

POPULATION NB

# Postsecondary Enrolments and Graduate Outcomes



PREPARED BY

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At first glance

# OVERVIEW

## Purpose

Investing in postsecondary educational development may be an investment into New Brunswick's future, especially considering the province's impending labour market gap. As students graduate, they bring a diverse range of skill sets to the workforce. The objective of this report is to evaluate how postsecondary enrolments, graduates in different fields, and graduate employment income are evolving in New Brunswick (NB) according to gender, age group, and student status. This analysis provides knowledge of which field enrolments may be targeted, and income disparities that may be restricting growth, which can be used to inform the implementation of policies for training and education.

## Major Points

- Postsecondary graduate numbers in NB are about 2.5 times lower than enrolment numbers.
- Enrolments and graduates in non-STEM fields, including health and related fields, have been decreasing between 2013 and 2017.
- Graduate numbers in STEM have been relatively consistent; however, mathematics and computer science graduates have increased. New Brunswick has a higher proportion (30%) of STEM graduates than Canada (23%).
- There are more female graduates than male graduates in non-STEM fields while the proportion of male graduates is higher in STEM fields.
- International students comprise a large percentage of graduates in multiple non-STEM and STEM fields. Compared to Canadian students, they make up 22% of business, management and public administration graduates, 17% of education graduates, and 36% of graduates in mathematics and computer and information sciences.
- Median employment income increased between two and five years after graduation for 2012 graduate cohorts in all fields. For undergraduate graduates, those in architecture and engineering, math and computer sciences, and health and related fields have the highest median income, which is above \$70,000. Income also increased with higher educational qualifications.
- Median employment income in all fields is higher for males than females five years after graduation. Five years after graduating from undergraduate and master's programs, males made 19% and 8% higher median income, respectively, for all reported fields.
- International students have ~6% lower income in business fields five years after graduation.



## Immigrant Income & Employment

# INTRODUCTION

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From 2018 to 2027, New Brunswick is projected to have 120,000 job openings across the province. Yet, 13,000 of those cannot be filled by local labour alone. Targeting postsecondary enrolments may be part of the solution for addressing an impending labour market gap. Evaluating the changes in enrolment in STEM and non-STEM fields can help inform progress towards the implementation of informed policies around training and education to support growth and identify where future skill shortages may lie. And analysis of graduate employment income can illustrate the income discrepancies of minority groups.

Education serves as a vehicle for social and economic progress. The objective of this report is to evaluate how postsecondary enrolments in different fields, along with graduate employment income, are evolving in New Brunswick according to gender, age group, and student status, with concerns over an impending labour market shortage and increasing youth outmigration. Using Statistics Canada data, this report evaluates changes in enrolment numbers between 2013 and 2017 according to STEM (Science, Technology, Engineering and Math) and Non-STEM fields, and it compares results between

- the Atlantic Provinces and New Brunswick,
- males versus females, and
- international students versus Canadian students.

This report also evaluates 2012 graduate income in 2017 constant dollars two and five years after graduation (according to field, educational qualification, gender, age, and student status) using available Statistics Canada data for graduates who reported income.

Postsecondary educational enrichment may be of long-term benefit to the province of New Brunswick. There are several target occupations in the province that will require skilled workers to fill vacant positions in the future and which are essential to the socioeconomic growth of the province. There may also be a need for additional job openings for NB's more educated residents. Truck driving roles are in very high demand, and alongside this fall many other business and health opportunities.

Students may be better supported in their success after graduation with provision of more hands-on learning throughout their educational path. This also entails equity between male and female graduation outcomes, as well as providing opportunities for international students so in the future they also have incentives to contribute to the provincial labour market.

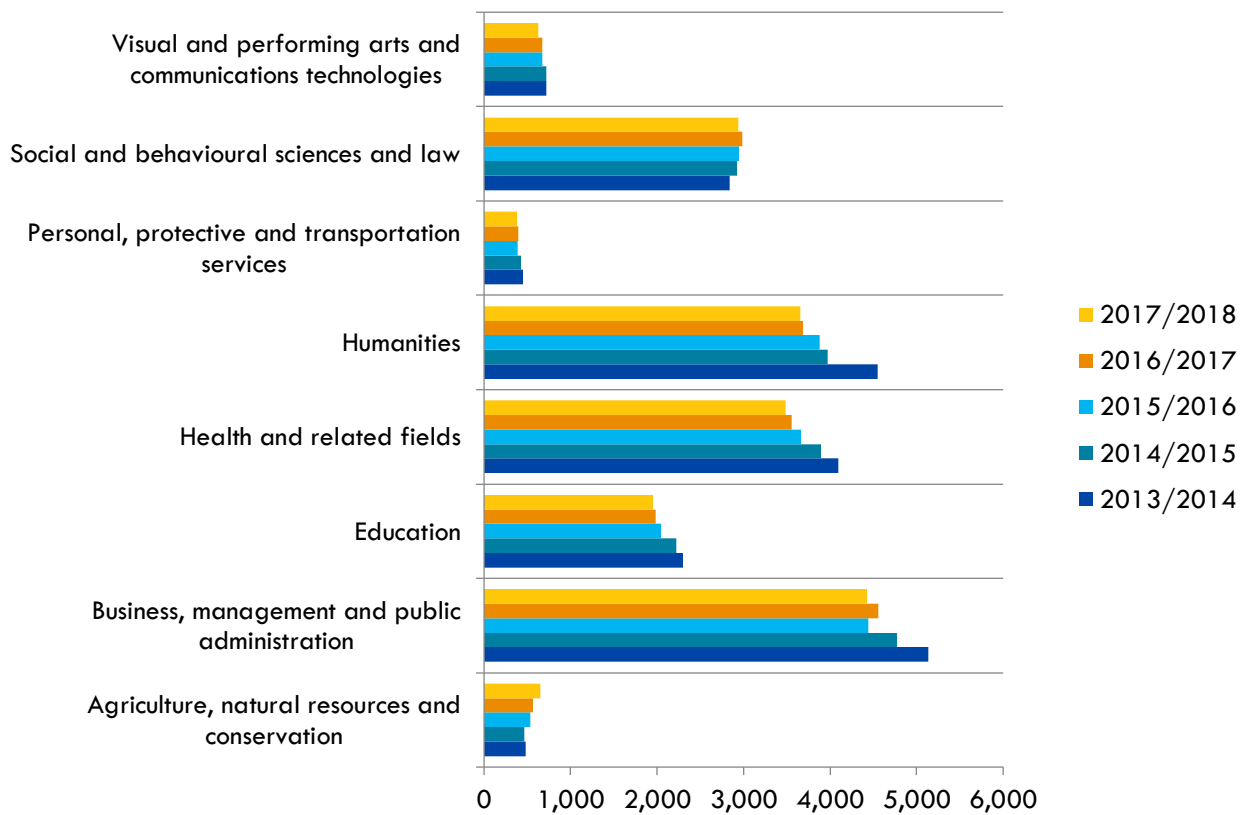


## Key findings

# RESULTS

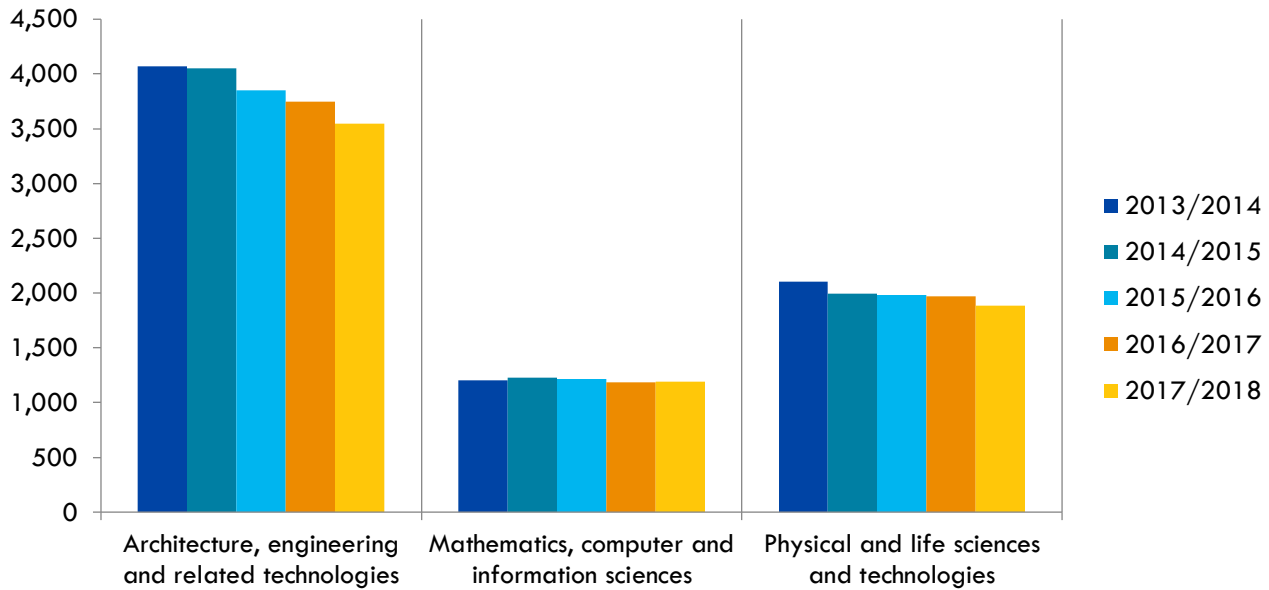
### Enrolments and Graduates

Figure 1: Number of New Brunswick Postsecondary Enrolments in Non-STEM Fields from 2013 to 2018



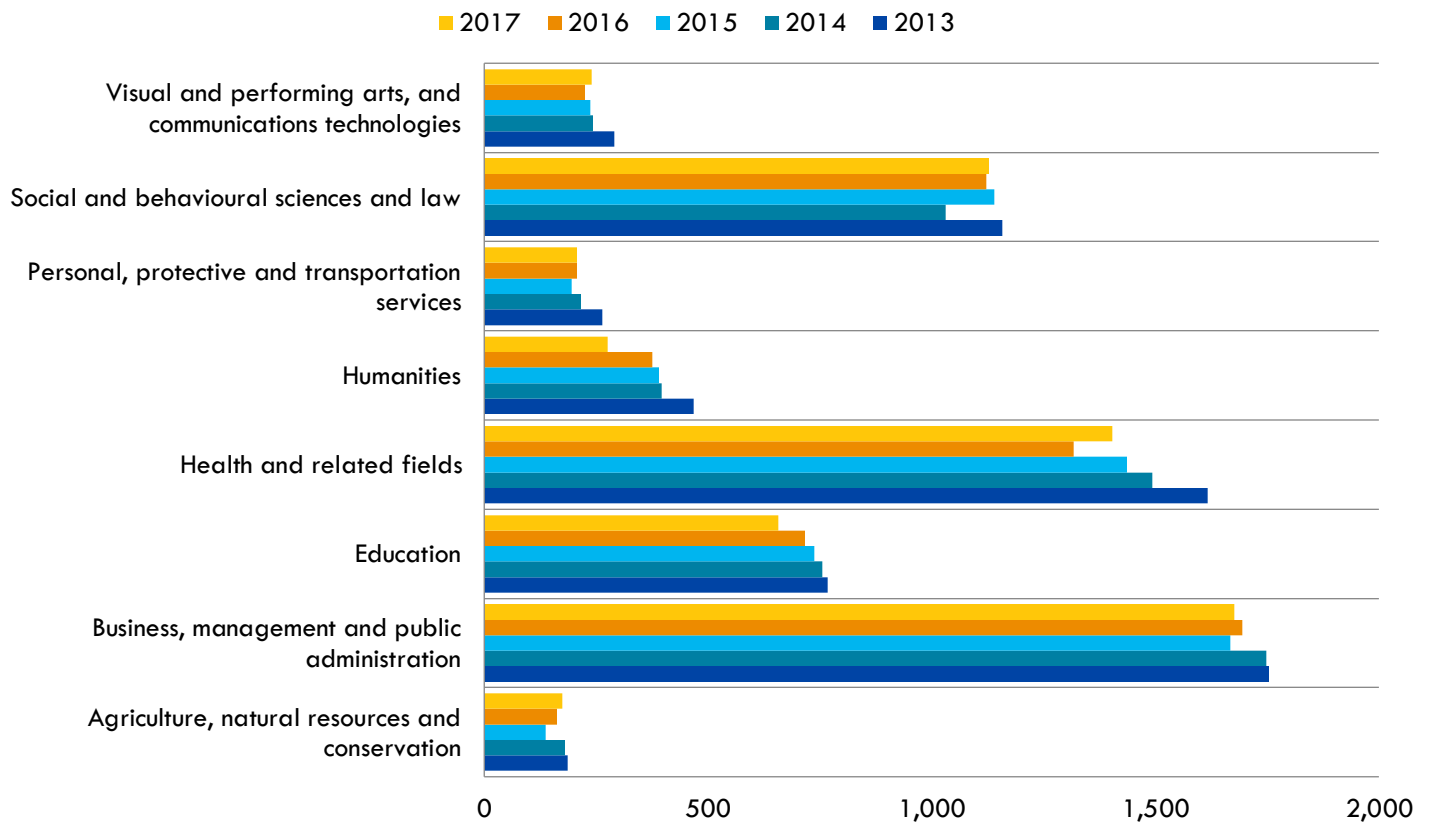
Aside from enrolments in agriculture and social sciences and law fields, enrolments in non-STEM fields decreased between 2013 and 2018. Over this time period, business fields had 711 fewer enrolments, humanities had 894 fewer enrolments, and health fields had 612 fewer enrolments.

Figure 2: Number of New Brunswick Postsecondary Enrolments in STEM Fields from 2013 to 2018



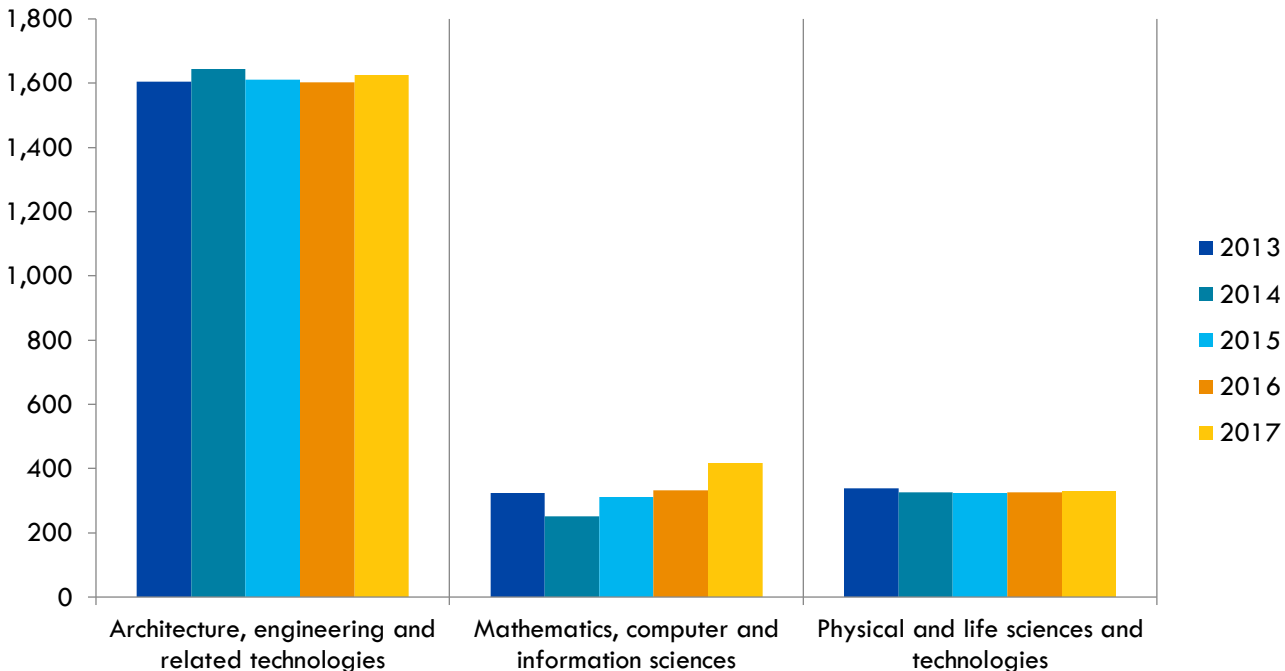
Enrolments in STEM fields also decreased from 2013 to 2018. Over this time, architecture and engineering fields had 519 fewer enrolments, and physical and life sciences had 216 fewer enrolments.

Figure 3: Number of NB Postsecondary Graduates in Non-STEM Fields from 2013 to 2017



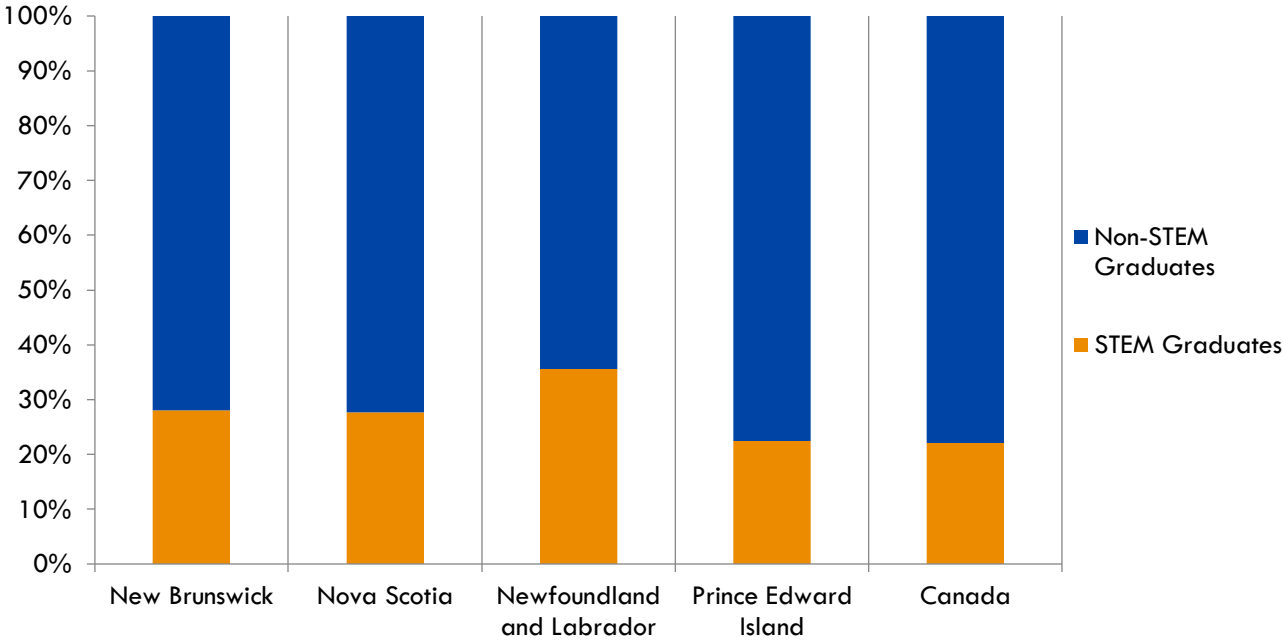
New Brunswick postsecondary graduate numbers in non-STEM fields were lower in 2017 compared to 2013. Of these fields, the highest graduate numbers were in business, management and public administration, followed by health and related fields, and then social and behavioural sciences and law. The largest loss was in health and related fields, which had 213 fewer student graduates in 2017 compared to 2013.

Figure 4: Number of NB Postsecondary Graduates in STEM Fields from 2013 to 2017



Graduate numbers in STEM fields were relatively stable between 2013 and 2017. Most graduates in STEM were from architecture, engineering and related technologies fields. Mathematics, computer and information sciences had the highest increase of graduates, with 93 more students in 2017 compared to 2013.

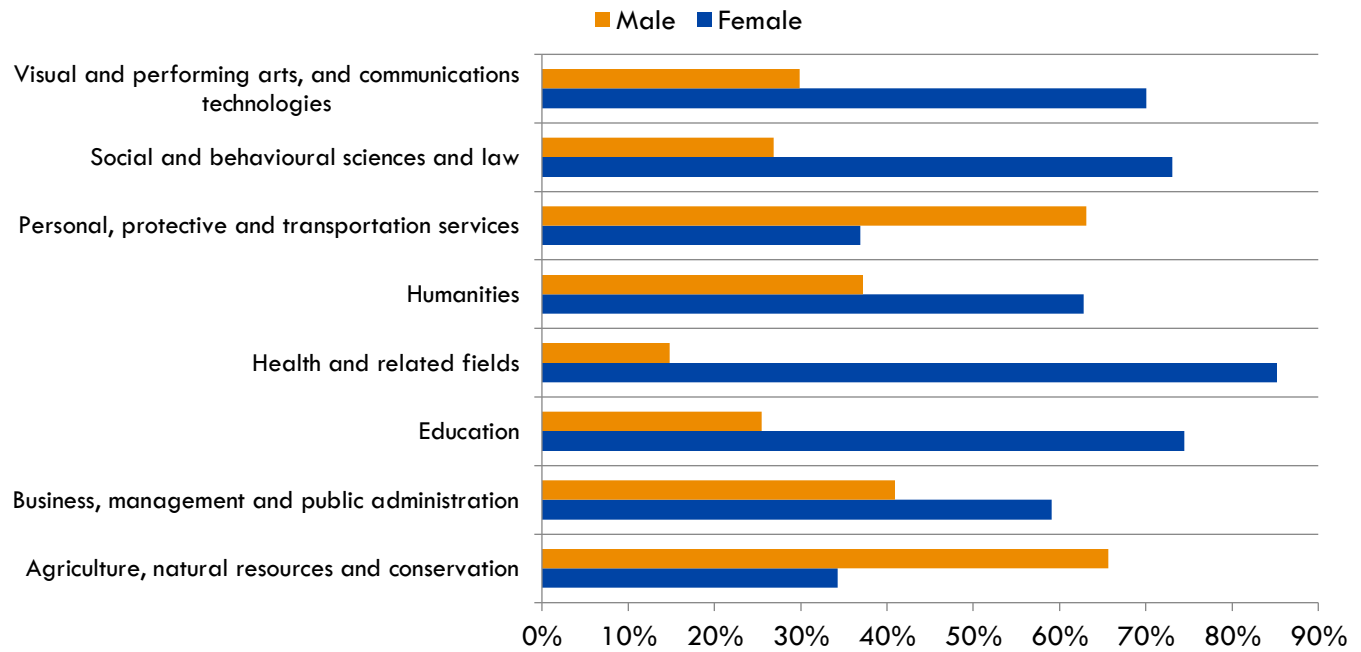
Figure 5: Percentage of STEM versus Non-STEM Postsecondary Graduates in Atlantic Provinces in 2017



As seen in Figure 3, around 30% of New Brunswick postsecondary graduates have STEM backgrounds. Nova Scotia has similar values, while Newfoundland and Labrador have more STEM graduates. Both Prince Edward Island and Canada as a whole have lower numbers of STEM graduates compared to New Brunswick.

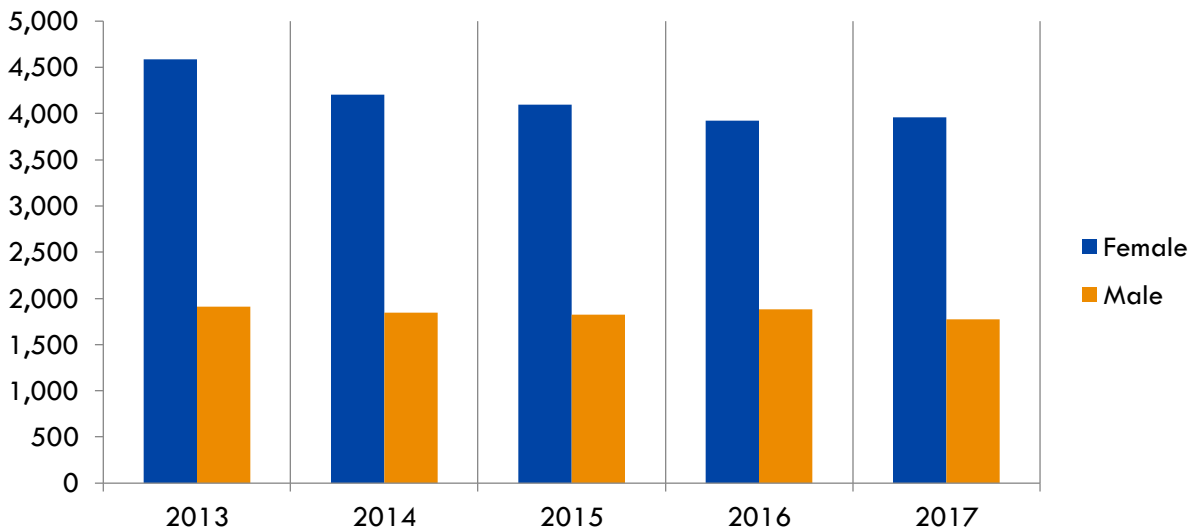
## Postsecondary Graduates by Gender

Figure 6: Percentage of Male Versus Female NB Postsecondary Graduates in Non-STEM Fields in 2017



Aside from personal, protective and transportation services, and agricultural, natural resources and conservation fields, non-STEM fields are dominated by female graduates.

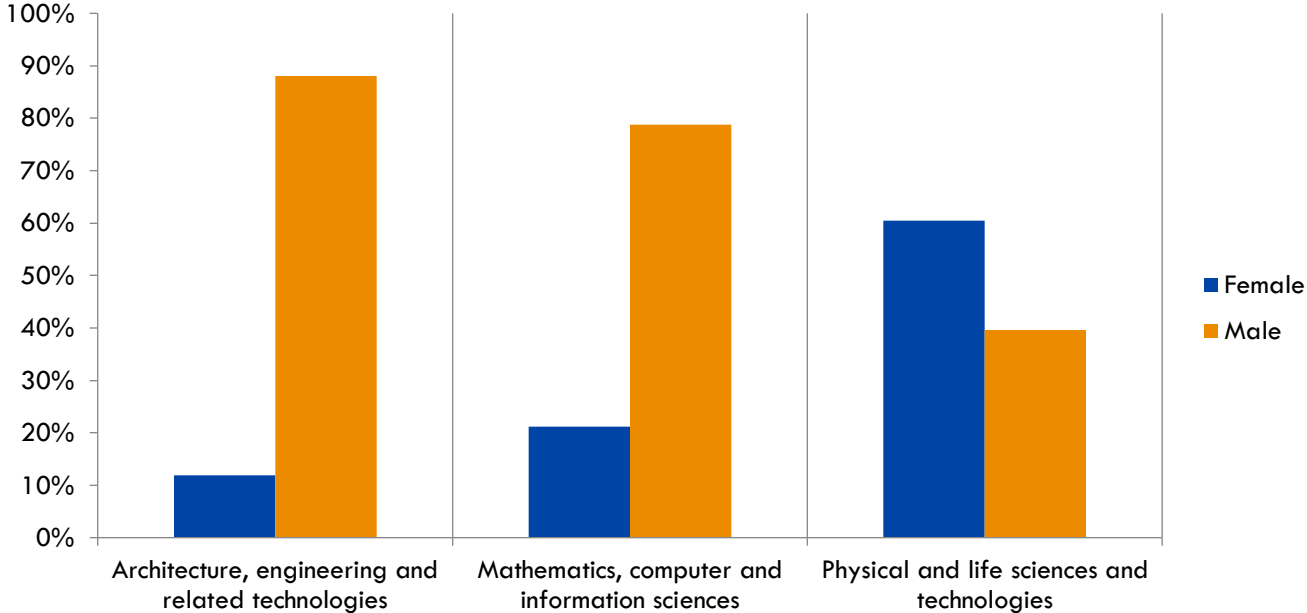
Figure 7: Male Versus Female NB Postsecondary Graduates in all Non-STEM Fields from 2013 to 2017





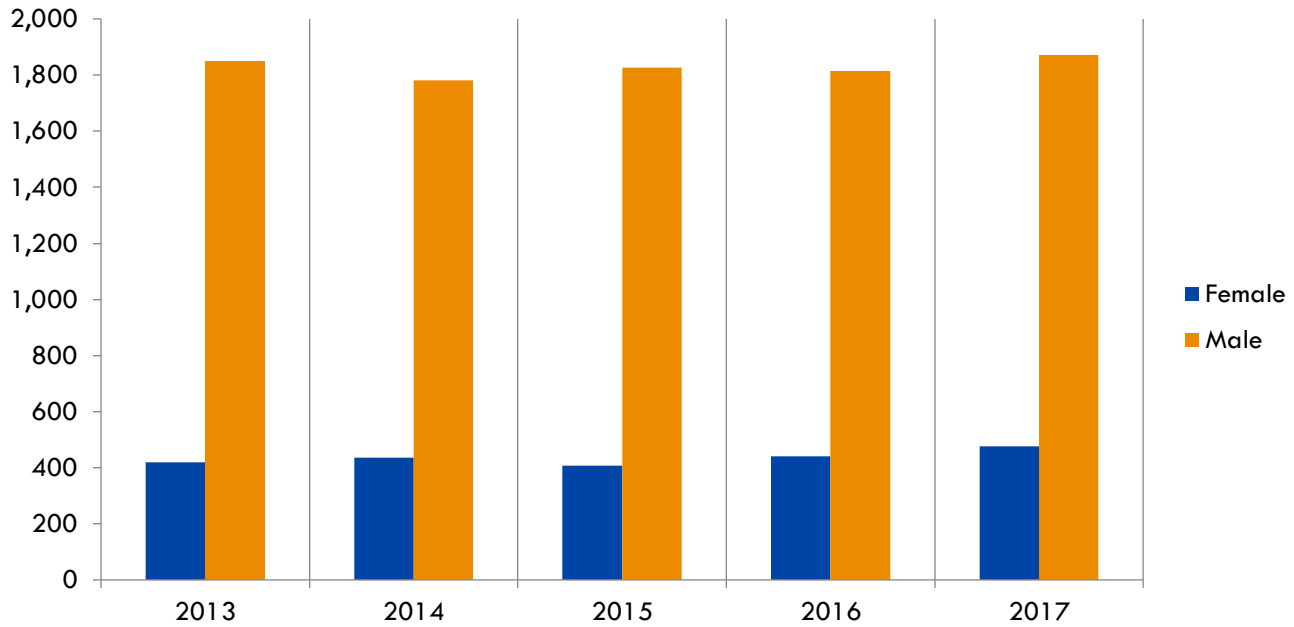
Although graduate numbers decreased between 2013 and 2017, the gap between male and female graduates in non-STEM fields remained relatively consistent. In 2017, there were 2,190 more female than male graduates in non-STEM fields, and 69% of enrolments were female.

Figure 8: Percentage of Male Versus Female NB Postsecondary Graduates in STEM Fields in 2017



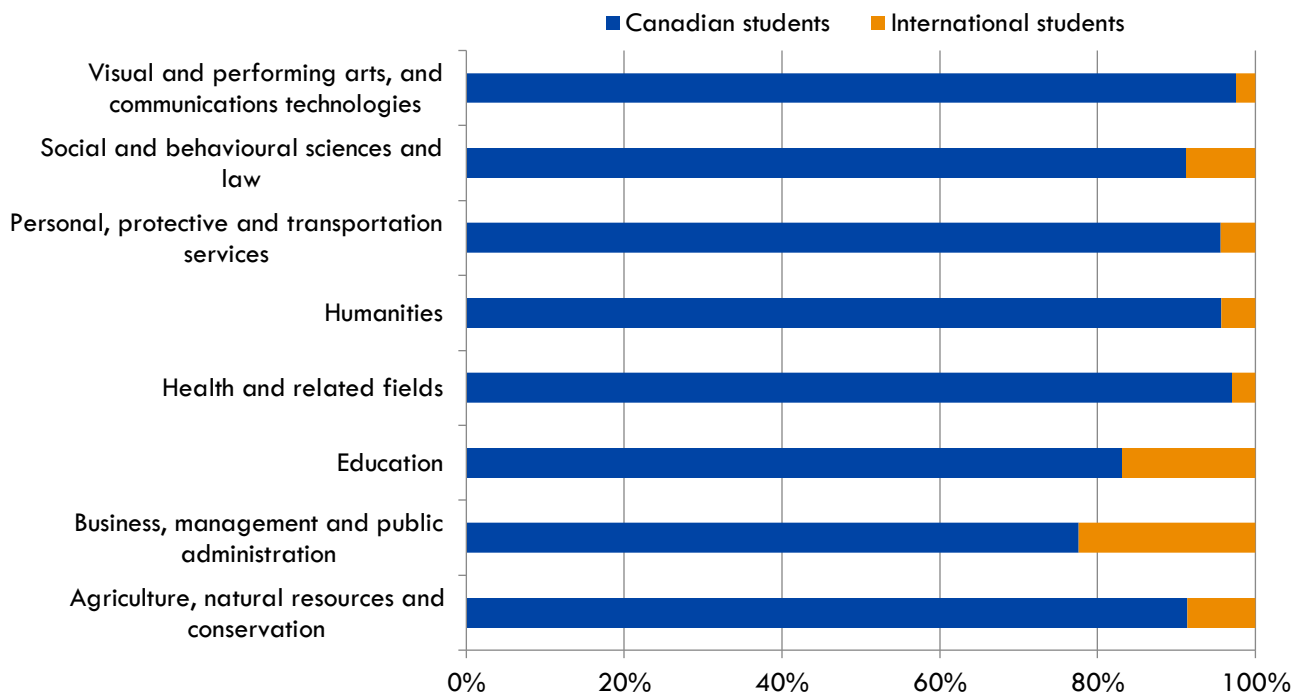
In 2017, male students made up 88% of graduates in architecture, engineering and related technologies, and 79% of graduates in mathematics, computer and information sciences. Female students made up 60% of the graduates in physical and life sciences and technologies.

Figure 9: Male Versus Female NB Postsecondary Graduate Numbers in All STEM Fields from 2013 to 2017



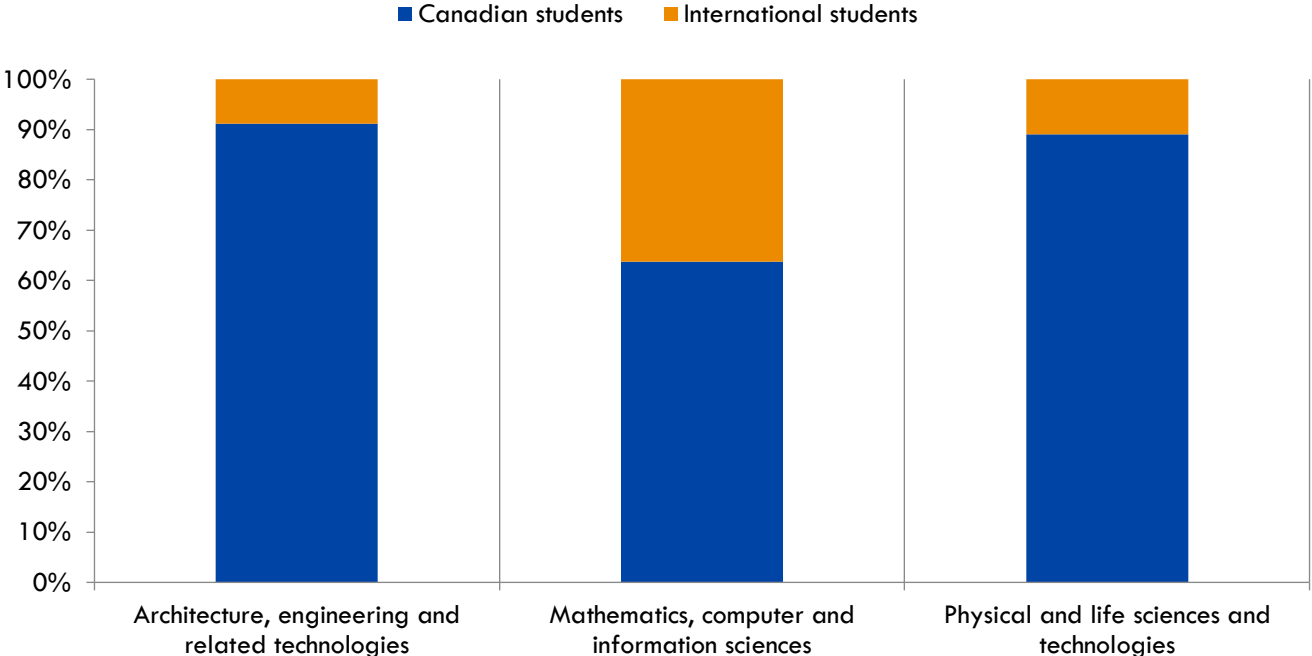
The gap between male and female graduates in STEM fields remained relatively large between 2013 and 2017. In 2017, there were 1,395 more male than female students in STEM fields, and 80% of STEM graduates were male.

Figure 10: Percentage of International versus Canadian Postsecondary Graduates in Non-STEM Fields in NB (2017)



As seen in the comparison of graduates in non-STEM subjects in Figure 10, international students make up 22% of graduates in business, management and public administration, and 17% of education graduates, with Canadian students making up 78% and 83% of graduates in these fields, respectively.

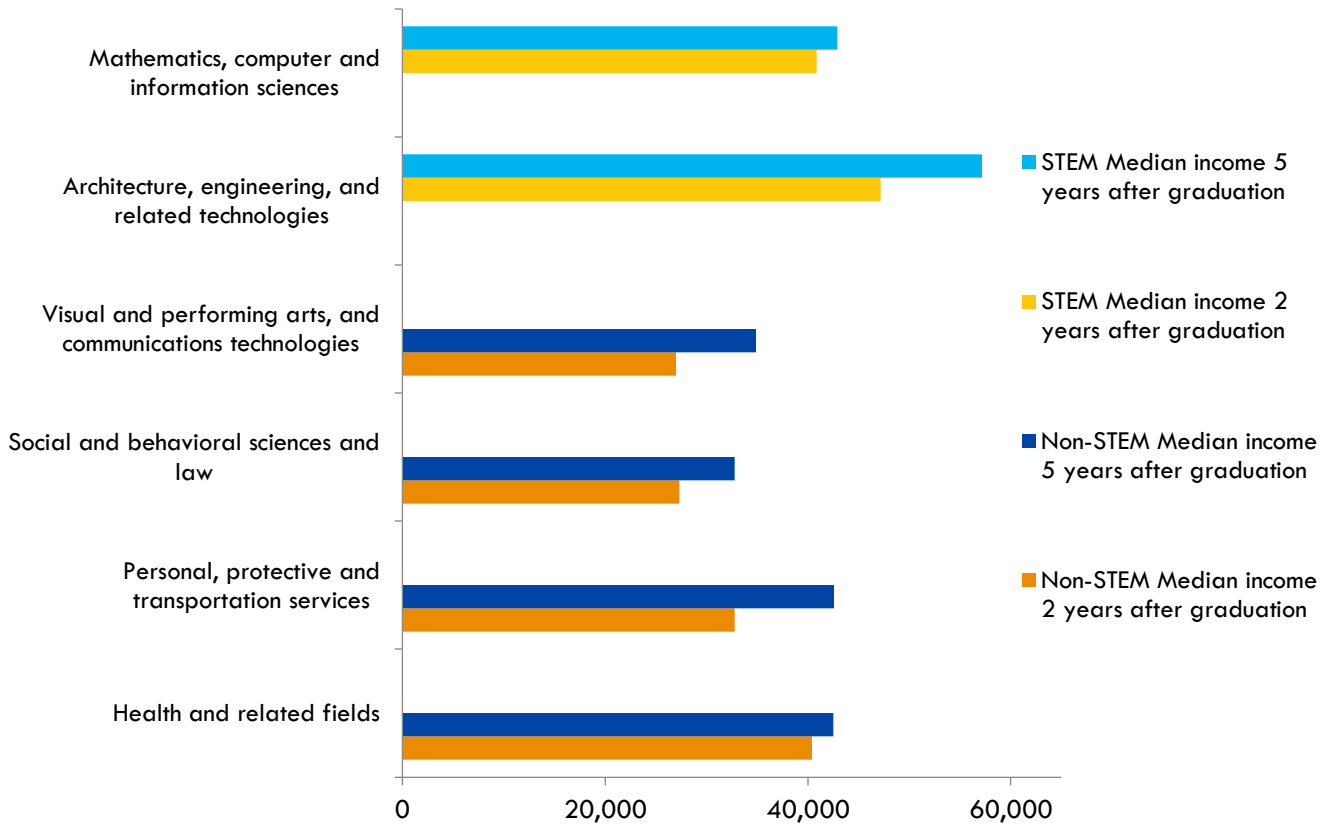
Figure 11: Percentage of International versus Canadian Postsecondary Graduates in STEM Fields in NB (2017)



International versus Canadian student graduate comparisons in STEM fields show that international students compose about 35% of graduates in mathematics, computer and information sciences.

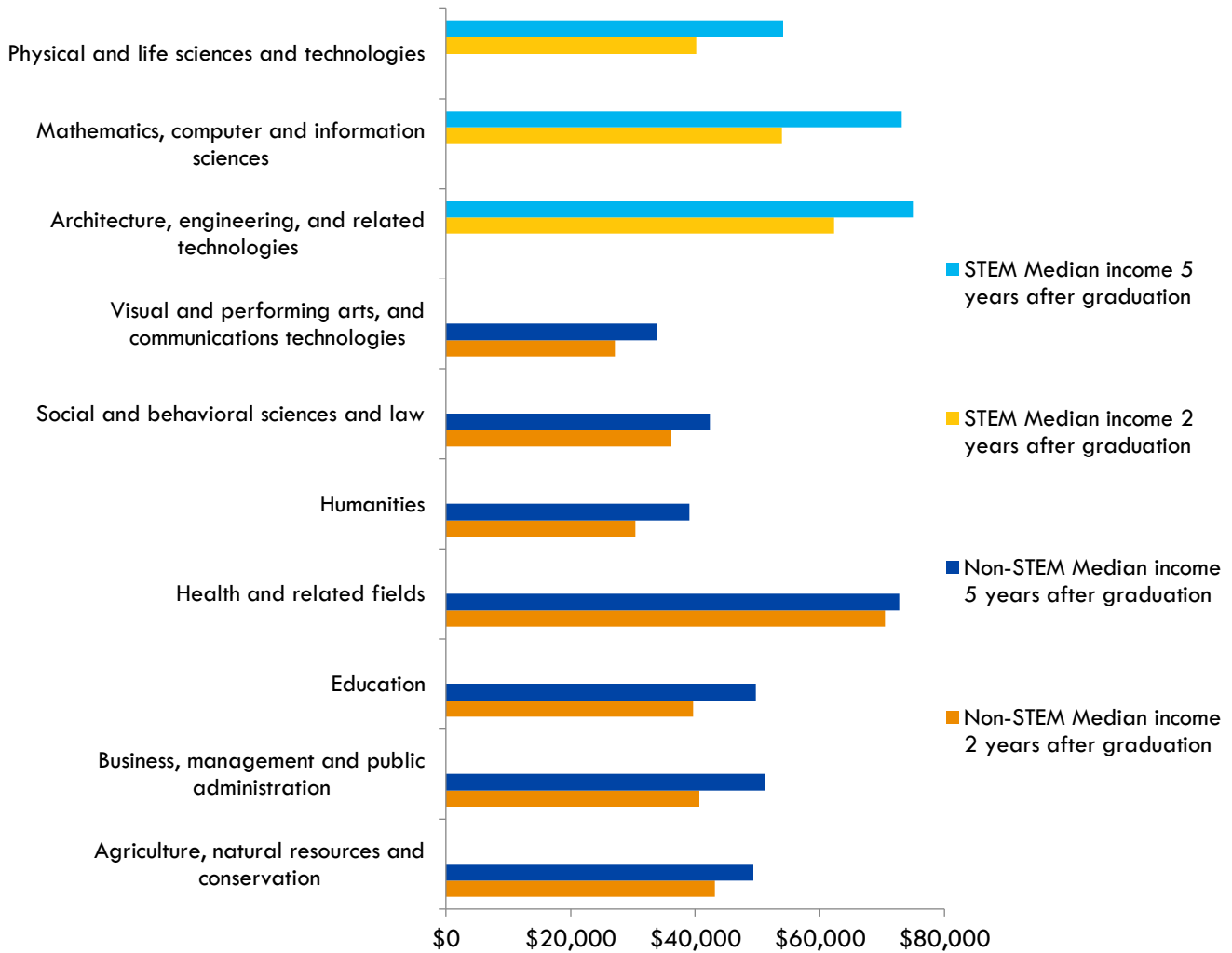
## Graduate Income

Figure 12: Median Employment Income of 2012 NB Graduates in Career, Technical or Professional Training Diplomas Two and Five Years After Graduation (2017 Constant Dollars)



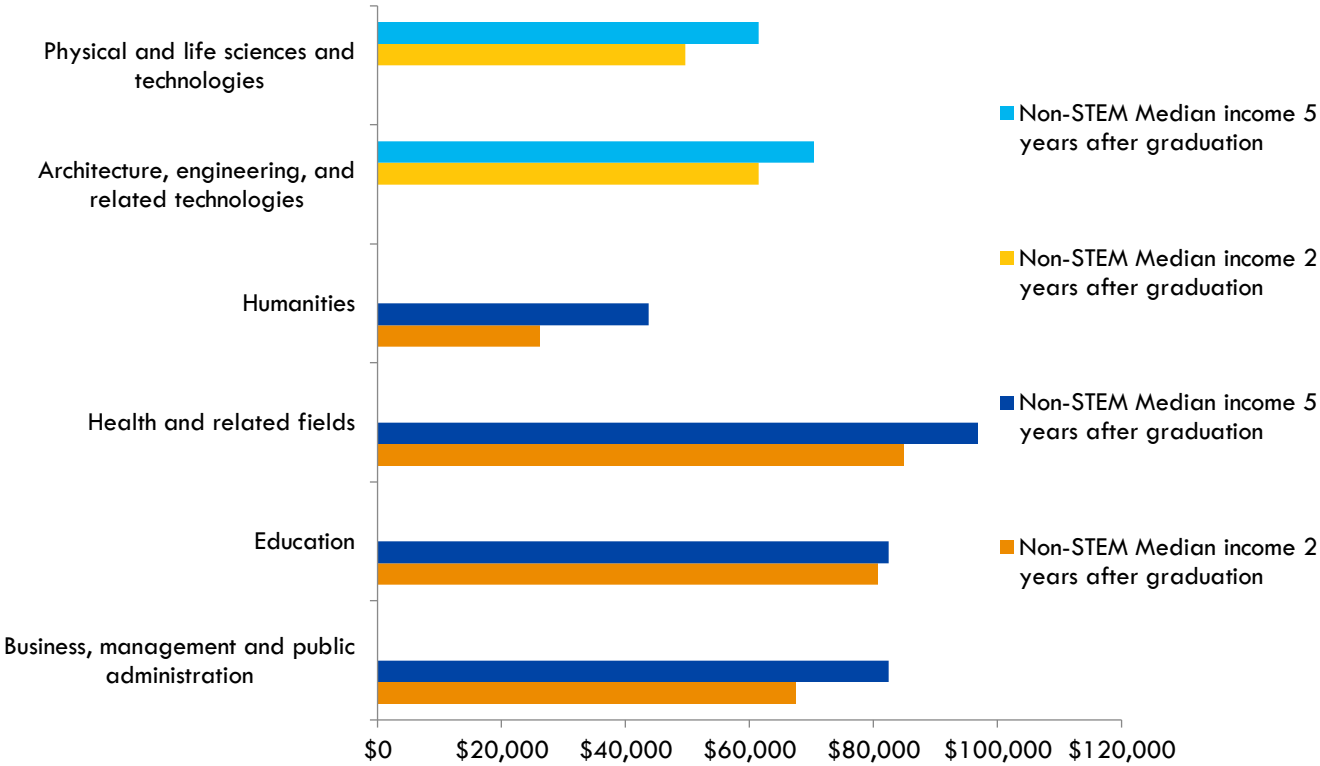
Between the two- and five-year mark, 2012 graduates with Career, Technical or Professional Training diplomas saw an increase in reported median income for all fields. Architecture, engineering and related technologies graduates had the highest median income, which was about \$57,000 five years after graduation. This field, along with personal, protective and transportation services, had the highest increase in income (~\$10,000) between two and five years after graduation.

Figure 13: Median Employment Income of 2012 NB Graduates Two and Five Years After Undergraduate Graduation (Bachelor's Degree) (2017 Constant Dollars)



The median employment income for 2012 undergraduate degree holders increased between two and five years after graduation and was higher for those with STEM degrees. Graduates in architecture and engineering, math and computer sciences, and health and related fields had the highest median income, which was above \$70,000. Math and computer sciences graduates also had the highest increase in median income, while health fields had the lowest increase.

Figure 14: Median Employment Income of 2012 NB Graduates Two and Five Years After Master's Graduation (2017 Constant Dollars)



For master's graduates, the highest median income was reported for health and related fields, followed by business-related fields and education. Five years after graduation, humanities and business graduates had the highest increase in income, while education graduates had the lowest.

Figure 15: Median Employment Income of 2012 NB Graduates by Educational Qualification for All Fields with Reported Income (2017 Constant Dollars)

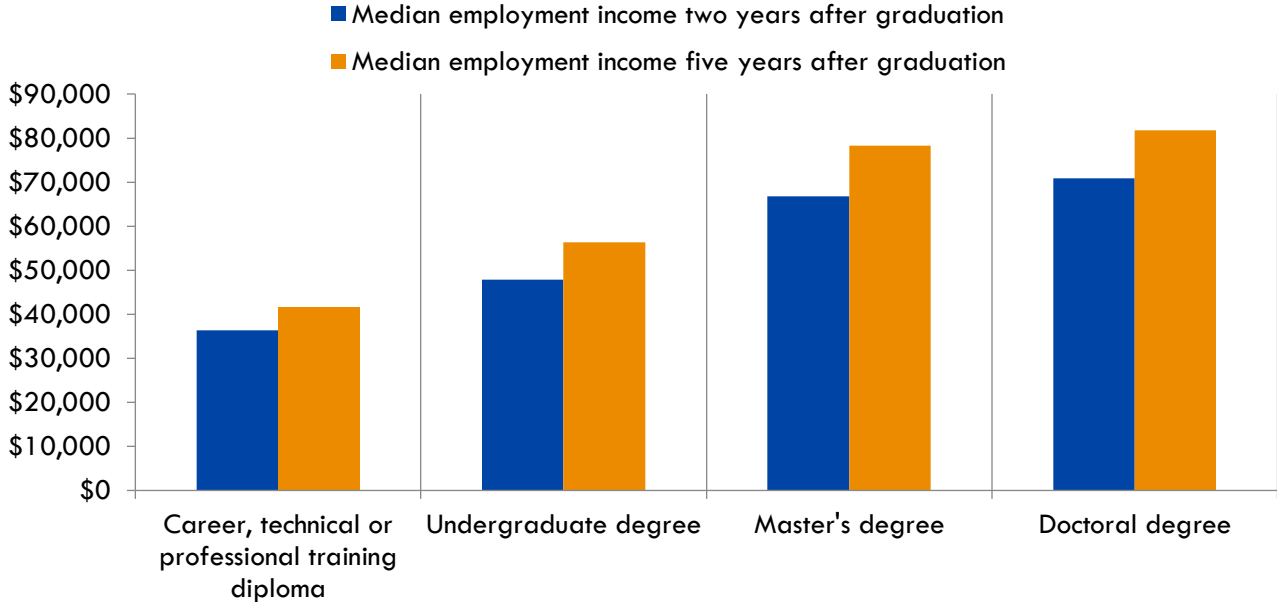
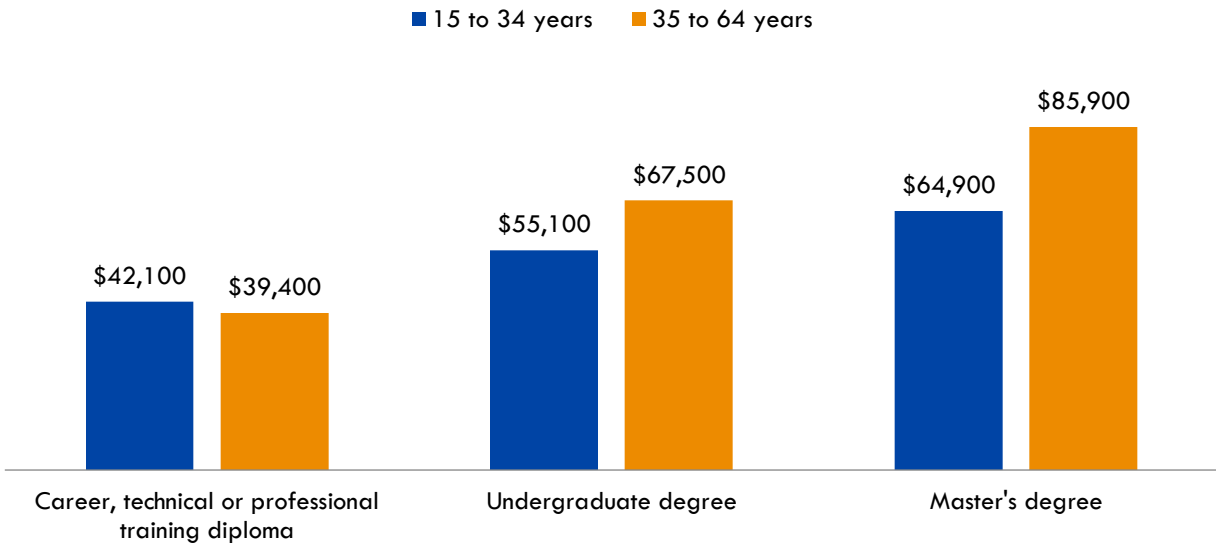


Figure 15 shows that as educational qualification increased, median employment income two and five years after graduation also increased.

**Graduate Income by Age**

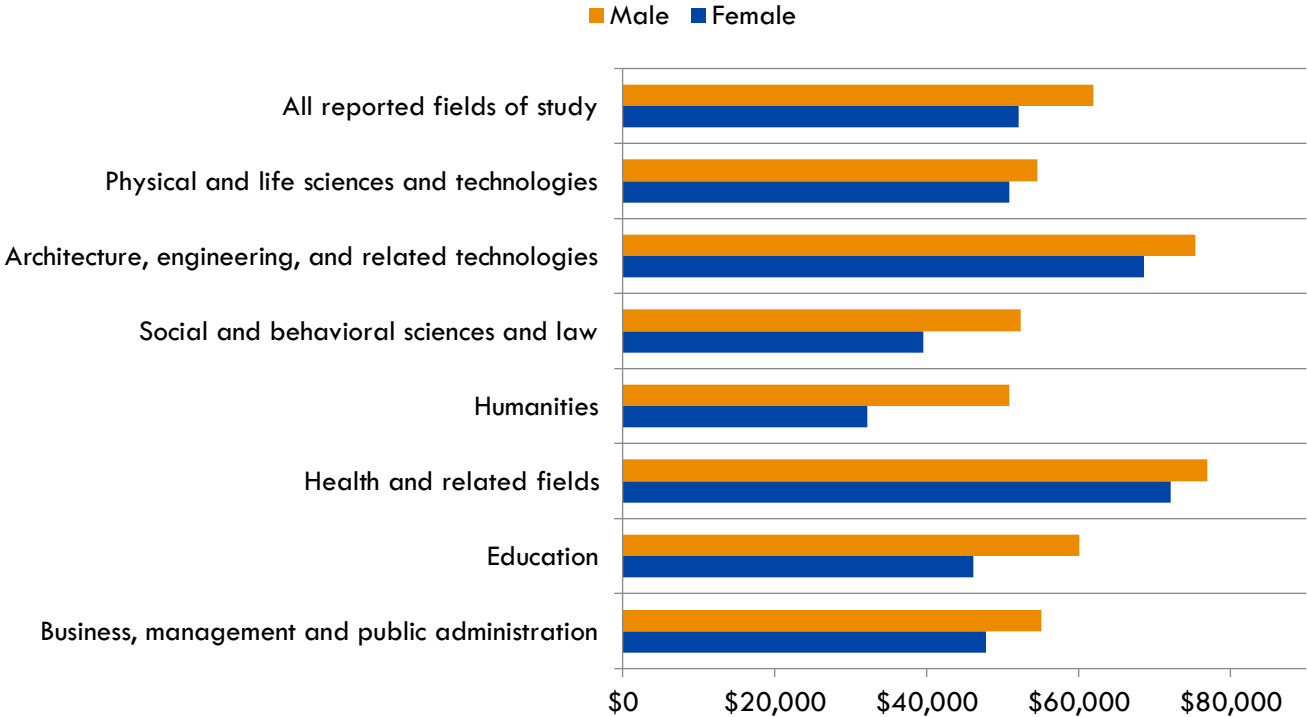
Figure 16: Median Graduate Income by Age and Educational Qualification Five Years After Graduation in NB (2017 Constant Dollars)



Five years after graduation, those who were 35 to 64 years old with an undergraduate or master's degree had higher median employment incomes than younger individuals with the same credentials. Meanwhile, graduates who were 15 to 34 years old with a career, technical or professional training diploma had a slightly higher median income than their older counterparts.

**Graduate Income by Gender**

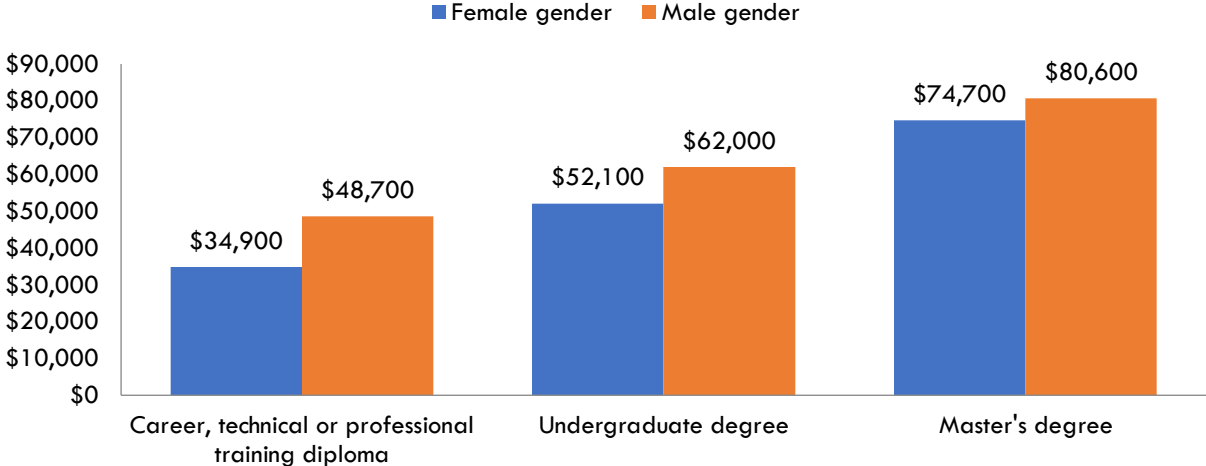
*Figure 17: Median Employment Income of 2012 NB Graduates Five Years After Undergraduate Graduation by Field of Study and Gender (2017 Constant Dollars)*



Five years after graduation, there was a wage gap present between male and female undergraduate degree holders for all fields. Male graduates had higher income in all fields, with the highest wage gap occurring in the humanities field. In all reported fields of study, 2012 male graduates made more than female graduates 5 years after graduation.



Figure 18: Median Employment Income of 2012 NB Graduates Five Years After Graduation for All Fields with Reported Income by Gender and Educational Qualification (2017 Constant Dollars)



Regardless of educational qualification, the median employment income five years after graduation was higher for males than females for all fields of study. For career, technical or professional training diploma graduates, males had incomes 40% higher than their female counterparts. Males also had 19% higher incomes after undergraduate graduation and 8% higher incomes after master's graduation compared to their female counterparts.

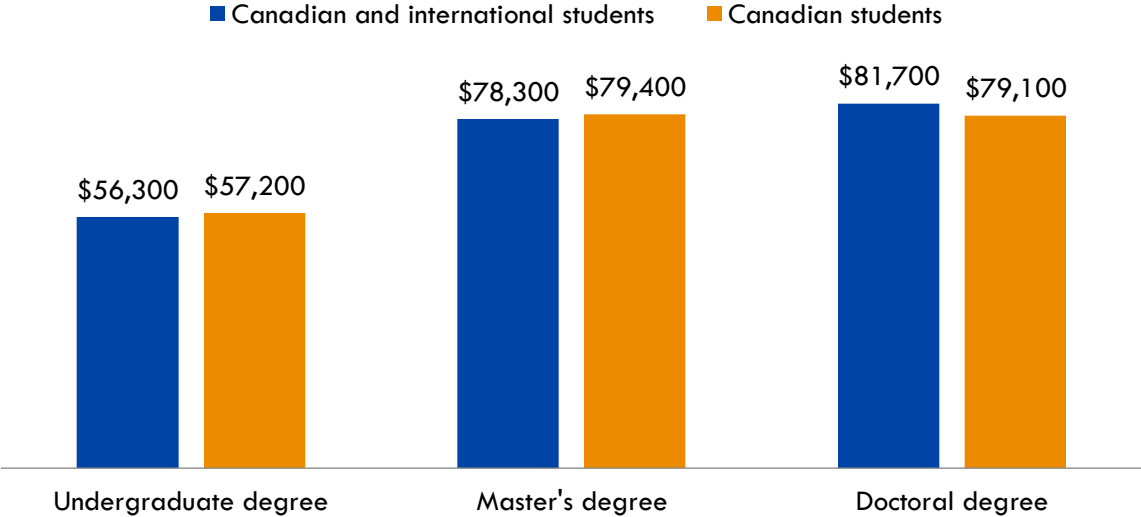
**Graduate Income by Student Status (\*data for international students alone is not available)**

Figure 19: Median Employment Income of 2012 NB Graduates Five Years After Undergraduate Graduation by Field and Student Status (2017 Constant Dollars)



In most fields, median employment income five years after undergraduate graduation was slightly lower for Canadian and international students combined than for Canadian students alone. In 2017, the reported median income in business fields for Canadian students was \$3,100 – 6% higher than the income reported for international and Canadian students grouped together – implying that international students earned less than Canadian students as the median income lowered.

Figure 20: Median Employment Income of 2012 NB Graduates Five Years After Graduation for All Fields with Reported Income by Student Status and Educational Qualification (2017 Constant Dollars)



Five years after graduation from undergraduate and master's degrees, the combined median income of international and Canadian students was lower than the sole reported median income of Canadian students. However, for doctoral degree holders, the combined income for international and Canadian students was higher.



The bottom line

# CONCLUSION

The purpose of this report is to identify how New Brunswick's postsecondary enrolments and graduate income across fields of study have been changing for students of different genders, ages, and student statuses. Evaluating the changes in enrolments in STEM and non-STEM fields may help inform policies around training and education to support growth and identify where future skill shortages may lie. Understanding how educational intake is shifting and what disparities may exist for graduate income may benefit graduates and serve as a probable solution for youth outmigration and an impending labour market gap.

There may be particular concern surrounding enrolment and graduate numbers in non-STEM fields, as both decreased between 2013 and 2017. The largest decrease occurred in health-related fields, which had 213 fewer graduates. Health-related jobs are a target occupation in NB, as the aging population requires increased healthcare, and nurses are aging as well. Therefore, aiming to increase enrolments in this field along with social assistance, business and transportation may be a solution for an impending labour market gap.

STEM field graduate numbers remained relatively stable, with an increase of graduates in mathematics and computer sciences, along with NB having a higher proportion of STEM graduates than Canada. This highlights the opportunity for growth in STEM-related occupations; however, enrolment numbers may be negatively impacted by youth outmigration. Postsecondary graduate numbers were two to three times lower than enrolment numbers, which may also suggest that students need increased support to complete their education. Median income for STEM and non-STEM fields increased between two and five years after graduation, but the median income for non-STEM fields (aside from health-related fields) was lower compared to STEM fields for those who had completed their undergraduate degree.

There were also differences in graduate numbers between male and female students. The majority of non-STEM fields had a significantly higher percentage of female graduates, particularly in health-related fields (~80%). Contrarily, STEM-related fields, particularly architecture and engineering, along with mathematics and computer sciences, had a higher percentage of male students, and this gap has remained large over time. Increasing women's participation in STEM fields, and men's participation in non-STEM fields, is one way that the growing demand for STEM and non-STEM educated workers may be met.

Furthermore, despite there being more female graduates in non-STEM fields, male graduates have a higher median income. 2012 male graduates made \$9,900 more in median income five years after undergraduate graduation than female graduates for all reported fields of study. This highlights income inequality for female graduates, which may be restricting female growth in STEM and non-STEM fields.

International students contribute to the NB economy and enrich the learning environment with diverse skill sets and culture. They make up a significant portion of graduates in business, management and public administration (22%), as well as education (17%). For mathematics and computer sciences fields, international students make up 36% of graduates, which demonstrates some of the opportunities they may come looking for in the province, as well as the many job fields for which they can be assets.

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The reported median income for Canadian students five years after graduation was \$3,100 higher than the income reported for international and Canadian students grouped together, implying that international students made less than Canadian students. However, for doctoral degree holders, the combined income for international and Canadian students was higher. International students make up a significant portion of postsecondary enrolments in New Brunswick. Therefore, taking into consideration issues such as youth outmigration and an aging population, creating effective programs for international student growth and retention could possibly result in a valuable addition to the province's labour market.

Education may serve as one of the many possible solutions for New Brunswick's multi-layered economic issues, which encompass an aging population and low population growth. Increasing opportunities for students to succeed in their fields may be an overall investment in the growth of the province. Such opportunities include experiential learning to expose students to job opportunities before they graduate. Income equality for females and international students may also encourage them to contribute to New Brunswick's labour market as the province's population growth stagnates.

# REFERENCES

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Retrieved July 22, 2020, from <https://www.immigration.ca/new-brunswick-immigration-adds-10-jobs-to-list-of-target-occupations>

Statistics Canada. Table 37-10-0115-01 Characteristics and median employment income of longitudinal cohorts of postsecondary graduates two and five years after graduation, by educational qualification and field of study (alternative primary groupings), 2010 to 2012 cohorts

Statistics Canada. Table 37-10-0018-01 Postsecondary enrolments, by registration status, institution type, status of student in Canada and gender

Statistics Canada. Table 37-10-0020-01 Postsecondary graduates, by institution type, status of student in Canada and gender