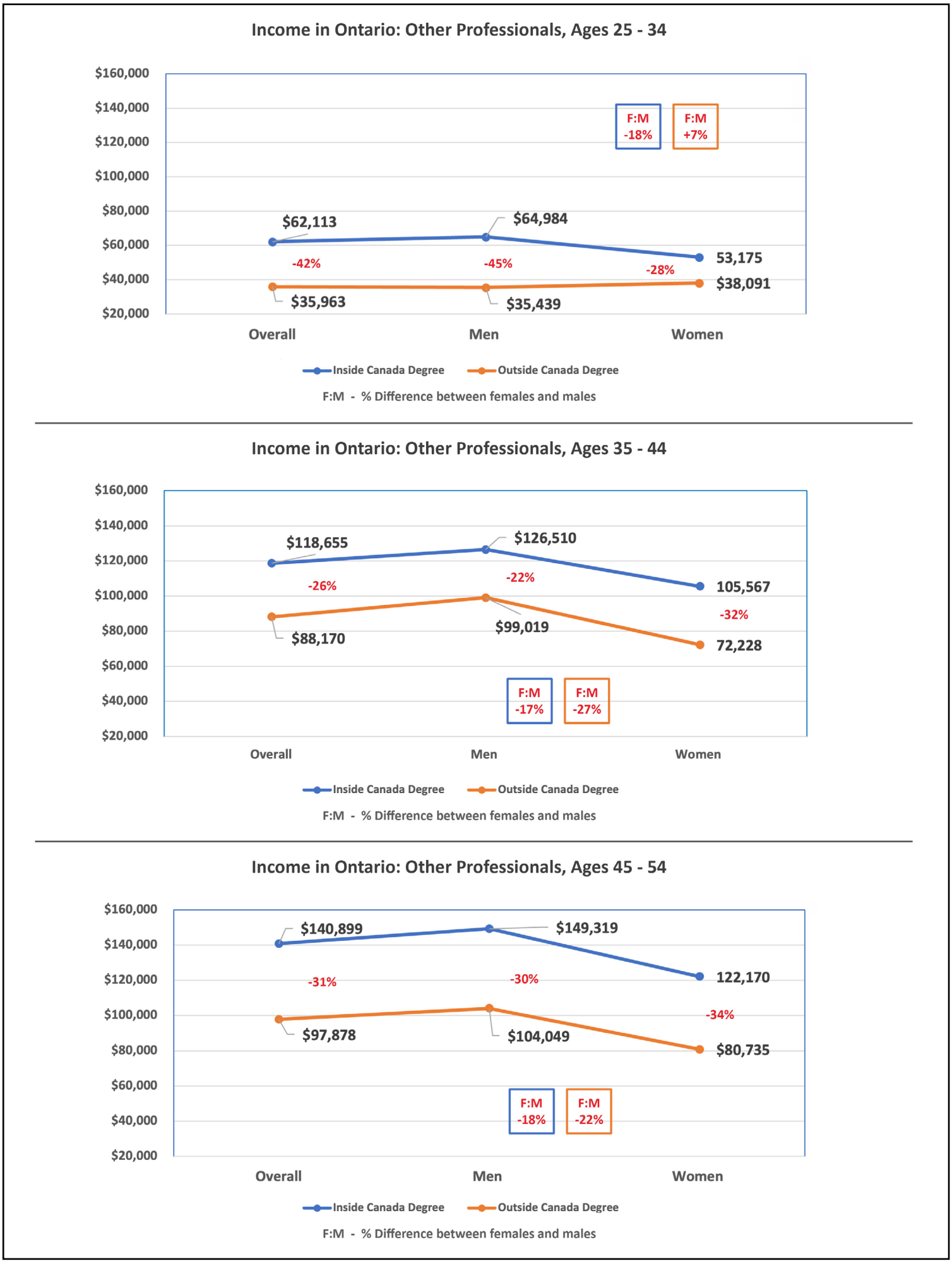
Figure 2.3 highlights the significant pay gaps between Canadian and International Engineering Graduates working in this category.

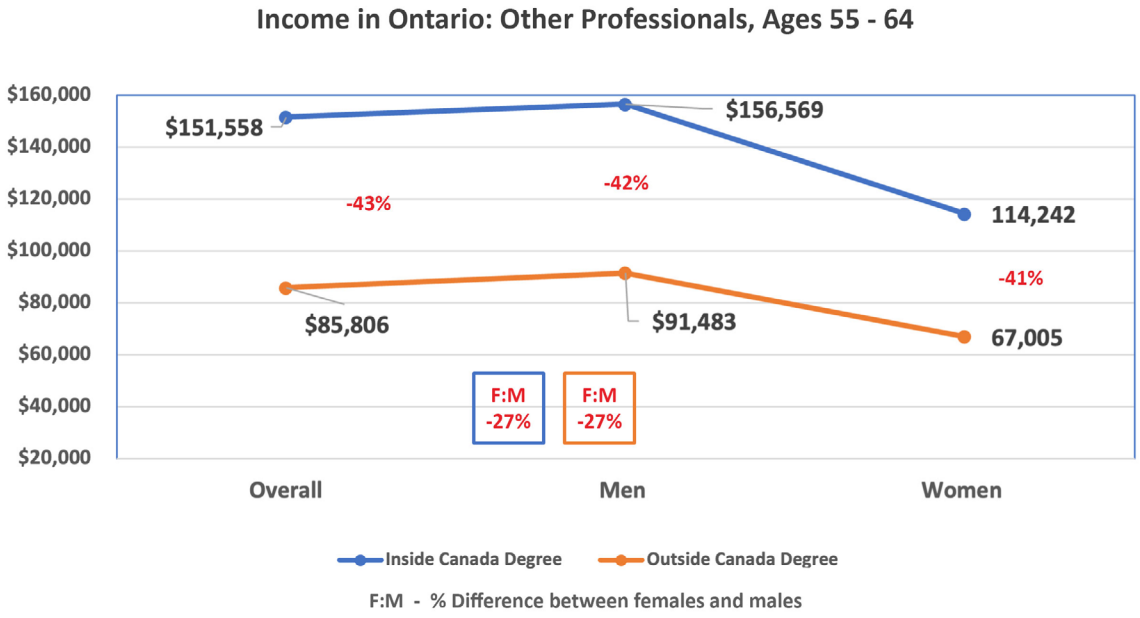
- **Income gaps are glaringly wide–up to 45 per cent.**
  - » Although only 10 per cent of International Engineering Graduates work in this category, they are clearly paid less than their Canadian counterparts.
- **The largest gaps affect those in older age brackets, particularly those aged 55+.**
  - » For both men and women IEGs aged 55+, salaries actually go down from the prior age range.

Figure 2.3 identifies income levels for engineering graduates working in other professional roles across all age brackets. These graphs present the following data for each bracket:

- income gap between Canadian degree holders and International Engineering Graduates
- weighted median income of individuals in the same degree category (Canadian / International)
- income gap between women and men in the same degree category (Canadian / International)

Figure 2.3: Income of Ontarians Working in Other Professional Roles





Source: 2021 Canada Census

Examples of specific types of non-STEM Other Professional positions and their income gaps between Canadian educated, internationally educated, and male/female engineering graduates are presented in Table 2.2.

Income gaps between Canadian educated and IEGs in each job type are lower than the average income of all engineering graduates in their respective job type, although some gaps are near the average. Significant gaps exist in specific positions, however. For example, men IEG auditors, accountants, and investment professionals in the age range of 55 – 64 earn 59 per cent less than their Canadian educated counterparts. The largest gap for women is for those 45 – 54 years of age working in professional occupations in education services, at 53 per cent.

Education services is an interesting variable. This category includes all teachers from kindergarten through elementary and secondary schools to college and university instructors and professors. Post secondary teaching and research assistants are also listed. So, the low salaries reported by 25 to 34-year-old engineering graduates in this category make sense as many of them would still be graduate students.

For both Canadian educated and IEG men, salaries are quite high for those over 45. Table 2.3 is somewhat misleading, however, as it shows the average of all types of education services positions. When filtered to only university professors and lecturers, IEG men clearly earn more than their Canadian educated counterparts. In the 45 – 54 age range, IEGs earn $174,000 while Canadian educated are paid $159,000. For 55 to 64-year-old professors, Canadian educated earn $186,000 and IEGs, $192,000.

Except for university professors, it is difficult to ignore that immigrants may be taken advantage of by being paid much less than Canadian educated engineering graduates in seemingly the same positions.

Table 2.3: Examples of Median Salaries in All Age Ranges of Engineering Graduates Working in Other Professional Positions (Ontario) (next page)

Overall 25 - 34 Age Group Median	$ 75,000	$ 45,200	-40%	$ 68,500	$ 39,600	-42%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Specialized middle management occupations in administrative services, financial and business services and communication	$ 90,000	$ 56,400	-37%	$ 82,000	$ 66,000	-20%
Professional occupations in business management consulting	$ 82,000	$ 76,000	-7%	$ 78,500	$ 61,600	-22%
Auditors, accountants and investment professionals	$ 85,000	$ 44,000	-48%	$ 70,000	$ 62,000	-11%
Professional occupations in education services	$ 17,400	$ 13,600	-22%	$ 15,800	$ 12,000	-24%
Average	$ 68,600	$ 47,500	-29%	$ 61,575	$ 50,400	-19%

Overall 35 - 44 Age Group Median	$ 114,000	$ 84,000	-26%	$ 99,000	$ 62,800	-37%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Specialized middle management occupations in administrative services, financial and business services and communication	$ 133,000	$ 116,000	-13%	$ 116,000	$ 95,000	-18%
Professional occupations in business management consulting	$ 118,000	$ 97,000	-18%	$ 96,000	$ 81,000	-16%
Auditors, accountants and investment professionals	$ 122,000	$ 93,000	-24%	$ 99,000	$ 60,400	-39%
Professional occupations in education services	$ 96,000	$ 56,400	-41%	$ 84,000	$ 43,600	-48%
Average	$ 117,250	$ 90,600	-24%	$ 98,750	$ 70,000	-30%

Overall 45 - 54 Age Group Median	$ 127,000	$ 86,000	-32%	$ 114,000	$ 68,000	-40%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Specialized middle management occupations in administrative services, financial and business services and communication	$ 145,000	$ 104,000	-28%	$ 137,000	$ 95,000	-31%
Professional occupations in business management consulting	$ 111,000	$ 88,000	-21%	$ 120,000	$ 89,000	-26%
Auditors, accountants and investment professionals	$ 101,000	$ 62,800	-38%	$ 99,000	$ 79,500	-20%
Professional occupations in education services	$ 115,000	$ 119,000	3%	$ 102,000	$ 48,400	-53%
Average	$ 118,000	$ 93,450	-21%	$ 114,500	$ 77,975	-32%

Overall 55 - 64 Age Group Median	$ 125,000	$ 70,000	-44%	$ 111,000	$ 58,800	-47%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Specialized middle management occupations in administrative services, financial and business services and communication	$ 162,000	$ 75,000	-54%	$ 142,000	$ 75,000	-47%
Professional occupations in business management consulting	$ 120,000	$ 58,800	-51%	N/A	$ 75,000	N/A
Auditors, accountants and investment professionals	$ 110,000	$ 44,800	-59%	N/A	$ 66,500	N/S
Professional occupations in education services	$ 119,000	$ 114,000	-4%	$ 86,000	$ 75,000	-13%
Average	$ 127,750	$ 73,150	-42%	$ 114,000	$ 72,875	-30%

Examples of specific types of non-STEM Other Professional positions and their income gaps between Canadian educated, internationally educated, and male/female engineering graduates are presented in Table X (below).

Income gaps between Canadian educated and IEGs in each job type are lower than the average income of all engineering graduates in their respective job type, although some gaps are near the average. Significant gaps exist in specific positions, however. For example, men IEG auditors, accountants, and investment professionals in the age range of 55 – 64 earn 59 per cent less than their Canadian educated counterparts. The largest gap for women is for those 45 – 54 years of age working in professional occupations in education services, at 53 per cent.

Education services is an interesting variable. This category includes all teachers from kindergarten through elementary and secondary schools to college and university instructors and professors. Post secondary teaching and research assistants are also listed. So, the low salaries reported by 25 to 34-year-old engineering graduates in this category make sense as many of them would still be graduate students.

For both Canadian educated and IEG men, salaries are quite high for those over 45. Table 2.3 is somewhat misleading, however, as it shows the average of all types of education services positions. When filtered to only university professors and lecturers, IEG men clearly earn more than their Canadian educated counterparts. In the 45 – 54 age range, IEGs earn $174,000 while Canadian educated are paid $159,000. For 55 to 64-year-old professors, Canadian educated earn $186,000 and IEGs, $192,000.

Except for university professors, it is difficult to ignore that immigrants may be taken advantage of by being paid much less than Canadian educated engineering graduates in seemingly the same positions.

INCOME IN ONTARIO: UNDEREMPLOYED ENGINEERING GRADUATES

While jobs in this category do not necessarily require a university degree, that doesn't automatically mean that they aren't bona-fide careers. Indeed, Figure 2.4 shows that men with Canadian engineering degrees can earn high salaries in many of these jobs. The figures also show that, no matter where they obtained their degree, women in this field have consistently lower pay than their male counterparts.

Key Observations: Canadian Degree Holders

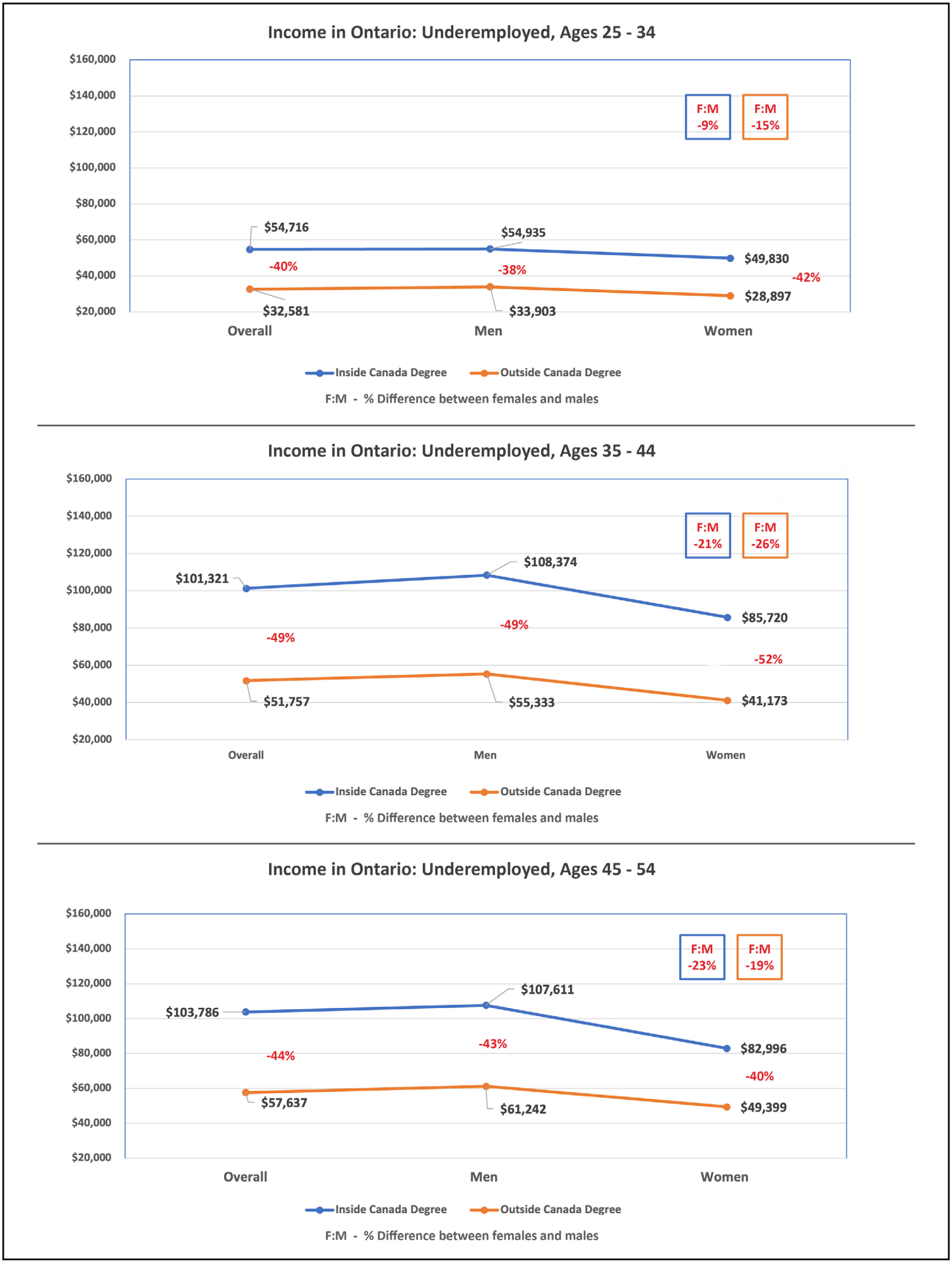
- **At 25 per cent, underemployment is the second most common category for engineering graduates with Canadian degrees.**
  - » The Census does not measure the reasons why engineering graduates work in these jobs, so we cannot determine if they choose these professions or are unable to find work in other sectors.
- **Younger people in this employment category earn lower wages than workers in other categories. But for men aged 35-44, median salaries double to over $100,000.**
  - » In fact, underemployed men with Canadian degrees have annual salaries near or above $100,000 right up to age 64.
- **Women in this category have much lower salaries from age 35 onward–the lowest of any job type.**
  - » By age 55, these women are making 28 per cent less than their male counterparts.

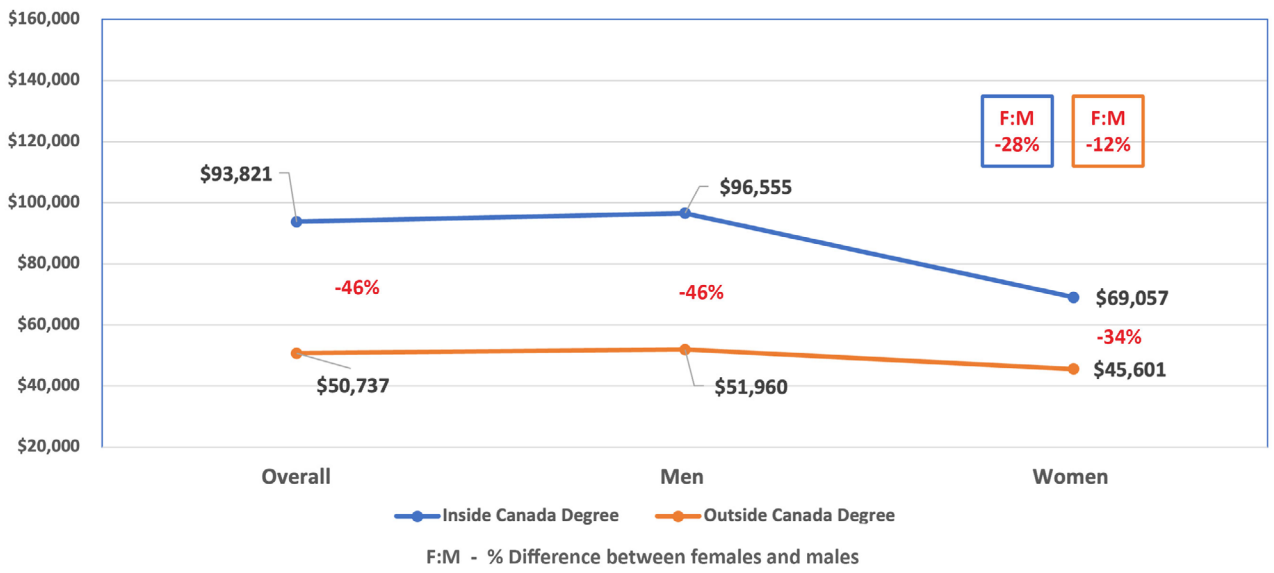
Table 4 identifies several positions that command high salaries for men with Canadian engineering degrees. Management jobs in the utility and construction industries pay very well, and an engineering degree is likely useful in these positions. However, these jobs do not necessarily require a degree.

Figure 2.4 identifies income levels for "underemployed" engineering graduates across all age brackets. These graphs present the following data for each bracket:

- income gap between Canadian degree holders and International Engineering Graduates
- weighted median income of individuals in the same degree category (Canadian / International)
- income gap between women and men in the same degree category (Canadian / International)

Figure 2.4: Income of Underemployed Ontarians





Source: 2021 Canada Census

Key Observations: International Engineering Graduates

- Almost half (49 per cent) of International Engineering Graduates are underemployed. and their salaries are much lower than those of Canadian degree holders.
- Many of these are 'survival' jobs simply to make ends meet. These include sales and service positions such as cashiers, and machine operators/assemblers.
- IEGs in this category make around 50 percent less than Canadian degree holders.
- The gaps are glaringly large, ranging up to 49 per cent less pay for IEG men and 52 per cent for IEG women in the 35-44 age bracket. It is a strong possibility that these individuals did not choose to work in survival jobs; rather, they were borne out of necessity to support themselves and their families.
- Interestingly, IEG women with middle management positions in retail, trade, and customer services make more money than IEG men working the same positions.
- Regardless, though, all these people have engineering degrees–and certainly, this education does not prepare them for sales and service roles. And the income gap between Canadian and International Engineering Graduates in this category is extreme; IEG men make 64 per cent less than Canadian degree holders.

Table 2.4 shows specific jobs and the income dichotomy between Canadian and International Engineering Graduates who are underemployed. Even if some positions pay international degree holders quite well (over $100,000), they still make significantly less than their Canadian educated counterparts. Clearly there is discrimination (and possibly exploitation) of these workers.

For specific examples, Canadian educated men between the ages of 45 and 54 working as retail and wholesale trade managers earn $102,000 while IEGs in the same position make $50,400 – about 50 per cent less for the same job title. For women aged 25 – 34, salaries for Canadian educated engineering graduates working as managers in manufacturing and utilities are $92,000 (a decent wage for that age group) while IEG women only earn $56,000, a 39 per cent difference for the same job title.

These figures are important as we've seen that this job category is the second largest for Canadian educated engineering graduates and the largest for IEGs. The difference is Canadian educated in general earn a decent wage and likely consider their jobs as long-term careers. Indicators for IEGs suggest, however, they likely take these positions as 'survival' jobs and low paying at that. While they may desire to find more career-oriented jobs in their field, they nonetheless are likely to be in these jobs long-term whether they want to or not.

Table 2.4: Examples of Median Salaries in All Age Ranges of Underemployed Engineering Graduates (Ontario)
(next page)

Overall 25 - 34 Age Group Median	$ 75,000	$ 45,200	-40%	$ 68,500	$ 39,600	-42%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Technical occupations related to natural and applied sciences	$ 54,000	$ 43,600	-19%	$ 55,200	$ 37,600	-32%
Middle management occupations in retail and wholesale trade and customer services	$ 71,500	$ 34,400	-52%	$ 69,500	$ 32,400	-53%
Technical occupations in the arts, culture and sports	$ 73,000	$ 61,600	-16%	$ 49,200	$ 54,000	10%
Managers in manufacturing and utilities	$ 93,000	$ 79,500	-15%	$ 92,000	$ 56,000	-39%
Average	$ 72,875	$ 54,775	-25%	$ 66,475	$ 45,000	-29%

Overall 35 - 44 Age Group Median	$ 114,000	$ 84,000	-26%	$ 99,000	$ 62,800	-37%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Technical occupations related to natural and applied sciences	$ 85,000	$ 70,500	-17%	$ 73,000	$ 66,500	-9%
Middle management occupations in retail and wholesale trade and customer services	$ 123,000	$ 81,000	-34%	$ 91,000	$ 67,000	-26%
Technical occupations in the arts, culture and sports	$ 118,000	$ 94,000	-20%	$ 127,000	$ 40,000	-69%
Managers in manufacturing and utilities	$ 140,000	$ 103,000	-26%	$ 144,000	$ 99,000	-31%
Average	$ 116,500	$ 87,125	-24%	$ 108,750	$ 68,125	-34%

Overall 45 - 54 Age Group Median	$ 127,000	$ 86,000	-32%	$ 114,000	$ 68,000	-40%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Technical occupations related to natural and applied sciences	$ 91,000	$ 76,500	-16%	$ 79,500	$ 70,500	-11%
Middle management occupations in retail and wholesale trade and customer services	$ 137,000	$ 50,000	-64%	$ 85,000	$ 56,000	-34%
Technical occupations in the arts, culture and sports	$ 139,000	$ 97,000	-30%	$ 115,000	$ 83,000	-28%
Managers in manufacturing and utilities	$ 155,000	$ 111,000	-28%	$ 202,000	$ 97,000	-52%
Average	$ 130,500	$ 83,625	-35%	$ 120,375	$ 76,625	-31%

Overall 55 - 64 Age Group Median	$ 125,000	$ 70,000	-44%	$ 111,000	$ 58,800	-47%
TYPE OF POSITION	MEN: CANADIAN DEGREE	MEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)	WOMEN: CANADIAN DEGREE	WOMEN: INTERNATIONAL DEGREE	% DIFFERENCE (INTERNATIONAL: CANADIAN)
Technical occupations related to natural and applied sciences	$ 91,000	$ 72,500	-20%	$ 114,000	$ 60,800	-47%
Middle management occupations in retail and wholesale trade and customer services	$ 121,000	$ 37,200	-69%	$ 103,000	$ 32,000	-69%
Technical occupations in the arts, culture and sports	$ 102,000	$ 83,000	-19%	N/A	$ 75,500	N/A
Managers in manufacturing and utilities	$ 137,000	$ 88,000	-36%	N/A	$ 103,000	N/A
Average	$ 112,750	$ 70,175	-36%	$ 108,500	$ 67,825	-58%

FINAL THOUGHTS

The good news for men is that those with Canadian engineering degrees are making a decent living, no matter what type of job they make as their career. Women with engineering degrees from inside Canada–especially those working in engineering–are also making very good wages. (They fare quite well in other types of jobs as well.)

What is disturbing is that no matter what job they have, women are making less than their male counterparts. The gaps are relatively narrow for those working in engineering, but are certainly wider in other professions. Census results show gender indeed does make a difference in what engineering graduates make.

The obvious bad news is for those with degrees from outside Canada. Except for non-engineering STEM jobs, International Engineering Graduates make significantly less than those with degrees from inside Canada.

OSPE knows many immigrants to Canada who have become disheartened at the difficulty in securing decent jobs. They migrate to Canada under the impression they will not have a problem finding work in engineering; but as we see by the Census, half of them end up underemployed in low-paying jobs that do not necessarily require a degree.

With provincial government funding, OSPE has trained many International Engineering Graduates with job search skills and career counselling. At the end of the most recent project, over 80 per cent of participants were employed. OSPE hopes more funding will become available through the government's Bridge Training Programs for internationally trained immigrants, as the need is great.

Most Engineering Graduates Aren't Becoming Engineers

See how engineering grad employment trends compare to other professional disciplines.

Published in The Voice | December 2023

While 40 per cent of engineering graduates with degrees from inside Canada work in their field of study, this is a lower proportion than other professional disciplines such as Math/Computer/Information Science (Math+), Business, Education, and Law. How do we know this? OSPE has reviewed 2021 Canada Census data and has conducted in-depth analysis of what types of jobs engineering graduates work in and their income (see the June 2023 and September 2023 Voice Magazines) and now, comparisons of types of jobs with other professions. A more in-depth analysis of jobs deemed underemployed is also presented.

The analysis was limited to individuals who were employed at the time of the census and aged between 25 and 64 years. The census does not distinguish between licensed engineers or non-licensed engineering graduates nor certifications or credentials of other professions and thus all findings reported are based solely on individuals having a bachelor's degree or higher in engineering, math+, business, education, and law.

Comparisons between people who earned degrees from inside and outside Canada are also offered.

The types of jobs are defined as:

- **Work in Field:** Those who identify as working in a career requiring a degree and that is the same as the discipline of their degree.
- **Non-Field Science Technology Engineering Mathematics (STEM):** STEM graduates working in other STEM professions than their discipline and which normally require a degree. The professions in this category include all forms of software development, cybersecurity, information management, mathematics, etc. Collectively we refer to them as math+.
- **Professionals:** Those working in non-STEM jobs normally requiring a university degree.
- **Underemployed:** Those working in jobs that do not ***necessarily*** require a university degree.

Note that being classified as underemployed does not reflect whether the occupation is lower paying or lower status. For example, engineering technologist positions do not normally require a university degree. A college diploma qualifies one to work in the profession and thus a graduate with an engineering degree working as an engineering technologist is deemed underemployed. Engineering technologists are certainly viewed as professionals by OSPE. Similarly, graduates with a business degree may indeed work in related professions, but the census lists those as administrative or support jobs and thus may not necessarily require a university degree.

Major Observations

- At 40 per cent, engineering graduates working in engineering ***and*** having a degree from inside Canada, is the lowest proportion of disciplines working in their field of study compared to the other professions analyzed.
- Unsurprisingly, education and law degree holders have the highest proportions of graduates working in their field or study.
- Except for math+, IEGs are far more likely to be underemployed than those with degrees from inside Canada.
- The bright spot for IEG math+ degree holders is that a higher proportion of them work in their field than are underemployed, with 51 per cent working in math+ fields and only 34 per cent underemployed. In fact, IEGs with math+ degrees show the lowest proportion of underemployed than all other types of degree holders in this analysis.

All data presented here represent Ontarians between 25 and 64 years old with degrees in the aforementioned disciplines. This means all statistics presented about, for example, business, are people with their degree being a bachelor's or higher in business.

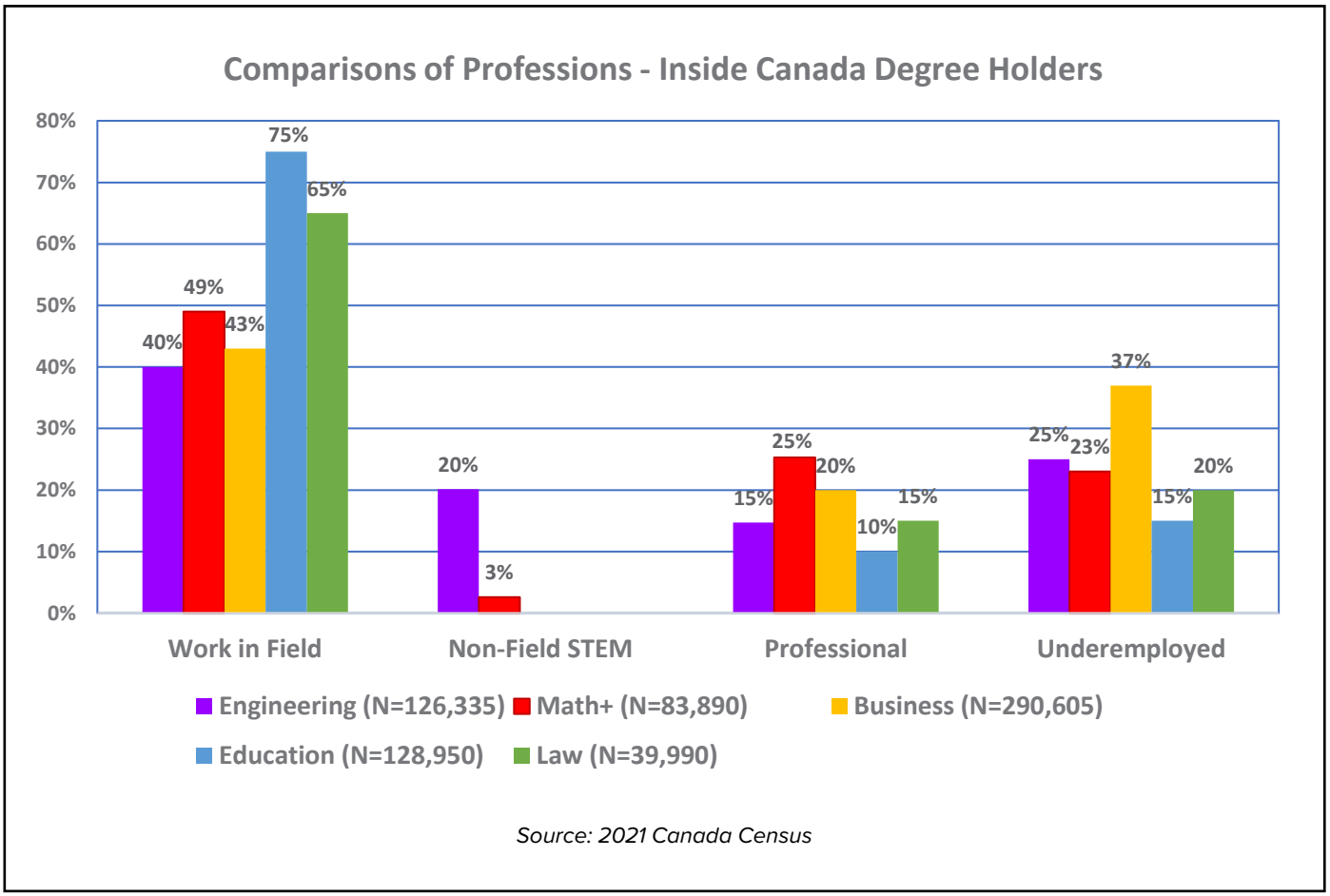
Figure 3.1 shows the percentage of people with respective degrees from inside Canada who work in different types of jobs.

Key Observations: Inside Canada Degree Holders

With 40 per cent of engineering graduates working in engineering, the discipline has the lowest proportion of graduates working in their field of study. Business degree holders have slightly more graduates (43 per cent) working in their field of study and almost half of math+ degree holders (49 per cent). The professions with by far most of their graduates working in their fields are education (75 per cent) and law (65 per cent). If non-engineering STEM positions are looked at, 60 per cent of engineering graduates work in STEM, which is approaching comparability with law.

There is a greater range of proportions for those underemployed. Only 15 per cent of education degree holders work in jobs deemed underemployment. Law, math+, and engineering are in similar proportions ranging from 20 per cent for law graduates to 25 per cent for engineering graduates. Much higher proportions of business degree holders are underemployed (37 per cent). See section below for a more in-depth discussion of what is meant by underemployment.

Figure 3.1: Proportion of Canadian Degree Holders from Different Disciplines in Types of Jobs (N=total number of degree holders in that discipline).



Source: 2021 Canada Census

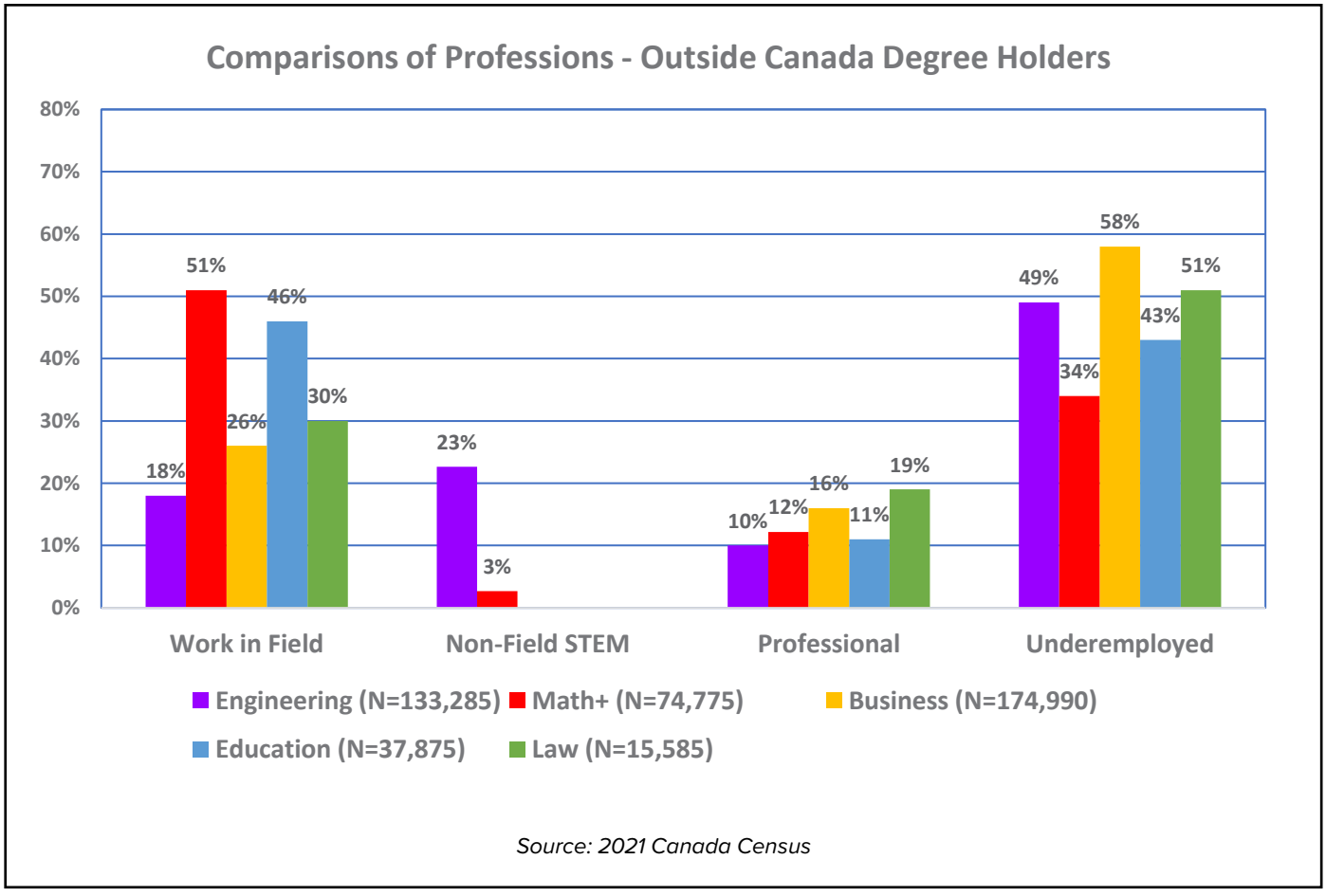
Key Observations: Internationally Educated Graduates

Figure 3.2 shows the percentage of people with respective degrees from outside Canada who work in different types of jobs.

Discussion of IEGs with engineering degrees was presented in the June 2023 Voice. We emphasized that a greater proportion of IEGs work in non-engineering STEM professions than in engineering. This was attributed to many IEGs working for IT companies. Emphasis was also placed on showing that just about half of IEGs were underemployed.

When compared with other professions, at only 18 per cent, IEGs with engineering degrees have the lowest proportion working in their field of study than other disciplines. IEGs with math+ (Math/Computer/Information Science) fare much better than all other IEGs with degrees in the disciplines studied. Over half of math+ IEGs work in their field of study. Close behind are IEGs with education degrees (46 per cent), largely attributable to the high number of teachers/ professors in post-secondary institutions. Far fewer IEGs with law (30 per cent) and business (26 per cent) work in their field of study.

Figure 3.2: Proportion of Outside Canada Degree Holders from Different Disciplines in Types of Jobs (N=total number of degree holders in that discipline).



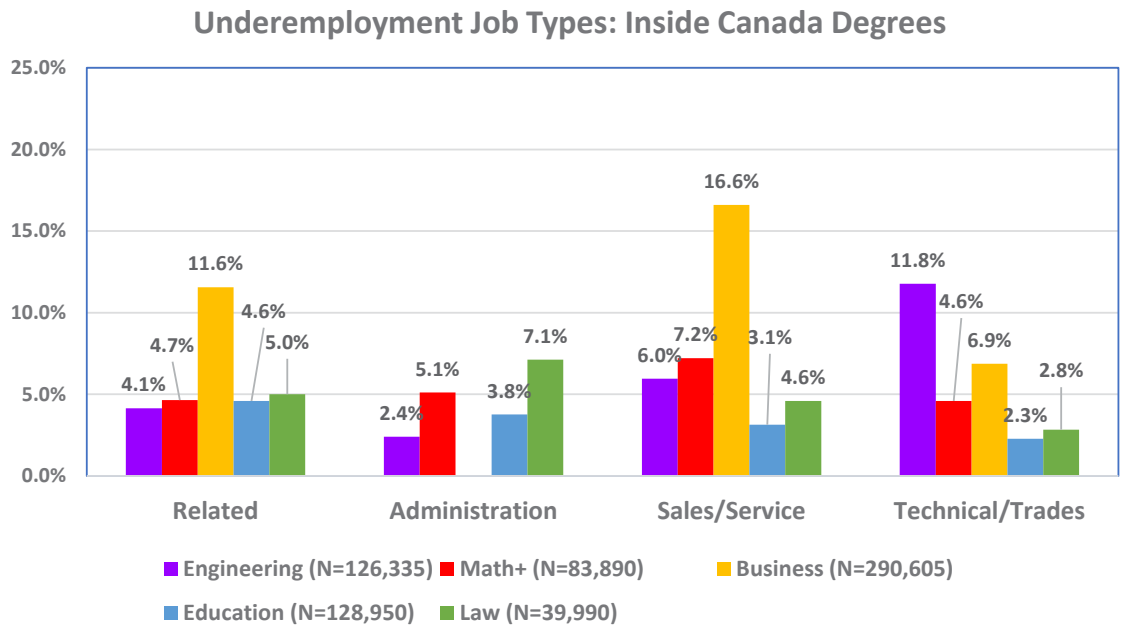
Source: 2021 Canada Census

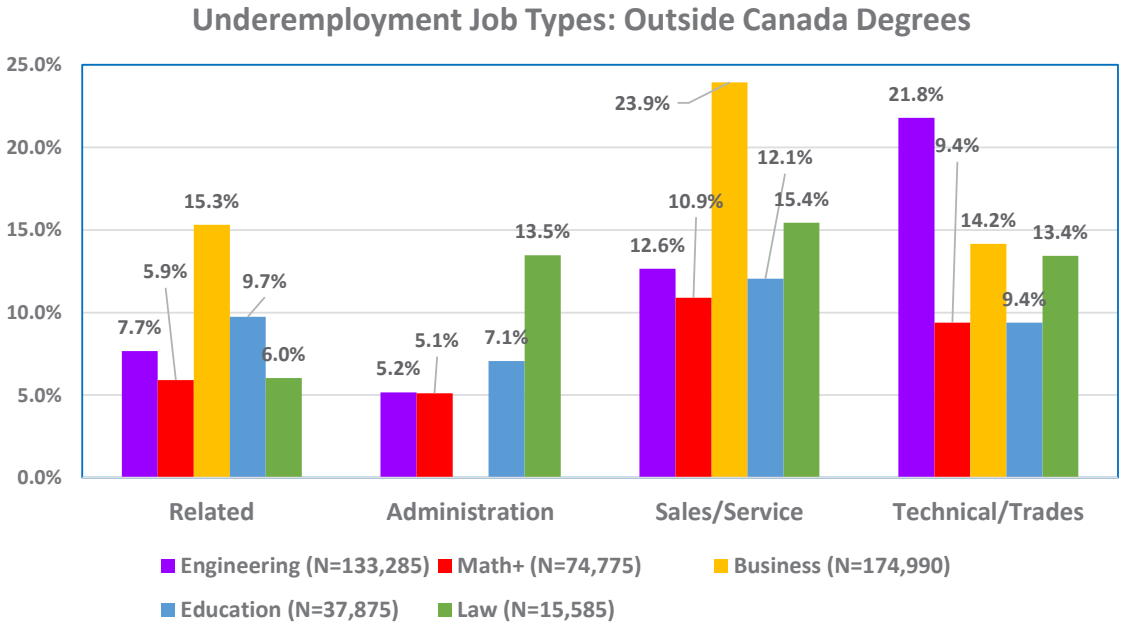
IEGs with business degrees have the highest rate of underemployment (58 per cent), but law (51 per cent) and engineering (49 per cent) degree holders are not far behind. Those with math+ degrees have the lowest proportion of underemployed (34 per cent) than any other discipline. The following section goes in more detail about underemployment.

WHAT DO WE MEAN BY UNDEREMPLOYMENT?

As discussed previously (June and Sept. 2023 editions of the Voice) for engineering degree holders with degrees from Canada being underemployed does not infer making a low income or not being in a career-oriented job. Underemployed but Canadian educated graduates with the degrees analyzed for this article are likely in career-oriented and generally well-paying jobs, but which do not necessarily require an engineering degree. For example, senior level supervisors in utilities. Whereas IEGs may be stuck in 'survival' jobs to just make enough money to get by. This has been the case with many IEGs that have taken courses for IEGs at OSPE. Comparisons of types of jobs deemed underemployed by discipline and location of degree are offered in Figure 3.

Figure 3.3: Types of Underemployment Jobs Held by Discipline and Location of Degree (N=total number of degree holders in that discipline).





Source: 2021 Canada Census

In Figure 3.3, 'Related' jobs are those within the same category (e.g., business) but in positions not necessarily requiring a degree. For engineering, this would be engineering technicians/technologists. 'Administration' jobs are those under business and includes business support. 'Sales/Service' include retail and wholesale trade as well as restaurant workers and sales managers. Technical/Trades are all types of technical, transportation, utilities, and trades (both skilled and unskilled) jobs but those not classified under the same name as the respective discipline. These include labourers but also senior level supervisors, all of whom do not necessarily require a degree.

For engineering graduates with degrees from inside Canada, most of those underemployed have found work in technical industries. There is a wide range of these types of jobs and include construction, manufacturing, transportation, and utilities. As demonstrated in the September 2023 Voice, many of these are well-paying positions.

For other disciplines, except for business degree holders, if underemployed, are relatively evenly spread proportionately in other types of jobs. The exception is business, which has a relatively high percentage of degree holders working in related or sales/service jobs. Note 'Administration' is blank for business degree holders as those who are underemployed are counted, by definition, as 'Related'.

The most impactful observations come from review of IEG underemployment. IEGs in all types of jobs and over all disciplines have higher rates of underemployment than engineering graduates with degrees from inside Canada. For engineers, the proportion of IEGs is around twice as much as those who are Canadian educated. Most underemployed IEGs work in sales/services (13 per cent) and especially in technical/trades (22 per cent). Many of these jobs are in management but many are likely not related directly to an engineering education. Many other jobs IEGs work in are 'survival' jobs such as food couriers, machinery technicians, or general labourers. The bottom line is that there is a lot of wasted talent, and many companies are missing out on the skills IEGs bring to Canada at a time when industry is calling out that there is a significant skills shortage in the workforce.

FINAL THOUGHTS

For engineering graduates with degrees from inside Canada, the employment rate in engineering or non-engineering STEM positions, at 60 per cent, is quite favourable. Having said this, there are other professions that have higher proportions of graduates working in their field of study, such as education and law.

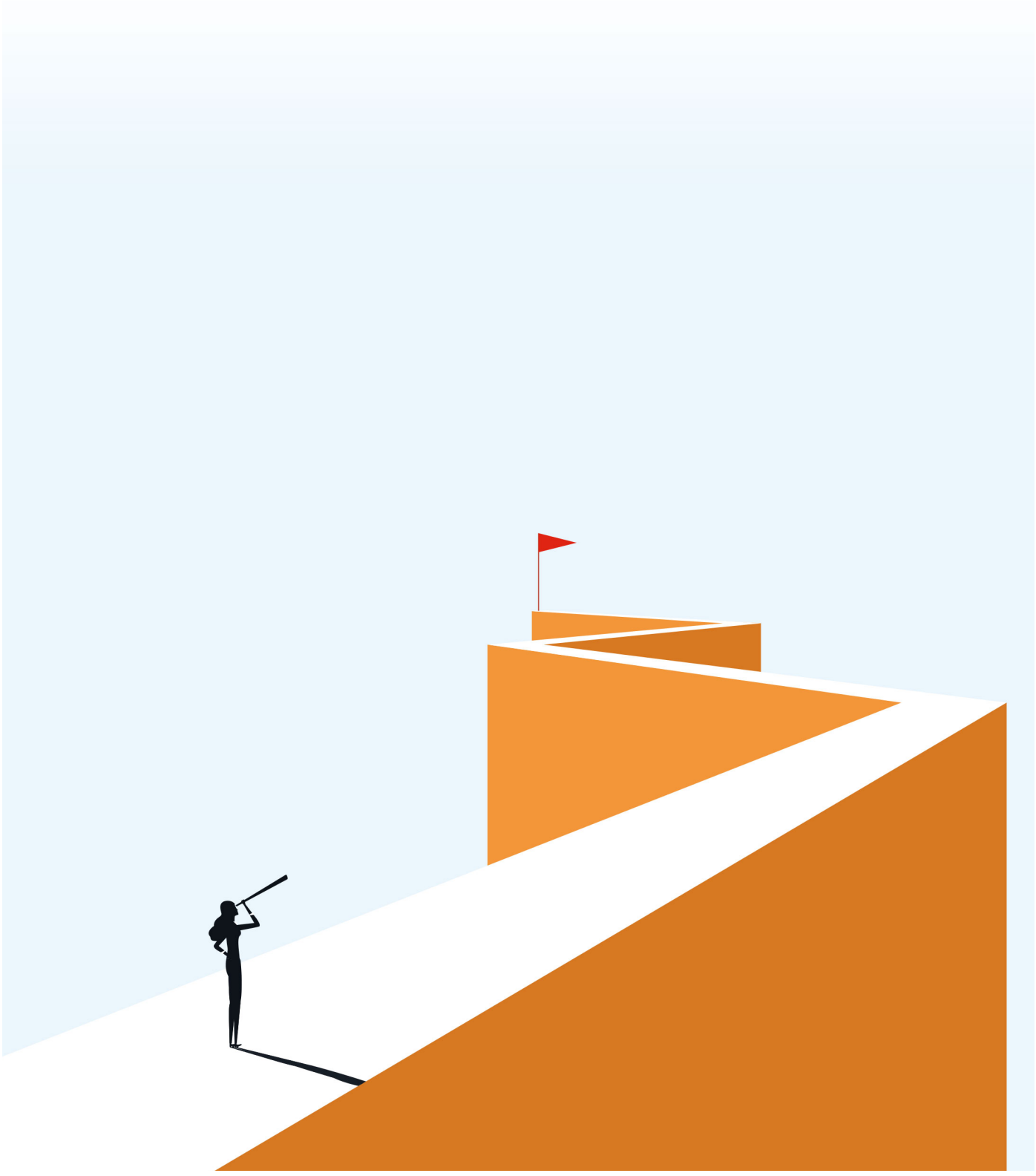
As concluded in the June and September 2023 Voice articles, there are not many positive comments to make about labour market conditions for Internationally Educated Graduates. Across the board (almost) far fewer proportions of IEGs work in their field of study and mainly earn far less than their inside Canada degree counterparts. The exception and bright spot are for those with math+ degrees working in their field. They even have a slightly higher percentage of working in the field than inside Canada degree holders. This is reflective of the high demand for high-tech skilled workers and bodes well for immigrants to Canada with those types of degrees and/or skills. Indeed, a higher proportion of IEG engineering graduates work in non-engineering STEM professions than in engineering.

All disciplines analyzed for this paper demonstrate high levels of underemployment, although a greater proportion of math+ and education degree holders work in their field of study than are underemployed. Engineering, business, and law IEG degree holders have especially high levels of underemployment. It would be interesting to look at medical doctors and nurses as well, but the census data reviewed does not distinguish between nursing and all other health disciplines, including physicians – they are all combined under one category.

It again is clear that immigrants in most all types of professions and skill sets face severe barriers in finding work in their field after moving to Canada. OSPE hopes to receive new funding in 2024 to provide job search training for IEGs, but there is no guarantee this will occur. In the meantime, OSPE encourages IEGs to become members and avail themselves to OSPE's career services and professional development open to all members.

How Do Salaries of Engineering Graduates Compare with Graduates from Other Disciplines?

Published in The Voice | June 2023



HOW DO SALARIES OF ENGINEERING GRADUATES COMPARE WITH GRADUATES FROM OTHER DISCIPLINES?

OSPE is often asked how engineering salaries compare with those of other professions. One indicator of this is to look at 2021 Census data about salaries of respective graduates from selected other professions - Math/Computer/Information Science (Math+), Business, Education, and Law. We particularly want to look at income of graduates in these fields who actually work in the profession associated with their degree. Conversely, it is also pertinent to look at the respective graduates who are underemployed, defined as jobs that do not necessarily require a university degree, to gain an understanding of how engineering degree holders working in these types of jobs compared to other underemployed degree holders. As well, location of where one obtained their degree offers insights on both those working in their field of study and who are underemployed.

This article builds upon other census observations conveyed in the June, September, and December 2023 Voice magazines. The analysis was limited to individuals who were employed at the time of the census and aged between 25 and 64 years. The census does not distinguish between licenced engineers or non-licenced engineering graduates nor certifications or credentials of other professions and thus all findings reported are based solely on individuals having a bachelor's degree or higher in engineering, math+, business, education, and law.

Key observations can be made from reviewing the charts in Figure 4.1 that convey weighted annual salaries of the respective disciplines analyzed in this article. The professions looked at show salaries of individuals having a degree in that discipline, including engineering. Age ranges are shown, and variables are broken down by location of degree and comparisons between those working in their field and those underemployed.

Key Observations:

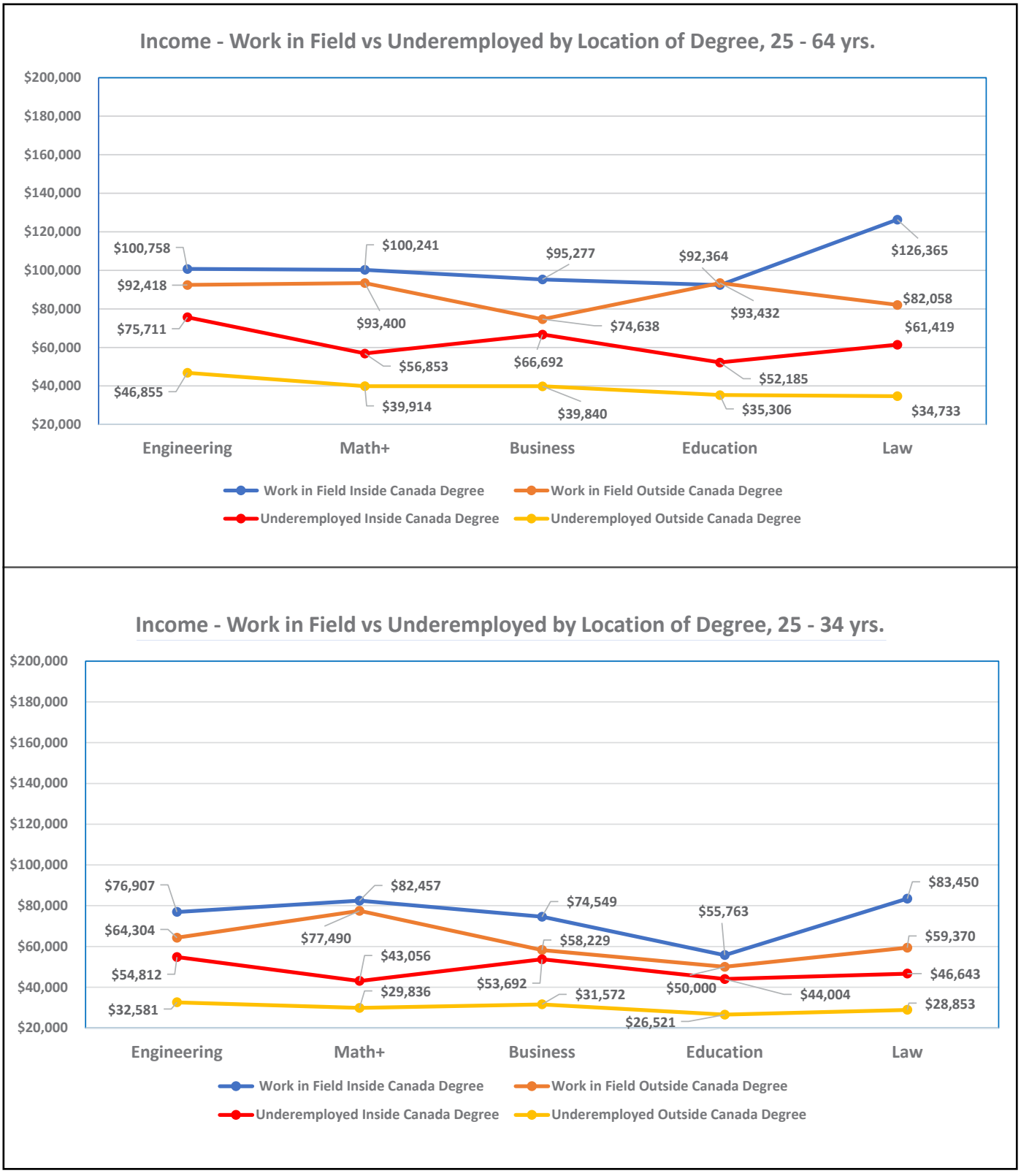
Working in field of study

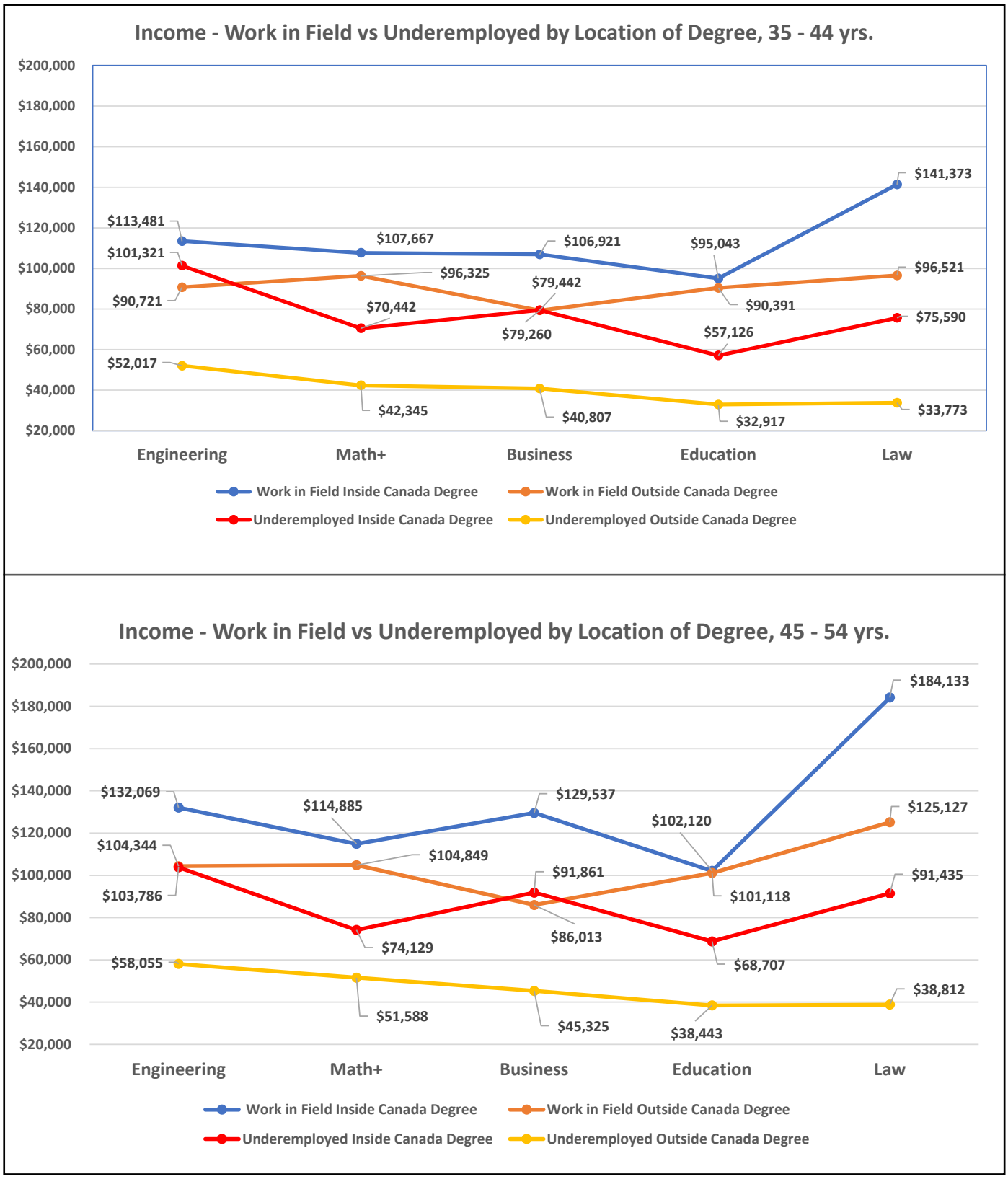
- Over the duration of their career (25 to 64 years old), engineering graduates make comparable (and high) incomes compared to those with Math+, Business, and Education degrees. For Engineering graduates in older age ranges (over 45), however, they have higher incomes than those other professions and for those 55 – 64, considerably higher incomes. This applies in general to both those with degrees from inside and outside Canada although Internationally Educated Graduates (IEGs) earn less than Canadian degree holders, except for Education graduates.
- Law graduates with degrees from inside Canada unsurprisingly earn significantly more than those with other degrees and those with degrees from outside Canada.
- The location of degree makes no difference for Education degree holders; this is no doubt because most are covered by collective agreements.
- IEGs with Math+ degrees make close to the same amount of money as Math+ degree holders from inside Canada.
- As workers get older, the disparity of incomes between inside and outside Canada degrees holders grows wider in Engineering, Business, and Law.

Underemployed

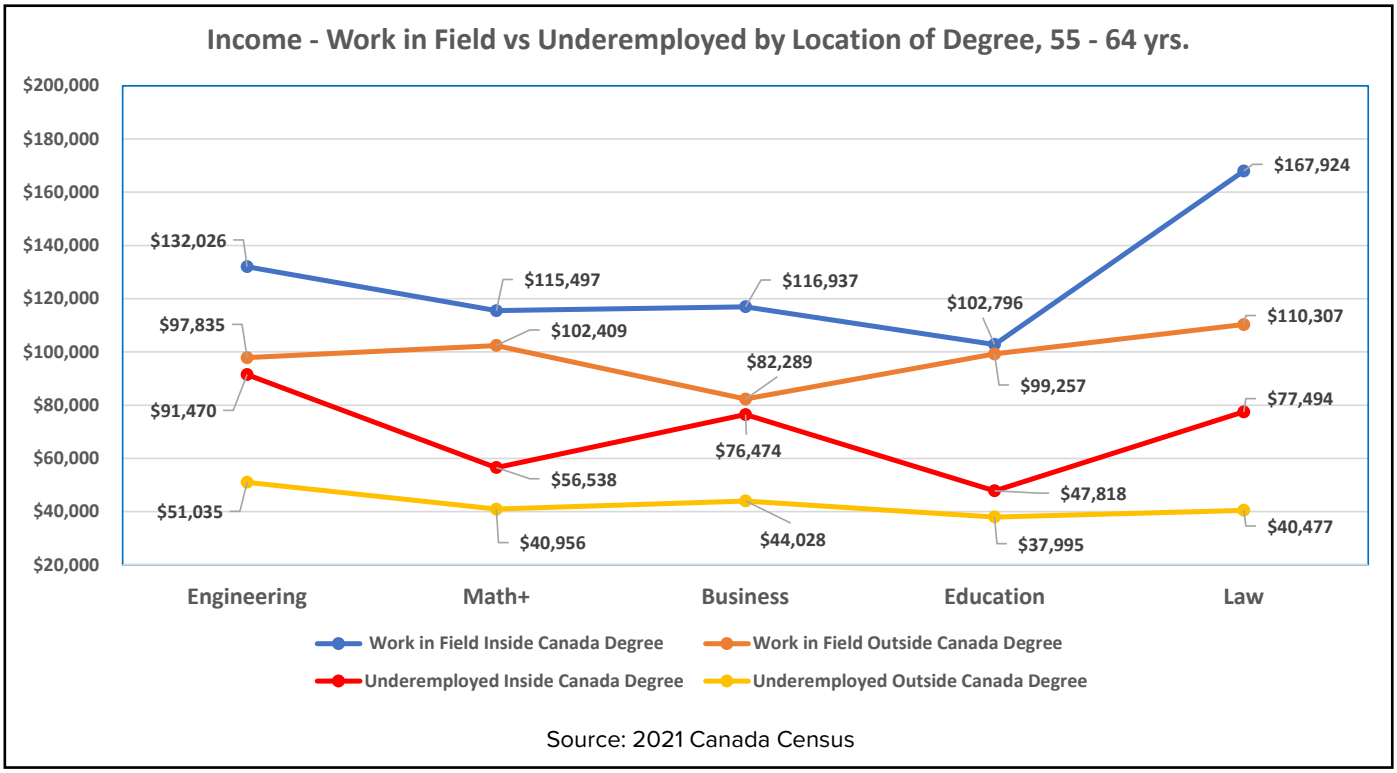
- Even though many Canadian educated Engineering graduates are, by definition, underemployed, they earn a higher income than all other Canadian educated underemployed graduates from the other disciplines covered in this article; this includes those with degrees in Law.
- By a wide margin, underemployed IEGs earn less than all other cohorts described in this analysis.
- Underemployed IEGs with Engineering degrees in general earn a bit more income than all other types of degree holders who are underemployed, including those with law degrees.
- In general, underemployed IEG Law degree holders earn the least or near least of all other degree holders.
- Income disparity in older age ranges is similar for those working in Engineering, Business, and Law; interestingly, those in the 45 and older age ranges working in Engineering as IEGs make the same or marginally more than underemployed inside Canada degree holders.

Figure 4.1: Annual Salaries of Degree Holders Working in their Field or Underemployed by Age Ranges and Location of Degree




Income - Work in Field vs Underemployed by Location of Degree, 35 - 44 yrs.
$200,000
$180,000
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$113,481
$107,667
$106,921
$95,043
$141,373
$101,321
$96,325
$79,442
$96,521
$90,721
$70,442
$90,391
$79,260
$57,126
$75,590
$52,017
$42,345
$40,807
$32,917
$33,773
Engineering
Math+
Business
Education
Law
Work in Field Inside Canada Degree
Work in Field Outside Canada Degree
Underemployed Inside Canada Degree
Underemployed Outside Canada Degree

Income - Work in Field vs Underemployed by Location of Degree, 45 - 54 yrs.
$200,000
$180,000
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$132,069
$114,885
$129,537
$102,120
$184,133
$104,344
$104,849
$91,861
$125,127
$103,786
$74,129
$86,013
$101,118
$68,707
$91,435
$58,055
$51,588
$45,325
$38,443
$38,812
Engineering
Math+
Business
Education
Law
Work in Field Inside Canada Degree
Work in Field Outside Canada Degree
Underemployed Inside Canada Degree
Underemployed Outside Canada Degree



Source: 2021 Canada Census

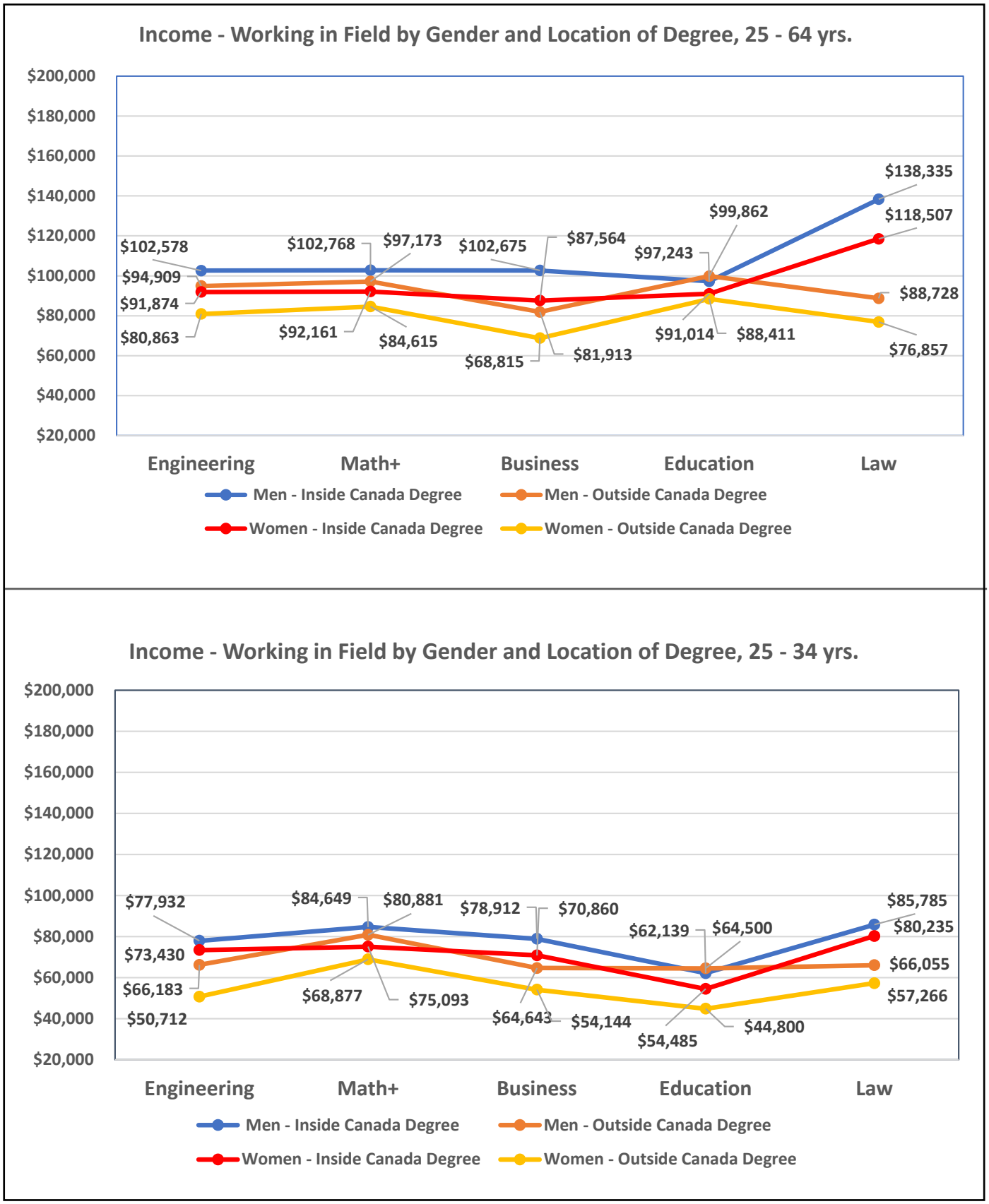
HOW DO INCOMES OF ENGINEERING GRADUATES COMPARE WITH OTHER PROFESSIONS BY LOCATION OF DEGREE AND GENDER – WORKING IN THEIR FIELD?

There is ample evidence that IEGs earn less than Canadian degree holders in all disciplines covered in this article. Evidence has also been presented in prior Voice articles that women with engineering degrees earn less than their men counterparts, albeit the gaps for those working in engineering are narrowing. How do women with degrees in other disciplines fare, then, compared to engineering degree holders? This section covers income by gender and location of degree. These are graphically displayed in Figure 4.2.

Key Observations:

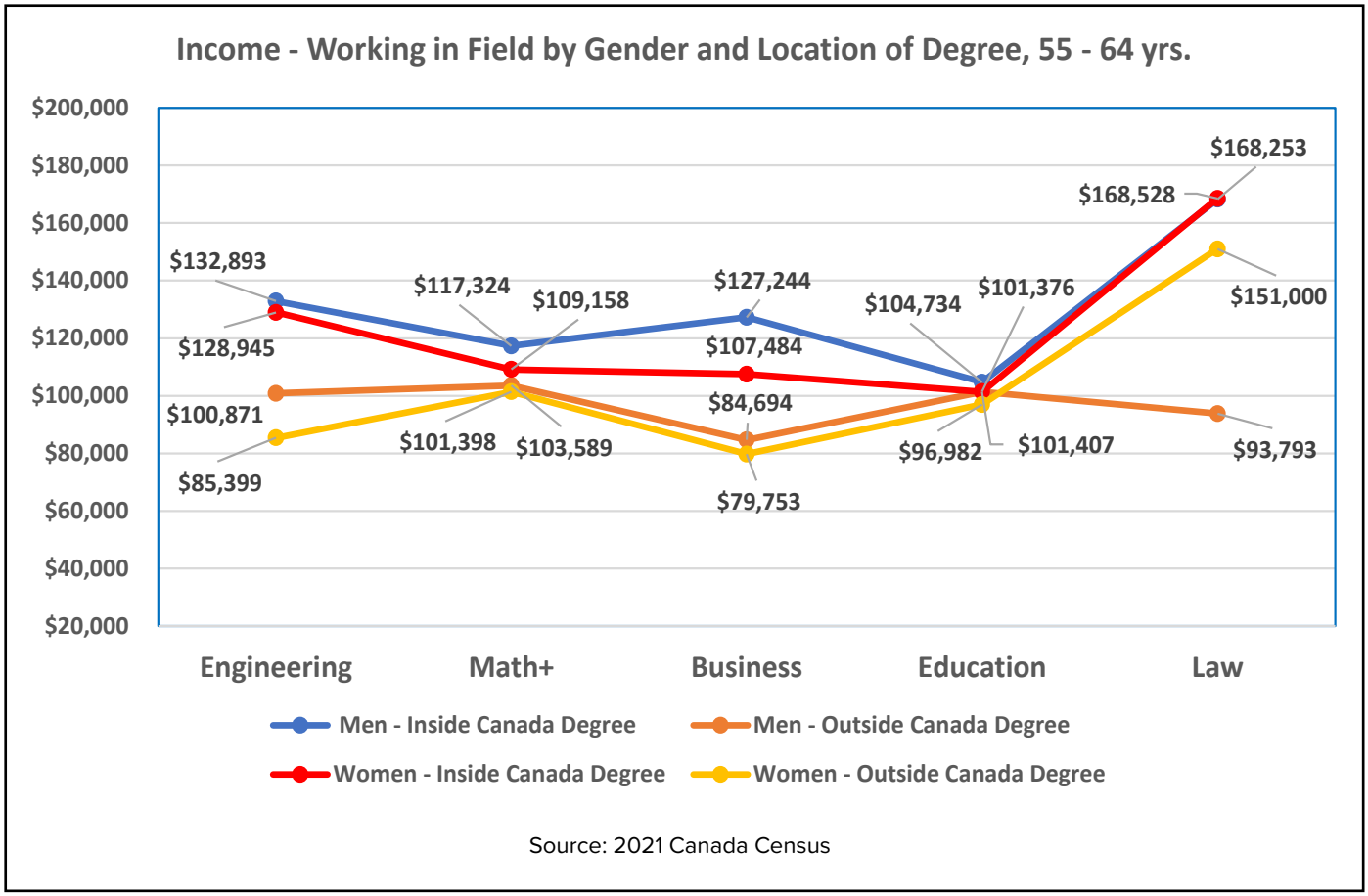
- Over the duration of their career (25 – 64 years old), income gaps between men and women are narrowest in Education (collective agreements), Math+, and, which is a positive sign, Engineering. Law by far has the widest gaps in income, although in specific age ranges which are described below, the gaps are much narrower.
- When broken down in separate age ranges, the weighted income of IEG men is in general lower than Canadian educated women.
- IEG women earn the least in all professions and all age ranges.
- Law graduates unsurprisingly make the most money, although IEGs of both genders do not necessarily make more than IEGs in other professions.
- Income of Canadian educated men and women Law graduates in the oldest age range of 55 – 64 are virtually on par.
- For separate age ranges over 35 years old, wage gaps are progressively wider in Engineering, Business, and Law between Canadian and non-Canadian degree holders.
- For ages older than 35, wage gaps between Canadian educated men and women become wider for Math+ and especially Business.
- Canadian educated men and women over 55 years old in Engineering have the highest income of any profession, except, of course, those in Law.

Figure 4.2: Annual Salaries of Degree Holders Working in their Field by Age Ranges, Location of Degree, and Gender




Income - Working in Field by Gender and Location of Degree, 35 - 44 yrs.
$200,000
$180,000
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$114,803
$105,057
$93,450
$83,492
$110,750
$99,255
$85,857
$100,044
$117,880
$97,791
$71,041
$87,939
$97,738
$93,819
$86,295
$95,894
$152,325
$132,622
$112,687
$83,816
Engineering
Math+
Business
Education
Law
Men - Inside Canada Degree
Men - Outside Canada Degree
Women - Inside Canada Degree
Women - Outside Canada Degree

Income - Working in Field by Gender and Location of Degree, 45 - 54 yrs.
$200,000
$180,000
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$133,070
$123,743
$105,595
$89,012
$118,934
$105,462
$107,497
$99,292
$138,519
$114,151
$90,173
$81,795
$103,579
$101,655
$97,964
$103,005
$192,600
$177,936
$142,136
$107,530
Engineering
Math+
Business
Education
Law
Men - Inside Canada Degree
Men - Outside Canada Degree
Women - Inside Canada Degree
Women - Outside Canada Degree



Source: 2021 Canada Census

FINAL THOUGHTS

As demonstrated in the June, September, and December 2023 Voice articles about the 2021 Census,, in terms of income and type of job, Canadian educated graduates, especially men, are doing quite well in their careers if working in their field of study. For engineering graduates, this is especially true when working in their field as well as other professions. Even if underemployed, Canadian educated engineering graduates do well, assuming earning over $100,000 a year is deemed doing well.

It appears that income parity between men and women is becoming more a reality in some professions and in older age groups. This, of course, primarily applies to those Canadian educated. Parity is evident in IEGs as well in older age ranges although income for both IEG men and women remains lower than Canadian educated, except in jobs covered by collective agreements (Education).

What is abundantly clear is that women IEGs are struggling as they obviously face barriers in earning power, even if working in their field and especially if underemployed. Except for a few professions like Math+ and Education, IEG men also earn less than Canadian educated counterparts.

Going forward, OSPE will continue to advocate for pay parity between genders and higher pay for IEGs. OSPE will continue to encourage more young people, and especially those from underrepresented groups, to pursue engineering as a career. OSPE will continue to advocate to the provincial and federal governments to provide more funding and bridging programs to help IEGs integrate into the Canadian economy and obtain gainful employment. OSPE will continue to provide career services including regular Engineering Employment Events (E3s). Most importantly, OSPE will continue to raise the profile of all engineers and provide meaningful services and benefits for its members.