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# Linking Postsecondary Non-completion Rates and Labour Market Outcomes

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# Executive Summary

Students, institutions and government are each invested in postsecondary education (PSE) completion rates. Graduates earn more, are less likely to be unemployed and have lower student loan default rates. Through a variety of programs and supports, institutions work to ensure that learners persist to graduation and transition to the workforce. Ontario's focus on completion is explicitly captured in the 2020–2025 Strategic Mandate Agreements, which tie annual reporting on graduation rates to performance-based funding.

Not all students who enrol in PSE, however, complete a credential. Non-completion is costly for both government and institutions, but particularly for students. Non-completing students invest their time and tuition but do not reap the benefits of a completed credential.

Previous research on student persistence in Ontario was limited to institution-level analyses; due to data availability, researchers could not follow students who transferred from one institution and graduated at another. The Youth in Transition Survey (1999–2010) allowed explorations of system-level educational pathways, including drop-out and transfer rates. In spite of sample-size limitations, this research revealed individual and institutional characteristics associated with completion.

Statistics Canada data and linking tools provide new opportunities to explore system-level PSE non-completion rates and non-completer labour market outcomes. This project extends research to explore the system-wide non-completion rate in Ontario; how non-completion rates vary across credential types; and the labour market outcomes for non-completers. The Higher Education Quality Council of Ontario (HEQCO) partnered with the Social Research and Demonstration Corporation (SRDC) to analyze data files from the Statistics Canada Education and Labour Market Longitudinal Platform, linking four datasets to develop descriptive and regression analyses: the Postsecondary Student Information System, the Registered Apprenticeship Information System, the T1 Family File and Canada Student Financial Assistance files.

HEQCO examined data for full-time students enrolled in Ontario PSE for the first time in fall semesters from 2011 to 2014, analyzing three outcome variables: non-completion, economic activity in the year after leaving or completing PSE and annual earnings. We measured non-completion six, seven and eight years after students' first enrolments. Explanatory variables included age, gender, immigration status, student aid in entry year, cohort, program and field of study. The earnings analysis used two completion indicators: completion status (non-completion or graduation) by year six and an estimate of the amount of schooling received between first enrolment and first-year earnings. HEQCO explored the interaction between these two indicators to understand how earnings are influenced by completion and time spent in school.

Six years after first PSE enrolment, the overall non-completion rate was 29.7%; it decreased in years seven and eight to 24.7% and 22.8%, respectively. Non-completion varied according to background characteristics, with higher rates for men, domestic students and those who received federal financial aid. Students in certificate and diploma programs had higher non-completion rates than students in bachelor's programs, despite degrees being longer in duration. Rates for students enrolled in bachelor's programs also decreased to a greater degree over time while rates for certificate and diploma students were relatively unchanged from year six to eight. These results suggest that learners make decisions about persistence long before

their sixth year in school. Differences across credential types also reflect student investments of time and money: costs and rewards are lower for students in shorter credentials, implying lower commitments to persistence and graduation.

Across credential types, non-completion rates were lowest for students who entered PSE at age 18. Mature learners may face challenges in accessing and persisting in PSE. They may also have financial constraints or family responsibilities that require their time and attention.

Graduates and non-completers had earnings differences across credential types and all fields of study. A higher percentage of non-completers did not file tax returns; those who did file earned less than graduates. Average earnings for non-completers one-year post-PSE were 51% lower than graduate earnings. Two- and three-years post-PSE, this earnings gap decreased (45% lower after two years and 32% lower after three years) but did not close.

Regression analyses showed that the earnings gap was largest among those who spent less time in PSE. For example, non-completers with three years of schooling earned more than those with two years. The analysis also showed that men non-completers earned more than women non-completers; non-completers who started PSE at age 25 to 54 earned more than non-completers who started at age 18. These results indicate that groups who face barriers to completion do not necessarily face increased earnings disadvantages.

Ontario boasts high student access and participation rates, but access is not synonymous with success. Nearly one-quarter of students who enrolled in PSE did not graduate after eight years nor did they enjoy the associated labour market benefits. Future research can shed light on sociodemographic characteristics associated with non-completion to assist government and institutions as they work towards ensuring success for all Ontario students.

# Introduction

Postsecondary education (PSE) completion is important to all stakeholders; students, institutions and governments each have strong motivations toward persistence and graduation. For students, credentials are important milestones that support their transitions into the labour market. PSE completion is associated with higher earnings, lower unemployment and career advancement (Urwin et al., 2010; Ostrovsky & Frenette, 2014; Huo et al., 2020). Students who do not complete PSE may forgo these benefits.

Student completion rates are part of PSE institutional mandates and purpose. Institutions invest in a variety of programs and supports to ensure student success, from orientation and residence life through work-integrated learning and career services. Higher completion rates benefit institutional reputation; student success communicates positive messages about institutional quality to students and families (Aljohani, 2016). Non-completion impacts institutional financial planning as dropouts represent lost tuition revenue and enrolment-based grants (Burke, 2019; Huo et al, 2020). Student recruitment and admissions are expensive processes. It is far more efficient for institutions to retain students than to replace them.

Governments are also concerned with postsecondary completion. Educational attainment has many public benefits, including skilled workers entering the workforce and citizens who are more likely to volunteer and vote (Gennaioli et al., 2013; The Organisation for Economic Co-operation and Development, 2022). Graduates also have lower student loan default rates than non-completers (Bustamante, 2019). With a better-prepared workforce, governments have lower costs for social support programs, and communities have higher economic productivity and more entrepreneurial activity (Koropeckyj et al., 2017, Statistics Canada, 2023; Huo et al.,2020; Shaienks et al., 2008). In Ontario, completion rates are tied to Strategic Mandate Agreements (SMAs), government's PSE accountability and funding framework. Graduation rates were included in institutional annual reports to the Ministry of Colleges and Universities (MCU) for many years. Under the current SMAs (2020–2025), government sharpened the focus on graduation rates by tying them to performance-based funding.

Ontario has high PSE participation and graduation rates (Statistics Canada, 2022). As in all jurisdictions, not all students who matriculate into Ontario PSE programs persist to completion. Previous Canadian research has investigated student progress through PSE, often with a focus on institution-level outcomes. Statistics Canada's Youth in Transition Survey (YITS), launched in 1999, provided important opportunities to explore system-level educational pathways, including stop-out and transfer rates (Childs et al., 2017). The YITS survey was discontinued in 2010.

This project updates previous research on non-completion using Statistics Canada's Education and Labour Market Longitudinal Platform (ELMLP) to link four datasets: the Postsecondary Student Information System (PSIS), the Registered Apprenticeship Information System (RAIS), the T1 Family File (T1FF) and Canada Student Financial Assistance (CSFA) files. Linkages provide an opportunity to explore the complex issue of non-completion in an environment that is marked by data fragmentation. No previous Canadian research has looked at employment and earnings outcomes for PSE credential holders compared to non-completers.

This study focuses on system-level non-completion rates across credentials and student characteristics, and it highlights student labour market outcomes whether they complete their PSE pathways or not. HEQCO examined data for students enrolled in Ontario PSE for the first

time in the fall semesters between 2011 and 2014 to understand graduation rates, non-completion rates and economic activity following graduation or leaving PSE. Findings offer a complex and up-to-date understanding of system-level non-completion rates and earnings outcomes for Ontario students who enrol in but do not complete a PSE credential.

## Background

Researchers and policy-makers have studied PSE student persistence and retention since the 1960s (Tight, 2020). Much of the scholarship focuses on PSE in the United States (Aljohani, 2016; Mueller, 2007; Ma & Frempong, 2013; Tight, 2020), but scholars across jurisdictions, including Canada, have investigated student progress through PSE. A continued focus on student persistence is fueled in part by access initiatives: as more students from diverse backgrounds gain access to PSE, researchers and institutions focus on facilitating student success (Davidson & Wilson, 2017). The growing interest in student success also reflects shifts in government financial support for PSE. With institutional budgets increasingly reliant on student tuition, institutions have strong incentives to reduce non-completion rates (Tight, 2020; Mueller, 2007).

Because of data limitations in Canada, research on student completion often relied on data from individual institutions or small groups of schools (Childs et al., 2017). Researchers could investigate institutional graduation rates but were unable to investigate the experiences of students who left one institution and enrolled in another. With the introduction of the YITS in 1999,[1] scholars expanded their research from institution to system-level completion using longitudinal data. The YITS-A was designed to examine the major transitions in the lives of youth, particularly between education, training and work. It included a representative sample of youth aged 15 (in 1999) with follow-up interviews every two years from 2000 to 2008.

The YITS dramatically improved opportunities to explore student persistence and completion, offering crucial insights into the educational pathways of Canadian youth (Childs et al., 2017; Gallagher-Mackay, 2017). Researchers studied the variety of individual and institutional characteristics associated with persistence, including students' academic and social integration (Ma & Frempong, 2013), student loans, academic performance in high school and parents who went to PSE (Shaienks et al., 2008). Researchers also looked at characteristics associated with dropout: low PSE achievement and interest, financial concerns, disability status, low-income background, and rural, first-generation and Indigenous status (Finnie et al., 2012; Finnie & Mueller, 2015; Shaienks et al., 2008).

YITS-based research also had limitations. The survey used a representative sample of Canadians. With attrition between follow-up interviews, the sample became smaller in each cycle (Finnie et al., 2012). YITS data allowed a study of five-year graduation rates only, which is shorter than the timeframe typically used to calculate baccalaureate graduation rates, and the sample size was too small for reporting any detail on sociodemographic factors.

[1] There were two versions of the YITS: YITS-A and B. The two datasets tracked individuals based on a series of follow-up interviews carried out at two-year intervals. YITS-A captured high school students born in 1984 (i.e., aged 15 as of December 1999) and then followed them through five cycles of subsequent surveys. YITS-B was initiated simultaneously and captured Canadians aged 18 to 20. YITS-A included more detail on family background and high school experiences.

# Research Questions and Methodology

Currently available Statistics Canada data and linking tools can extend previous research on non-completion rates and non-completer outcomes in Ontario. This project addresses the following questions:

- What is the system-wide rate of non-completion in Ontario?
- How do non-completion rates vary across credential types?
- What are the labour market outcomes for non-completers?

HEQCO partnered with SRDC to conduct descriptive and regression analyses using data files from the Statistics Canada Education and Labour Market Longitudinal Platform (ELMLP) to examine the research questions. Data preparation involved linking PSIS and RAIS data to the T1FF and CSFA data. Two samples were created: a sample of full-time students in Ontario who first enrolled in a diploma,[2] certificate[3] or undergraduate program[4] at a publicly assisted college or university during the fall of 2011, 2012, 2013 or 2014; and a CSFA student aid sample with students from the Ontario sample who received CSFA aid in their first year of study.[5]

## Outcome Variables

The analyses focused on three main outcome variables: non-completion, economic activity in the year after leaving or completing PSE and annual earnings. The non-completion outcome variable measured non-completion six, seven and eight years after students first entered a PSE program.[6,7] The economic activity outcome variable examined labour market entry after completing or leaving PSE.[8] The earnings analysis included only those individuals who filed taxes and reported earnings over $0 for up to three years after completing or leaving a program. For regressions, the earnings were logarithmically transformed and adjusted for inflation.

## Explanatory Variables

All analyses included a series of indicators that captured age group at entry, gender, immigration status at entry, whether a student received CSFA student aid in their entry year, entry cohort, program and field of study.

The earnings analysis included two completion indicators and an interaction between them. The first completion indicator measured completion status (i.e., if the student was a non-completer or graduate) by year six. The second completion indicator provides an estimate of the amount of schooling received by measuring elapsed time between the date when the student first enrolled in PSE to when their first-year earnings were measured.[9] Using these two completion indicators,

[2] Ontario diploma programs are typically two to three years in duration.
[3] Ontario certificate programs are typically one to two years in duration.
[4] The majority of undergraduate programs in Ontario are offered at universities. Most programs are four years in duration.
[5] CSFA student aid data did not include any provincial student aid information.
[6] The 2014 entry cohort was not included in the eight-year non-completion calculation as data availability at the time of analysis censored their results.
[7] The data track completion in any PSE program. A student who started in a bachelor's program may have completed that program or a program at another institution, including a college certificate or diploma.
[8] The economic activity outcome variable excluded those who remained in or continued PSE (categorical binary variable); those who did not file taxes and therefore had no earnings information (categorical binary variable); and those who filed taxes but reported zero earnings (categorical binary variable).
[9] This variable measured elapsed time since the start of PSE enrolment (minus any gap years for graduates). All people were assumed to have at least one year of PSE experience as we counted their entry year, and the data did not provide information on when a person left. Leaving is captured by the absence of PSIS records in the following year.

an interaction term between completion status and elapsed time since the start of PSE enrolment was included. The interaction term was used in regression analyses to help understand how the gap in earnings is influenced by completion and the amount of time spent in school.

Descriptive analyses were conducted to provide insight into the relationship between length of time since starting PSE, completion and CSFA funding status, as well as earnings by completion status, age, credential and program of study. Regression analyses were conducted to investigate completion status and earnings while controlling for age, gender, immigration status, receipt of federal student aid, cohort and program type.[10]

## Findings

Non-completion rates varied according to how long students were tracked in the system. Six years after first PSE enrolment, the system-wide rate of non-completion in Ontario was 29.7%. Non-completion rates decreased when two additional years were tracked, falling to 24.7% after seven years and to 22.8% after eight years.

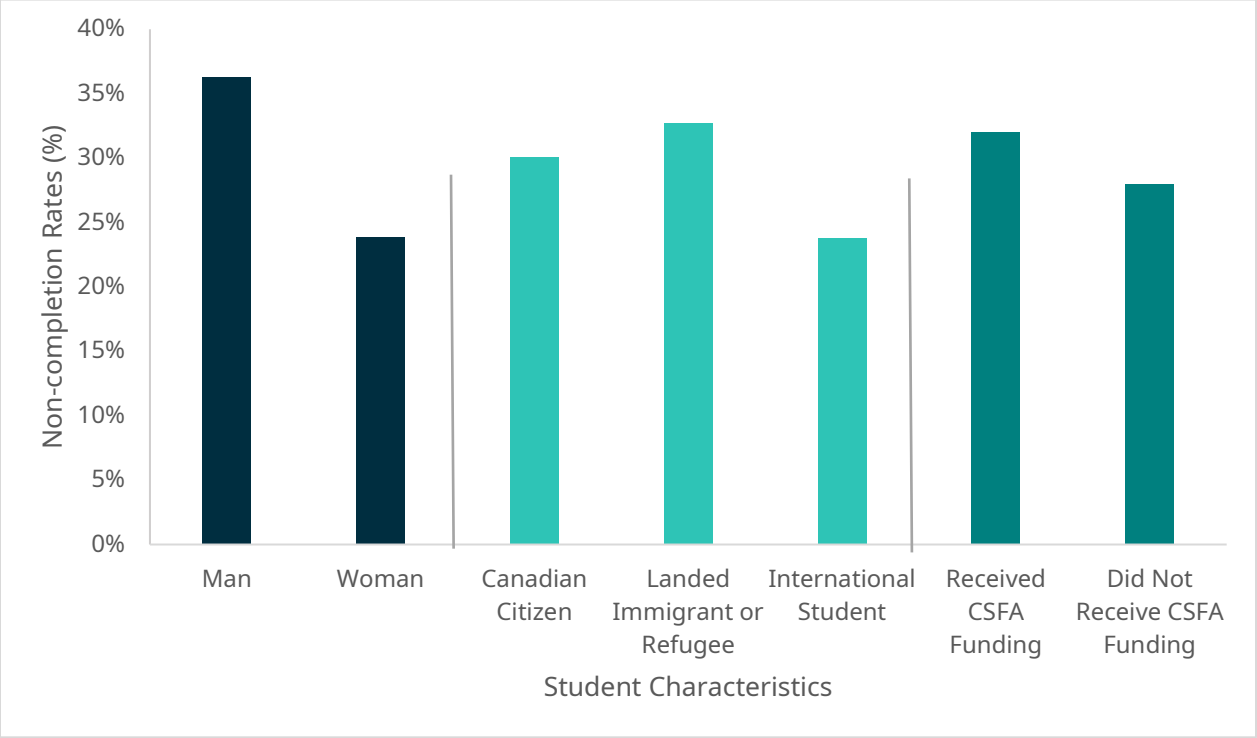
Consistent with previous research, non-completion rates varied across student background characteristics, including gender, domestic/international status and family income.[11] Figure 1 shows that women students had significantly lower non-completion rates than men, and international students had lower non-completion rates than domestic students as well as landed immigrants or refugees.

[10] A linear probability model was used for the non-completion analysis to determine the extent to which each explanatory variable influenced non-completion. For the economic activity outcome variable, a multinomial logit model was used to determine the extent to which each explanatory variable influenced each outcome category (i.e., in school, no tax return, zero earnings or earner). For the earnings analysis, an ordinary least squares regression was used to determine the extent to which each explanatory variable influences the continuous outcome (i.e., inflation adjusted log earnings).

[11] The samples included only full-time students. A separate analysis examined non-completion rates among students who studied part-time in their first observed semester. Once the model controlled for other indicators, part-time students were 35 percentage points more likely than full-time students to not complete their credential within six years. Part-time status was the most important indicator associated with non-completion in this regression model.

Figure 1

*Student Non-Completion Rates by Gender, Immigration Status and CSFA Funding Status at PSE Entry Six Years After First Enrolment*




*Source:* PSIS and RAIS
*Note*: This figure shows six-year non-completion rates by gender, immigration status and Canadian Student Financial Assistance Program status.

Non-completion rates were also higher for students who received federal financial aid through the CSFA: 32% versus 28% for those who did not receive aid.[12,13] Total amount of aid, however, did not affect completion rates. Students who received the highest amount of aid and students who received the lowest amount of aid had comparable non-completion rates.

Non-completion rates varied by credential type.

Table 1 shows non-completion rates for different credential types after six, seven and eight years. Non-completion rates were lowest for students enrolled in bachelor's degree programs in each year studied, despite bachelor's programs being longest in duration. Non-completion rates for students enrolled in bachelor's programs also decreased to a greater degree over time than rates for students enrolled in certificates and diplomas. Rates for students in certificate and diploma programs were relatively unchanged from year seven to year eight.

[12] During the timeframe of this study, the CFSA program was called the Canada Student Loan Program (CSLP).
[13] Forty-four percent of incoming Ontario students received federal student aid.

Table 1

*Non-completion Rates for Ontario Certificate, Diploma and Bachelor's Degree Students, Six, Seven and Eight Years After First Enrolment*

| Credential | Six-year Non-completion Rate (n=584,310) | Seven-year Non-completion Rate (n=584,310) | Eight-year Non-completion Rate (n=433,360) |
|---|---|---|---|
| Certificate | 32.3% | 30.7% | 30.1% |
| Diploma | 35.2% | 33.4% | 33.0% |
| Bachelor's Degree | 26.4% | 19.1% | 16.3% |

*Source:* PSIS and RAIS

*Note*: This table shows non-completion rates for Ontario students enrolled in certificate, diploma and bachelor's degree programs six, seven and eight years after first higher education enrolment.

The stability of the non-completion rates for certificate and diploma students in years six through eight suggests that learners made decisions about whether to persist long before their sixth year of study. Previous research indicates that most Ontario college students who are going to graduate do so by their third year, and over half do so in their second year (Childs et al., 2017). Both college and university students are most at risk of leaving in their first year when they are navigating the social and academic challenges associated with transition into PSE settings (Childs et al., 2017; Mueller, 2007).

Non-completion patterns by credential are consistent with prior research that found graduation rates are higher in more selective programs (such as bachelor's degrees), including while controlling for students' level of academic performance and other factors related to entrance requirements (Bowen et al., 2009). Rates of non-completion reflect differences in student investments of time and money. Both costs and rewards are lower for students in shorter credentials, so their commitment to graduation may also be lower. The fact that the bachelor's degree non-completion rate continues to decrease through year eight reflects students' ongoing (and increasing) investment in the goal of graduation. Students who invest in several years of PSE have incentives to complete their programs to benefit from the time spent in school.

Student decisions to leave PSE are complex (Villano et al., 2018). Non-completion rates are influenced by individual characteristics, such as student engagement and PSE academic achievement. Previous research illustrates that completion rates increase when a student's goals are aligned with program focus (Nieuwoudt & Pedler, 2021). Students with higher postsecondary GPAs graduate at higher rates than those who struggle academically. In a recent study, postsecondary grades were the most significant determinant of both university and college graduation (Au et al., 2023). Institutional and program characteristics, including academic and social support programming and admissions criteria, also shape students' persistence decisions (Aljohani, 2016; Ma & Frempong, 2013).

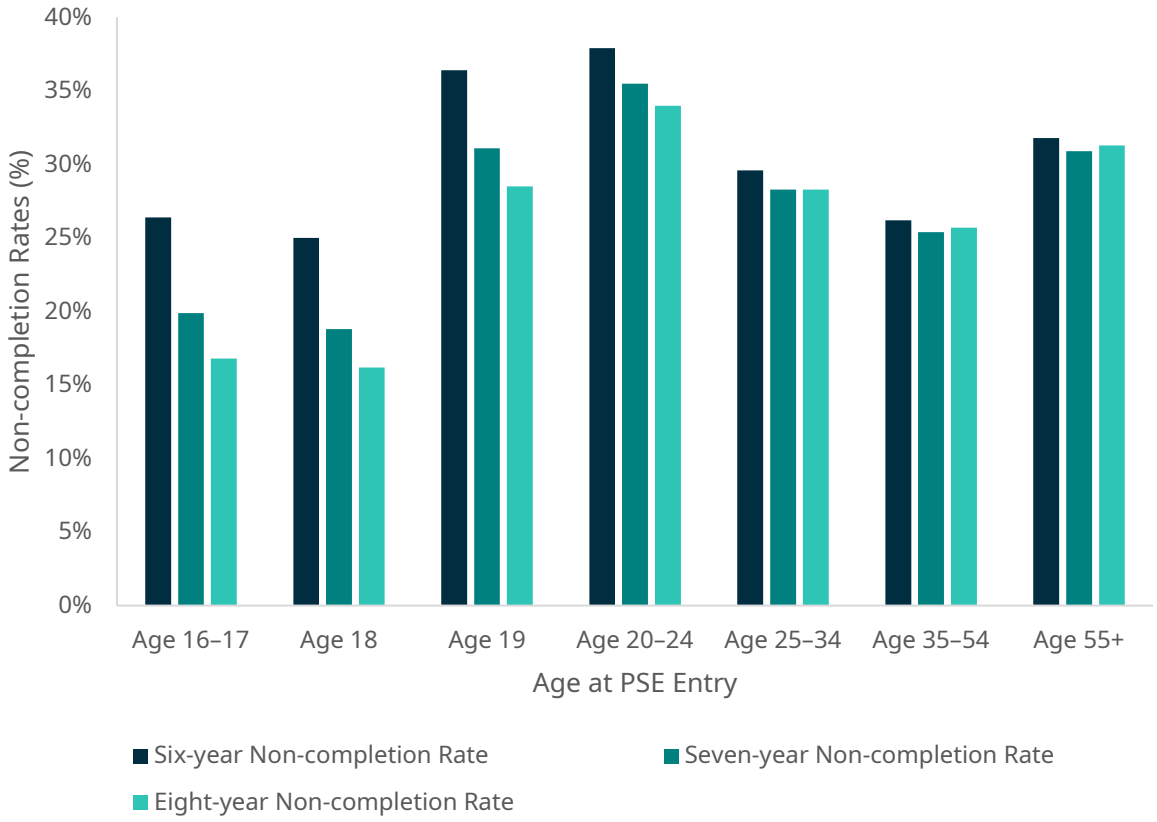
## Older students had higher rates of non-completion.

Across all credential types, non-completion rates were lowest (25% at year six) for students who entered PSE at age 18, a group that likely matriculated to PSE directly from high school. Figure 2 shows that students who enrolled at age 19 and between the ages 20 to 24 had significantly higher non-completion rates. Differences between year six and year eight non-completion rates

were greater for students who entered PSE between the ages of 16 to 18 than all other age categories (see Appendix A for full regression results).[14]

Figure 2

*Student Non-completion Rates by Age at PSE Entry, Six, Seven and Eight Years After First Enrolment*




*Source:* PSIS and RAIS
*Note:* This figure shows student non-completion rates six, seven and eight years after first enrolment by age at PSE entry.

In general, 16 to 17 and 18-year-olds have lower starting non-completion rates and a steeper slope over time: to 16.8% and 16.2% non-completion at eight years. These results indicate that a higher proportion of younger-age cohorts are working toward graduation through the eight-year window. In contrast, there was little change in non-completion rates for the older age cohorts from six through eight years; those who started at age 19 have larger changes between year six and eight than any older student group, but their non-completion rates at year eight are still higher than the overall eight-year rate. More time in the system generally does not lead to lower non-completion rates for students who enrol in PSE for the first time at age 25 and above.

[14] The sample size differs between years seven and eight. Six- and seven-year non-completion could be tracked for the 2011 to 2014 cohorts, while eight-year non-completion could be tracked only for the 2011 to 2013 cohort. The slight increase in non-completion for those aged 35 and older is due to this difference.

These results align with prior research related to mature learners. Non-traditionally aged students may face challenges in accessing and persisting in PSE. Older students do not have the benefit of secondary school resources that can assist during their decision-making. These students may also require flexible learning options, face financial constraints or have family responsibilities that compete for their time and attention (Iloh, 2018; van Rhijn et al., 2016).

In combination with higher non-completion rates for shorter credentials, these results are important in the context of government initiatives aimed at facilitating transitions into the labour market and rapid retraining opportunities. The Ontario government recently granted colleges permission to offer three-year baccalaureate programs and has invested more than $60M in the development of microcredentials since 2020. Short programs may seem attractive as options for ensuring that graduates can move more quickly into the labour market or reskill after displacements, but these programs may also be associated with higher rates of non-completion, particularly for older (and/or part-time) students.

### Employment earnings were lower for non-completers.

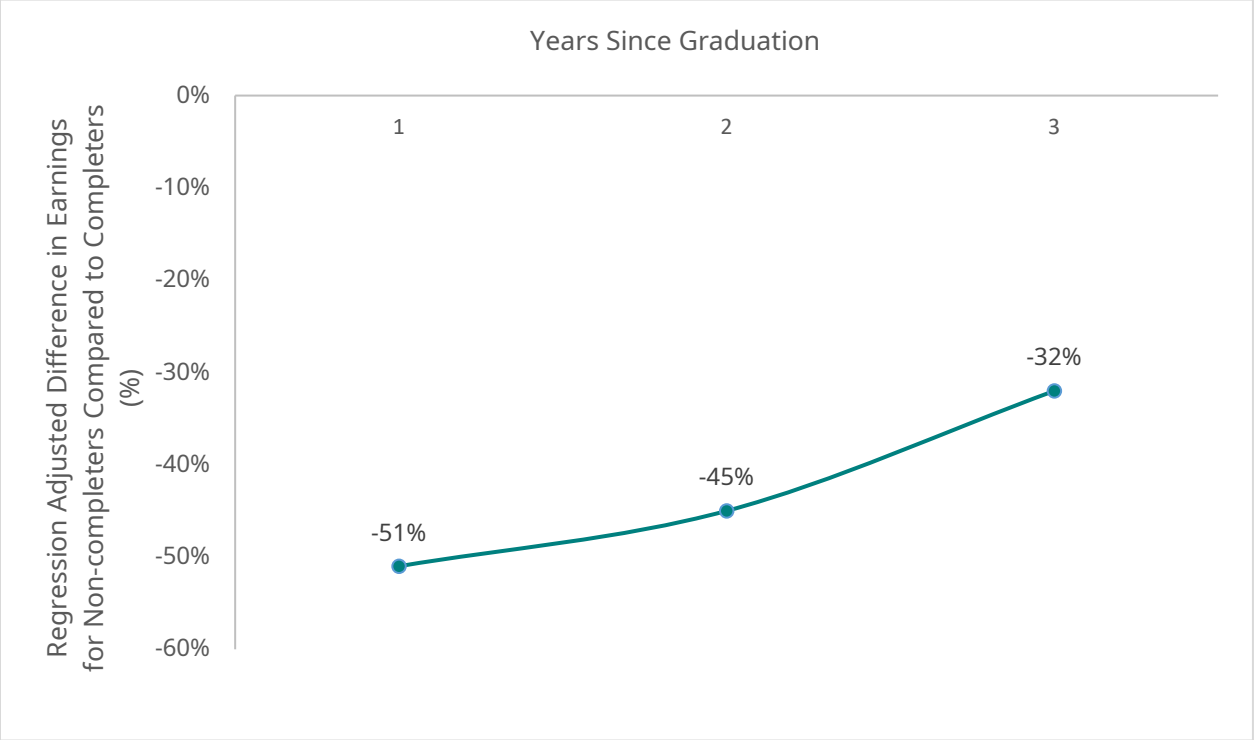
Non-completing students invested in PSE and paid opportunity costs, but they did not reap the labour market benefits of a completed credential. Earnings premiums for PSE graduates are well-established in research; on average, earnings are higher for PSE graduates than for those without PSE credentials (Zeman, 2023). Earnings also differ by credential type: graduates with bachelor's degrees earn more on average than those with certificates and diplomas (Colyar et al., 2022).

Findings from this study show earnings differences between credentialed graduates and those who start PSE credentials but do not complete them. There were significant differences between graduates and non-completers across multiple indicators: a higher percentage of non-completers did not file tax returns (15.4% compared to 7.6% among graduates), and a higher proportion of non-completers (4.7%) than graduates (2.1%) had available tax information but did not report any earnings in their first year post-PSE.

Descriptive and inferential analyses show first-year earnings for non-completers were significantly lower than earnings for graduates. Once a regression model controlled for other factors, average one-year post-PSE earnings for non-completers were an estimated 51% lower than graduate earnings. Figure 3 shows the regression-adjusted earnings gap between graduates and non-completers one-, two-, and three-years post-PSE (see Appendix A for full regression results).

Figure 3

*Earnings Differences for Non-Completers Compared to Completers One, Two and Three Years After Leaving PSE*



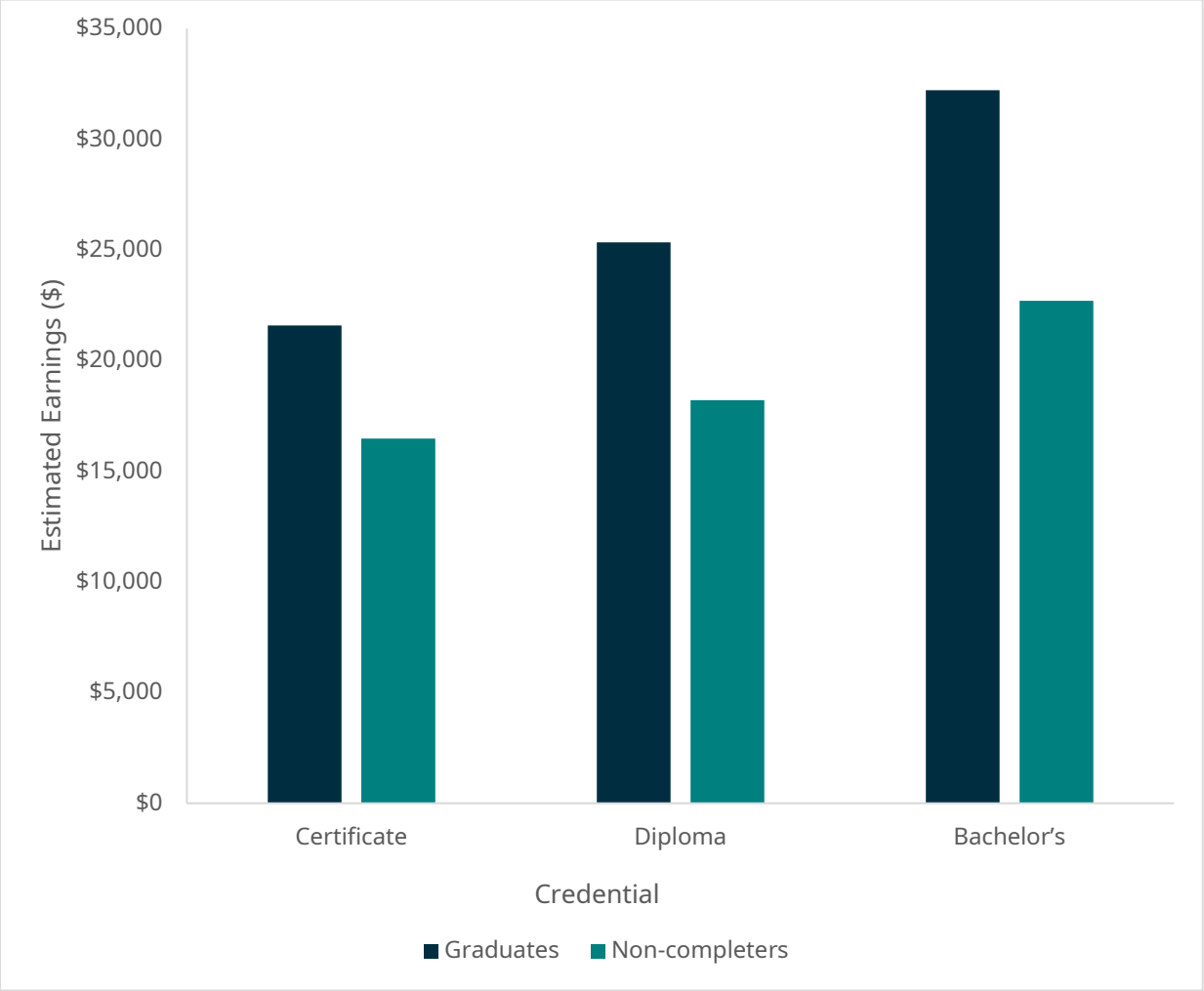

*Source*: PSIS, RAIS and T1FF
*Note*: This figure shows differences in earnings for non-completers compared to completers one, two and three years after leaving PSE.

Though the earnings gap decreased over the three years included, it did not close entirely. This reinforces the value ascribed to credentials, separate and apart from skills or experience. These differences are significant in the first years after leaving PSE, but they also have longer-term importance. Initial earnings serve as the foundation for future growth over the course of a career. In their review of various predictors of long-term earnings, Kim et al. (2018) reported that cross-sectional earnings are more predictive of longer-term earnings than demography or occupation. Consistent with other research, Kim et al. also noted the significance of educational attainment for lifetime earnings: PSE has a persistent and positive effect (Tamborini et al., 2015).

While non-completers who entered the labour market after leaving school earned substantially less than graduates, earnings differences varied significantly by time spent in school. Regression analyses revealed that the earnings gap between non-completers and graduates was largest among those who spent less time in PSE. In other words, on average, a student who started but did not complete a credential earned more with three years of schooling than with one or two years. Earnings gaps between completers and non-completers also varied by credential type and field of study when they began PSE. Figure 4 shows the difference in earnings by credential type and completion status.

Figure 4

*Earnings Differences Between Non-Completers and Completers One Year After Leaving PSE by Credential Type*

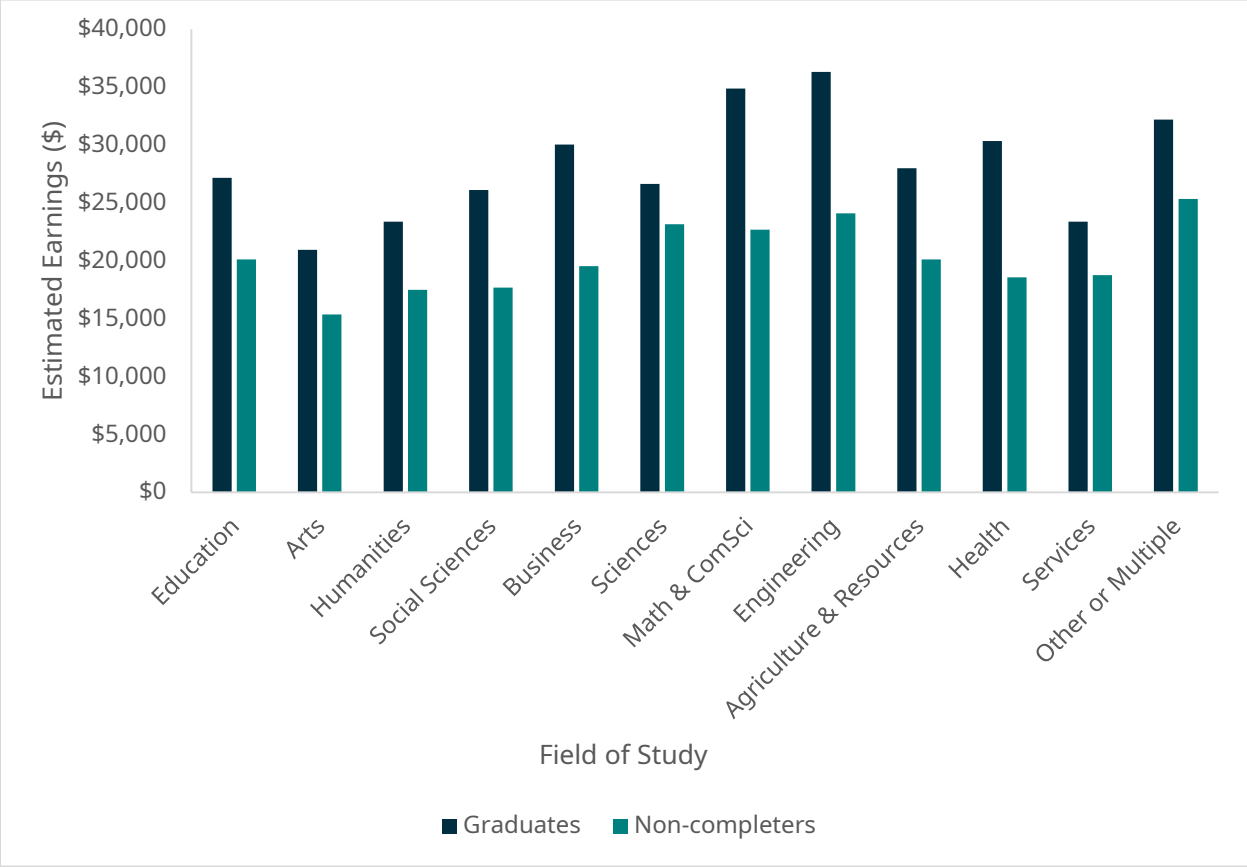



*Source*: PSIS, RAIS and T1FF
*Note*: This figure shows earnings differences for completers and non-completers one year after leaving PSE, by credential type.

The general differences between credential types reflect research showing that graduates with more advanced credentials earn more in the labour market. Within all credential types, non-completers earned less than completers, including after regression analyses adjusting for other factors, such as gender, age and program type (see Appendix A for full regression results). This demonstrates that the impact of completion on earnings matters regardless of credential type. Earnings varied considerably by field of study at entry as well. Figure 5 shows that across all fields, graduates earned more than non-completers in their first year after leaving PSE.

Figure 5

*Earnings Differences for Non-Completers and Completers One Year After Leaving PSE, by Field of Study at Entry*



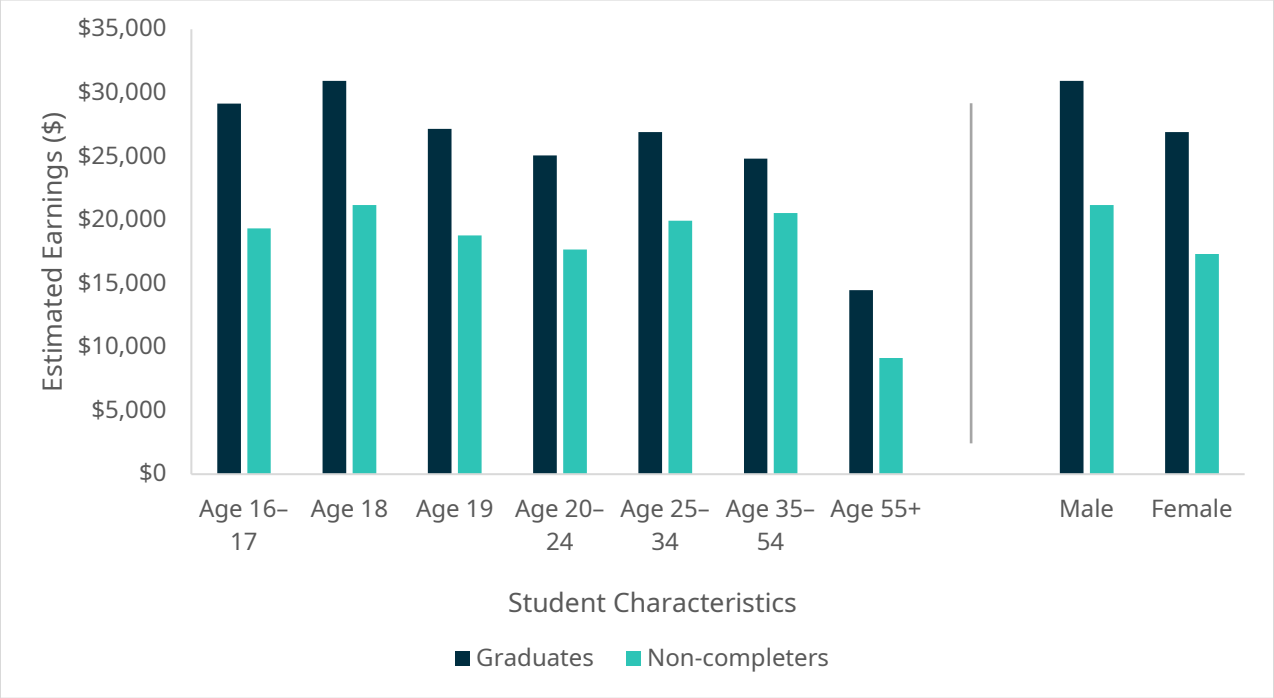

*Source:* PSIS, RAIS and T1FF
*Note:* This figure shows earnings differences for non-completers and completers one year after leaving PSE by field of study.

## Non-completion does not impact students' labour market outcomes uniformly.

Just as there are earnings differences by credential and field, there are differences for non-completers according to their age and gender. Figure 6 shows earnings for graduates and non-completers one year after leaving PSE. This analysis offers a unique contribution to the study of post-PSE earnings, which has generally focused on those who complete.

Figure 6

*Descriptive Earnings Differences for Non-Completers and Completers One Year After Leaving PSE, by Age and Gender*




*Source:* PSIS, RAIS & T1FF
*Note*: This figure shows earnings differences between completers and non-completers one year after leaving PSE by age and gender.

Regression analyses added further context to descriptive findings. Men non-completers earned 14% more than women non-completers one year after they left PSE. This earnings gap was larger than among graduates: men graduates earned 6.6% more than women. Mid-career-aged students earned more than other non-completers. Regression analyses showed those who were aged 25 to 54 at PSE entry earned more (15 to 21%) than non-completers who started PSE at age 18 (see Appendix A for full regression results). These results illustrate that groups who face barriers to completion do not necessarily face increased earnings disadvantages. For example, men are less likely to complete PSE, but non-completing men earn more than non-completing women. For those who start PSE as older students, previous work experience may mitigate some of the earnings penalty of non-completion.

## Conclusion

Policy-makers in Ontario are focused on improving access to PSE for all learners. Government has granted college and university status to new entities, supported the expansion of publicly assisted PSE institutions through new credentials and in new communities, expanded programming, enhanced student financial supports and provided funding for access and transitions programming. These efforts have helped establish Ontario as a global leader in postsecondary access. Findings from this study, however, show that access to PSE is not synonymous with success: nearly one-quarter of Ontario students who enrolled in a PSE

credential did not finish it after eight years. These non-completers invested time and financial resources, but they did not reap the labour market benefits associated with completing a PSE credential.

Findings from this study highlight the importance of broadening an access priority to include retention, persistence, completion and non-completion. Government is focused on completion through the reporting of graduation rates and employment outcomes included in institutional Strategic Mandate Agreements. These metrics focus only on those who graduate. This research brings attention to learners not captured in accountability reports.

The methodology used in this project extends previous research and provides a model for future work on this issue. Linked data through the ELMLP allow for a system-level understanding of student pathways, which are not always linear or direct, and provide an opportunity to understand students' labour market outcomes. Findings related to gender and age provide an important window into the impact of demographic factors on post-PSE earnings for non-completers, and further research can provide additional insights.

Using linkages to census data, HEQCO will explore non-completion according to students' sociodemographic characteristics in a future report. These results can assist government and institutions in understanding opportunities to enhance student supports equitably. Future research should also examine the costs of non-completion for institutions and government. A focus on costs will offer important perspectives in an environment marked by financial constraint and underfunding.

While not all students will choose to complete the programs they enrol in, all learners who choose to enter PSE in Ontario should have opportunities to be successful. Graduates' successes have long-term individual benefits that extend into social and community returns. A renewed focus on non-completion and new research approaches can help strengthen Ontario's college and university sectors and ensure the province's economic vitality.

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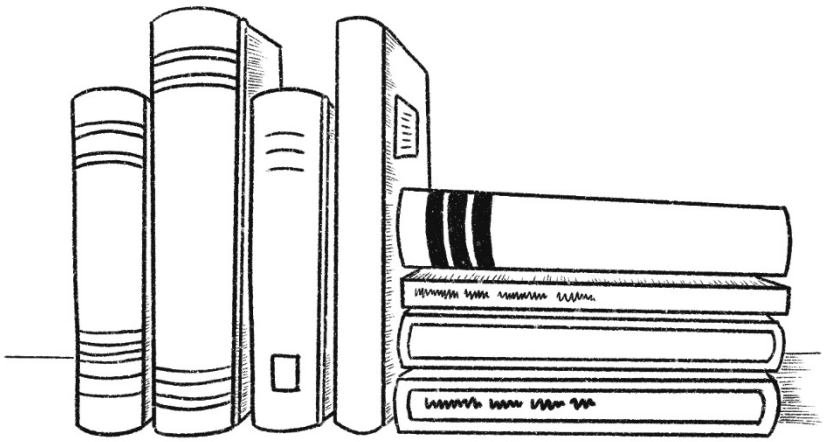

# Linking Postsecondary Non-completion Rates and Labour Market Outcomes in Ontario

Appendix

Table 2

*Regression Results: Six-, Seven- and Eight-year Non-completion Outcomes*

| PSIS Indicators | Sixth Year | Seventh Year | Eighth Year |
|---|---|---|---|
| Age at PSE Entry (Age 18) | | | |
| 16–17 | 0.027 | 0.021 | 0.011 |
| | (0.014) | (0.011) | (0.013) |
| 19 | 0.096*** | 0.095*** | 0.089*** |
| | (0.0056) | (0.0054) | (0.0051) |
| 20–24 | 0.11*** | 0.12*** | 0.13*** |
| | (0.0082) | (0.0084) | (0.0084) |
| 25–34 | 0.031* | 0.051*** | 0.064*** |
| | (0.012) | (0.013) | (0.014) |
| 35–54 | 0.0068 | 0.028* | 0.043** |
| | (0.013) | (0.014) | (0.014) |
| 55+ | 0.056* | 0.074** | 0.082*** |
| | (0.023) | (0.023) | (0.023) |
| Male/Female (Female) | | | |
| Male | 0.11*** | (0.023) | 0.093*** |
| | (0.0045) | (0.0044) | 0.093*** |
| Landed Immigrant or Refugee | 0.0073 | -0.0072 | -0.0086 |
| | (0.013) | (0.012) | (0.011) |
| International Student | -0.094*** | -0.090*** | -0.078** |
| | (0.024) | (0.024) | (0.024) |
| Missing | -0.090 | -0.075 | -0.100 |
| | (0.059) | (0.059) | (0.062) |
| CSLP Student Aid (None) | | | |
| Accessed Funding in First Year | 0.042*** | 0.035*** | 0.031*** |
| | (0.0040) | (0.0040) | 0.0040) |
| Entry Cohort (2011) | | | |
| 2012 | -0.016 | -0.014 | -0.014 |
| | -0.0100 | (0.0095) | (0.0089) |
| 2013 | -0.022 | -0.021 | -0.021 |
| | (0.015) | (0.013) | (0.013) |
| 2014 | -0.020 | -0.019 | |
| | (0.016) | (0.014) | |
| Entry Program Level (BA) | | | |
| Certificate Program | 0.045 | 0.094*** | 0.11*** |
| | (0.025) | (0.022) | (0.022) |
| Diploma Program | 0.068** | 0.12*** | 0.14*** |
| | (0.024) | (0.021) | (0.023) |
| Entry Field of Study (Education) | | | |

| PSIS Indicators | Sixth Year | Seventh Year | Eighth Year |
|---|---|---|---|
| Arts | 0.14*** | 0.12*** | 0.11*** |
| | (0.033) | (0.026) | (0.025) |
| Humanities | 0.17*** | 0.15*** | 0.14*** |
| | (0.037) | (0.029) | (0.027) |
| Social Sciences | 0.13*** | 0.11*** | 0.10*** |
| | (0.033) | (0.027) | (0.026) |
| Business | 0.10** | 0.082** | 0.080** |
| | (0.031) | (0.025) | (0.024) |
| Sciences | 0.12*** | 0.087** | 0.073** |
| | (0.033) | (0.026) | (0.025) |
| Math or Computer Science | 0.19*** | 0.13*** | 0.11*** |
| | (0.033) | (0.032) | (0.031) |
| Engineering | 0.092** | 0.044 | 0.033 |
| | (0.033) | (0.025) | (0.023) |
| Agriculture or Resources | 0.061 | 0.045 | 0.043 |
| | (0.037) | (0.030) | (0.029) |
| Health | 0.044 | 0.026 | 0.019 |
| | (0.034) | (0.026) | (0.024) |
| Service Fields | 0.11** | 0.090** | 0.088** |
| | (0.033) | (0.027) | (0.026) |
| Other or Multiple Fields | 0.16** | 0.13* | 0.13* |
| | (0.058) | (0.063) | (0.065) |
| Intercept | 0.072* | 0.034 | 0.016 |
| | (0.027) | (0.022) | (0.021) |
| Observations | 584,310 | 584,310 | 433,360 |
| $R^2$ | 0.048 | 0.062 | 0.070 |

*Note:* This table shows the results of linear probability models measuring non-completion (=1) as the outcome variable. Separate models measure this outcome six (Column 1), seven (Column 2), and eight (Column 3) years after starting a certificate, diploma, or undergraduate program in Ontario. The explanatory variables included in the model are categorical, and the reference group for each variable is in parentheses next to the bolded variable title. Cluster robust standard errors are in parentheses under each coefficient. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The 2014 entry cohort was not included in the eight-year non-completion analysis due to data availability.

Table 3

*Regression Results: Log Earnings One, Two, and Three Years After PSE Controlling for Completion and PSIS Indicators*

| Completion Status by Year Six (Graduate) | Year One | Year Two | Year Three |
|---|---|---|---|
| Non-completer | -0.51*** | -0.45*** | -0.32*** |
| | (-0.023) | (0.021) | (0.021) |
| Time Since Start of PSE Enrolment | | | |
| | 0.087*** | 0.082*** | 0.092*** |
| | (0.0088) | (0.0056) | (0.0060) |
| Completion*Time Interaction | | | |
| | 0.051*** | 0.035*** | -0.0076 |
| | (0.0051) | (0.0040) | (0.0078) |
| PSIS Indicators | | | |
| Age at PSE Entry (Age 18) | | | |
| 16–17 | -0.042 | -0.016 | -0.026 |
| | (0.025) | (0.021) | (0.028) |
| 19 | -0.048*** | | |
| | (0.0078) | (0.0090) | (0.010) |
| 20–24 | -0.027* | -0.047*** | |
| | (0.010) | (0.011) | (0.011) |
| 25–34 | 0.094*** | 0.043* | 0.027 |
| | (0.019) | (0.018) | (0.018) |
| 35–54 | 0.060* | 0.067** | 0.066** |
| | (0.022) | (0.022) | (0.023) |
| 55+ | -0.51*** | -0.47*** | -0.38*** |
| | (0.12) | (0.11) | (0.096) |
| Male/Female (Female) | | | |
| Male | 0.083*** | 0.14*** | 0.19*** |
| | (0.010) | (0.011) | (0.011) |
| Landed Immigrant or Refugee | -0.055*** | | |
| | (0.019) | (0.013) | (0.016) |
| International Student | -0.069* | 0.021 | -0.038 |
| | (0.030) | (0.024) | (0.020) |
| Missing | 0.053 | 0.068** | 0.040 |
| | (0.043) | (0.024) | (0.029) |
| CSLP Student Aid (None) | | | |
| Accessed Funding in First Year | -0.068*** | | |
| | (0.0087) | (0.0066) | (0.0074) |
| Entry Cohort (2011) | | | |
| 2012 | 0.024** | 0.0050 | 0.0047 |
| | (0.0077) | (0.0075) | (0.0100) |
| 2013 | 0.045*** | 0.022* | 0.025* |

| | | | |
|---|---|---|---|
| | (0.011) | (0.010) | (0.012) |
| 2014 | 0.053*** | 0.032** | 0.037** |
| | (0.013) | (0.0095) | (0.013) |
| Entry Program Level (BA) | | | |
| Certificate Program | -0.21*** | -0.24*** | -0.24*** |
| | (0.032) | (0.027) | (0.025) |
| Diploma Program | -0.11** | -0.14*** | -0.13*** |
| | (0.031) | (0.022) | (0.021) |
| Entry Field of Study (Engineering) | | | |
| Education | -0.27*** | -0.26*** | -0.20*** |
| | (0.051) | (0.044) | (0.043) |
| Arts | -0.49*** | -0.44*** | -0.41*** |
| | (0.040) | (0.036) | (0.033) |
| Humanities | -0.46*** | -0.38*** | -0.34*** |
| | (0.039) | (0.031) | (0.028) |
| Social Sciences | -0.34*** | -0.30*** | -0.27*** |
| | (0.030) | (0.026) | (0.023) |
| Business | -0.20*** | -0.19*** | -0.18*** |
| | (0.019) | (0.017) | (0.016) |
| Sciences | -0.40*** | -0.29*** | -0.24*** |
| | (0.048) | (0.037) | (0.038) |
| Math or Computer Science | -0.11** | -0.067* | -0.046 |
| | (0.037) | (0.030) | (0.032) |
| Agriculture or Resources | -0.23*** | -0.23*** | -0.21*** |
| | (0.046) | (0.040) | (0.030) |
| Health | -0.11** | -0.10** | -0.094*** |
| | (0.034) | (0.031) | (0.025) |
| Service Fields | -0.22*** | -0.20*** | -0.19*** |
| | (0.021) | (0.018) | (0.019) |
| Other or Multiple Fields | -0.20*** | -0.17** | -0.16* |
| | (0.043) | (0.051) | (0.067) |
| Intercept | 10.2*** | 10.4*** | 10.4*** |
| | (0.036) | (0.025) | (0.028) |
| Observations | 267,610 | 185,030 | 136,360 |
| $R^2$ | 0.12 | 0.13 | 0.12 |

*Note:* This table presents the results of three separate OLS models examining CIP adjusted log earnings (excluding those who earned $0) one, two, and three years after students from all four cohorts left or graduated from a PSE program. Each column represents a separate model. The majority of explanatory variables included in the model — other than the elapsed time since the start of PSE enrolment — are categorical, and the reference group for each variable is in parentheses next to the bolded variable title. Cluster robust standard errors are in parentheses under each coefficient. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4

*Regression results: Log Earnings One Year After PSE Controlling for Completion, Census and PSIS Indicators*

| Completion Indicators | All | Graduates | Non-completers |
|---|---|---|---|
| Completion Status by Year Six (Grad) | | | |
| Non-completer | -0.47*** | | |
| | (0.040) | | |
| Time Since Start of PSE Enrolment | | | |
| | 0.093*** | 0.073*** | 0.15*** |
| | (0.0097) | (0.012) | (0.0072) |
| Completion*Time Interaction | | | |
| | 0.047*** | | |
| | (0.0075) | | |
| Census indicators | | | |
| Indigenous or Racial Identity (White) | | | |
| First Nations | -0.17*** | -0.15*** | -0.22** |
| | (0.034) | (0.039) | (0.063) |
| Métis | -0.0072 | -0.016 | 0.0024 |
| | (0.045) | (0.043) | (0.081) |
| South Asian (e.g., Pakistani, Sri Lankan) | -0.068*** | -0.051** | -0.11** |
| | (0.015) | (0.018) | (0.036) |
| Chinese | -0.11** | -0.10* | -0.11* |
| | (0.038) | (0.038) | (0.046) |
| Black | -0.17*** | -0.15*** | -0.19*** |
| | (0.017) | (0.020) | (0.034) |
| Filipino | -0.054* | -0.066 | -0.037 |
| | (0.026) | (0.034) | (0.034) |
| Latin American | -0.074* | -0.052 | -0.11* |
| | (0.030) | (0.034) | (0.047) |
| Arab | -0.18*** | -0.18*** | -0.18* |
| | (0.042) | (0.044) | (0.079) |
| Southeast Asian (e.g., Vietnamese, Thai) | -0.077* | -0.059 | -0.12 |
| | (0.031) | (0.033) | (0.061) |
| West Asian (e.g., Iranian, Afghan) | -0.15** | -0.20** | -0.079 |
| | (0.047) | (0.061) | (0.099) |
| Korean or Japanese | -0.073 | -0.031 | -0.16 |
| | (0.044) | (0.043) | (0.081) |
| Multiple or Other Identity | -0.095*** | -0.084*** | -0.11*** |
| | (0.016) | (0.021) | (0.029) |
| Home Language (English-only) | | | |
| French | 0.12*** | 0.13*** | 0.072 |
| | (0.025) | (0.023) | (0.062) |

| Completion Indicators | All | Graduates | Non-completers |
|---|---|---|---|
| Other | -0.064** | -0.070*** | -0.040 |
| | (0.022) | (0.020) | (0.045) |
| Multiple | -0.044** | -0.041** | -0.060 |
| | (0.013) | (0.012) | (0.032) |
| Immigration Generation (3rd Gen+) | | | |
| 2nd Generation | -0.053*** | -0.058*** | -0.046 |
| | (0.014) | (0.014) | (0.024) |
| 1st Generation | -0.054** | -0.062** | -0.030 |
| | (0.017) | (0.019) | (0.029) |
| Activity Limitation Dummy Variables (None) | | | |
| Seeing | -0.0024 | 0.0041 | -0.014 |
| | (0.013) | (0.017) | (0.032) |
| Hearing | 0.041 | 0.029 | 0.058 |
| | (0.032) | (0.030) | (0.061) |
| Physical | -0.16*** | -0.15*** | -0.15* |
| | (0.024) | (0.033) | (0.061) |
| Learning | -0.12*** | -0.11*** | -0.12*** |
| | (0.018) | (0.022) | (0.031) |
| Mental Health | -0.15*** | -0.097*** | -0.23*** |
| | (0.013) | (0.014) | (0.016) |
| Other | -0.093*** | -0.064** | -0.15*** |
| | (0.021) | (0.022) | (0.039) |
| PSIS Indicators | | | |
| Age at PSE Entry (Age 18) | | | |
| 16–17 | 0.0088 | 0.014 | -0.035 |
| | (0.044) | (0.038) | (0.11) |
| 19 | -0.045*** | 0.063*** | 0.0063 |
| | (0.012) | (0.013) | (0.019) |
| 20–24 | -0.0049 | -0.030 | 0.048 |
| | (0.015) | (0.015) | (0.024) |
| 25–34 | 0.14*** | 0.095*** | 0.23*** |
| | (0.028) | (0.020) | (0.061) |
| 35–54 | 0.17*** | 0.11*** | 0.34*** |
| | (0.028) | (0.024) | (0.057) |
| 55+ | -0.47* | -0.45* | -0.58 |
| | (0.19) | (0.19) | (0.36) |
| Male/Female (Female) | | | |
| Male | 0.076*** | 0.060*** | 0.13*** |
| | (0.011) | (0.0084) | (0.027) |
| CSLP Student Aid (None) | | | |
| Accessed Funding in First Year | -0.044*** | -0.031** | -0.082*** |
| | -0.0087 | -0.0093 | -0.017 |

| Completion Indicators | All | Graduates | Non-completers |
|---|---|---|---|
| Entry Cohort (2011) | | | |
| 2012 | 0.022 | 0.036* | -0.00090 |
| | -0.013 | -0.013 | -0.022 |
| 2013 | 0.040** | 0.070*** | -0.042 |
| | -0.013 | -0.014 | (0.023) |
| 2014 | 0.038* | 0.066*** | -0.031 |
| | -0.015 | -0.018 | (0.024) |
| Entry Program Level (BA) | | | |
| Certificate Program | -0.21*** | -0.32*** | -0.079 |
| | (0.033) | (0.041) | (0.041) |
| Diploma Program | -0.11*** | -0.16*** | -0.050 |
| | (0.028) | (0.040) | (0.031) |
| Entry Field of Study (Engineering) | | | |
| Education | -0.31*** | -0.34*** | -0.28* |
| | (0.051) | (0.058) | (0.11) |
| Arts | -0.48*** | -0.56*** | -0.30*** |
| | (0.040) | (0.045) | (0.047) |
| Humanities | -0.44*** | -0.53*** | -0.26*** |
| | (0.035) | (0.034) | (0.032) |
| Social Sciences | -0.34*** | -0.38*** | -0.23*** |
| | (0.030) | (0.034) | (0.031) |
| Business | -0.19*** | -0.22*** | -0.12*** |
| | (0.019) | (0.023) | (0.033) |
| Sciences | -0.35*** | -0.42*** | -0.14** |
| | (0.038) | (0.041) | (0.046) |
| Math or Computer Science | -0.11* | -0.088 | -0.13** |
| | (0.045) | (0.051) | (0.046) |
| Agriculture or Resources | -0.28*** | -0.33*** | -0.15 |
| | (0.041) | (0.041) | (0.087) |
| Health | -0.12*** | -0.14*** | -0.097* |
| | (0.032) | (0.036) | (0.039) |
| Service Fields | -0.22*** | -0.31*** | -0.042 |
| | (0.023) | (0.027) | (0.024) |
| Other or Multiple Fields | -0.16** | -0.24*** | 0.030 |
| | (0.049) | (0.044) | (0.098) |
| Intercept | 10.2*** | 10.4*** | 9.59*** |
| | (0.047) | (0.064) | (0.049) |
| Weighted Observations | 243,000 | 181,000 | 62,500 |
| $R^2$ | 0.14 | 0.11 | 0.12 |

*Note:* This table presents the weighted results of OLS models examining CIP adjusted log earnings (excluding those who earned $0) one year after a student left or graduated from a PSE program. Each column represents a separate model: an entire 2016 census sample model (Column 1); a graduate-only 2016 census sample model (Column 2); and a non-completer 2016 census sample only model (Column 3). The majority of explanatory variables included in

the model — other than the elapsed time since the start of PSE enrolment — are categorical, and the reference group for each variable is in parentheses next to the bolded variable title. Cluster robust standard errors are in parentheses under each coefficient. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.