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Exploring Postsecondary Credentials and Labour Market Alignment in Ontario

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Executive Summary

In April 2022, Ontario's Ministry of Colleges and Universities (MCU) announced an expansion of bachelor's degrees offered through public colleges to include new three-year and additional four-year programs in applied areas of study. New programs may be available as soon as fall 2022, following a quality assurance review and Ministerial Consent process administered through Ontario's Postsecondary Education Quality Assessment Board (PEQAB). The decision was aimed at improving students' access to degree-level education and enhancing graduates' job preparation. The announcement targets key sectors of the economy — health, automotive technology and infrastructure — and focuses on bachelor's degrees, carrying the implicit assumptions that there are gaps in Ontario's labour market, and that bachelor's degrees are the required remedy. This report tests these assertions by examining the alignment between Ontario's postsecondary (PSE) sector and the provincial economy. It also explores the value that key stakeholders such as employers and students assign to bachelor's degrees and other credentials, which influences enrolment and hiring decisions (serving as 'supply' and 'demand' in the labour market).

The Higher Education Quality Council of Ontario (HEQCO) undertook this study in partnership with the Social Research and Demonstration Corporation (SRDC), which provided some of the central analyses of the project. Our approach focuses on Ontario credentials to provide a high-level overview of PSE graduates' performance in the labour market. We use administrative and Key Performance Indicator (KPI) data provided by MCU and Statistics Canada's Education and Labour Market Longitudinal Platform (ELMLP) to address the following research questions: What does Ontario student enrolment and outcomes data indicate about alignment or misalignment between PSE and the labour market? What does this data reveal about the different values students and employers assign to Ontario credentials?

HEQCO uses student enrolment and outcomes data to understand the supply of graduates into the labour market; we use graduates' employment and earnings data to understand employer demand. We present trends in enrolment rates by credential (2014-15 to 2018-19); graduation rates (2014–2018); number of credentials awarded (2014–2018); employment status six months postgraduation (2013-14 to 2017-18); average third-year earnings (2011–2015 cohorts); and receipt of Employment Insurance (EI) within the first three years of graduation (2011–2015 cohorts). Credentials studied include college certificates, diplomas, advanced diplomas and bachelor's degrees, as well as university bachelor's degrees.

Our findings indicate that Ontario's current credentials are indeed aligned with labour market requirements. Domestic enrolment and graduation rates are stable across the credentials examined, suggesting that students and families continue to view them as valuable. Notably, college degree enrolment has remained flat despite a marked increase in programs offered in recent years. Both the distribution of credentials awarded across levels of education and average earnings across credentials remain consistent as well. Employment rates six months postgraduation sit well above 80%. Taken together, these indicators show that Ontario's PSE credentials are in fact meeting employer needs.

Consistent with other research related to earnings premiums by credential (Berger & Parkin, 2009; Ferrer & Riddell, 2002), our results confirm that employment outcomes vary by level of education and provider, with more positive outcomes for graduates with more advanced

credentials. On average, university degree holders earned more in their third year after graduation than college degree, diploma/advanced diploma and certificate holders. Similarly, employment rates six months after graduation vary by credential, with rates mapping onto program duration. Receipt of Employment Insurance (EI) is inversely associated with credential type; university degree graduates received EI less often within three years of graduating than graduates of college degree, diploma/advanced diploma or certificate programs.

In light of these findings, which offer a baseline for future research, we offer the following recommendations to government and PSE scholars:

- Provide clear definition and description for all bachelor's degree-types in Ontario. Three-year bachelor's degrees are a new credential in the college system and add complexity to Ontario's PSE landscape. Our analysis confirms that the value employers and students assign to credentials varies by institution, level, and program duration. With a new credential in the system, students and employers need clear information about any differences between three- and four-year bachelor's degrees, and between academic degrees and degrees in applied areas of study. Distinctions should be clearly outlined in the Ontario Qualification Framework (OQF).
- Analyze enrolment and labour market outcomes for new bachelor's degree programs. Enrolment and graduate outcomes for new, three-year college degree holders should be examined relative to other credentials to understand the demand for these programs in PSE and the labour market. Analyses should be extended to include field, industry and region.
- Focus on longer-term graduate employment outcomes for three-year degree holders to explore the value of shorter-term degrees in applied areas of study over the course of a career.
- Examine the extent to which other credentials shift in perceived value with the introduction of the new three-year college degree.

Introduction

In April 2022, Ontario's Ministry of Colleges and Universities (MCU) announced the expansion of bachelor's degrees in applied areas of study at public colleges to include new three-year and additional four-year degree programs (MCU, 2022). These degrees are expected to "help build the pipeline of job-ready graduates" needed to address perceived gaps in the province's labour needs, particularly in the automotive, health and infrastructure sectors. Expanding degrees through the college system is also designed to expand access to baccalaureate education for students in smaller and rural communities (MCU, 2022). New bachelor's degree programs will launch following an application and recommendation for Ministerial Consent, which is administered through Ontario's Postsecondary Education Quality Assessment Board (PEQAB).[1] New programs may be available as soon as fall 2022.

PSE is necessary for job readiness and career development, and all stakeholders — students and families, employers, government and institutions — expect that their investments in PSE will prepare graduates for labour market success. This report tests MCU's assertion that more bachelor's degrees are needed to address specific labour market needs. In particular, this report examines the alignment between Ontario's postsecondary credentials and the labour market, as well as the relative value students and employers assign to different credentials. The value associated with different credentials influences student enrolment decisions and employer hiring priorities.

This report also presents trends in student enrolment and graduate outcomes, which will help us understand the PSE/labour market interface. Our work follows previous research that examines Ontario's credentials and graduate outcomes (SRDC, 2015; Drewes, 2010; Walters & Frank, 2010; Wheelahan et al, 2017). HEQCO uses a broad approach, with a focus on credentials in Ontario's system rather than on program or field of study. With this focus, our report offers a view of the entire PSE credentials system rather than individual programs or disciplines. Our examination of credentials also reflects MCU's policy priorities as expressed in the degree expansion announcement.

In partnership with the Social Research and Demonstration Corporation (SRDC), which generated some of the analyses central to this project, we access the most up-to-date administrative and Key Performance Indicator (KPI) data provided by MCU and Statistics Canada's Education and Labour Market Longitudinal Platform (ELMLP). Trends in student enrolment and graduation rate by credential (2014 to 2019) provide information regarding the supply of graduates into the labour market; employment and earnings outcomes trends show the demand for Ontario credentials. We use this data to focus on the following research questions: What does Ontario student enrolment and outcomes data indicate about alignment between PSE and the labour market? What does this data reveal about the different values students and employers assign to Ontario credentials? Findings from this report offer an assessment of Ontario's current credential landscape and provide a benchmark that can be used to understand if degree expansion will shift the alignment of PSE and the labour market in years to come.

[1] All bachelor's degrees in Ontario are required to meet degree-level standards as outlined in the Ontario Qualifications Framework. With this announcement, the Minister of Colleges and Universities directed PEQAB to develop new three-year applied degree-level standards reflecting those of other bachelor's degrees.

Literature Review

Stakeholder expectations of the role and purpose of PSE have evolved over the last 50 years to reflect an emphasis on graduates' job readiness. Students increasingly report that they enroll in higher education to enhance their job prospects (Conference Board of Canada, 2016; Lauder & Mayhew, 2020) despite concerns about high tuition and debt (De Costa & Dhanani, 2021). Policymakers have focused on education and training as a response to technological changes that have shaped workforce needs (Bol et al., 2019). Employers have higher expectations that graduates will learn job-specific skills in school and have reduced training for incoming workers in response (Conference Board of Canada, 2016). This focus on PSE as an instrument of economic success has grown alongside postsecondary participation rates in Canada and globally.

In addition to degree expansion, recent Ontario government initiatives have prioritized graduates' job readiness. Institutional Strategic Mandate Agreements (SMAs) (2020–2025), for example, tie a portion of performance-based funding to graduate employment rate and earnings. In spring 2021, the Ontario government launched the Micro-credentials Challenge Fund, which provided $15M in funding to develop rapid training and upskilling programs that respond quickly to regional labour market needs. As part of the Ontario Micro-credentials Strategy, government expanded Ontario Student Assistance Program (OSAP) funding to include eligible shorter-cycle programs (OSAP, 2021a); previously, OSAP eligibility was restricted to students enrolled at 60% of a full course load in programs of at least 12 weeks (OSAP, 2021b).

Government initiatives, labour market shifts and stakeholder expectations have also incentivized Ontario's colleges and universities to focus on graduates' job preparation. Colleges emphasize their mandate for delivering applied and vocational programs, and universities have created professional programs and work-integrated learning opportunities. Both sectors point to a variety of technical and transferable skills that students gain as part of their educational programming.

The Complexities of Labour Market Needs

Understanding the relationship between PSE and the labour market is a perennial challenge (Conference Board of Canada, 2016; Richardson & Tan, 2007; Rivera et al., 2020; Weaver & Osterman, 2017). Labour market demand is difficult to predict; markets are influenced by a variety of complex forces, including changes in technology, government policy, the domestic economy and the economies of trading partners, as well as broader forces such as globalization, urbanization, automation and environmental sustainability (Richardson & Tan, 2007; Rivera et al., 2020; Organisation for Economic Co-operation and Development, 2020).

Measuring the presence and extent of skills gaps and labour market demand is similarly complex. Information about job vacancies lags behind current conditions (Lauder & Mayhew, 2020; Zimmer, 2012) and may be location- or occupation-specific (Barnow et al., 2013). The skills needed across the labour market vary by sector, occupation and location. Researchers have noted that employers and educators do not agree on the extent to which graduates are prepared for jobs and have different perspectives on the skills graduates need to be successful (Cunningham & Villaseñor, 2016).

In a 2022 report on employers' perceptions of graduate skills, the Conference Board of Canada noted that "the skills most in demand and essential for learners to master were not technical" (p. 3). Instead, employers prioritized employment readiness, as well as foundational, social and emotional skills. These *transferable* skills develop in multiple settings and through a variety of experiences, including work and education (Conference Board of Canada, 2016). Complexities associated with understanding labour market needs extend to terminology: the common terms associated with labour gaps, including "labour shortage," "skill gap," "over-qualified" and "over-skilled" have no set definitions (Barnow et al., 2013; Shields & Sandoval-Hernandez, 2020), making it difficult for stakeholders to communicate about trends and priorities. Despite the complexities of identifying and articulating labour market demands and skills gaps, government, employers and the public continue to emphasize PSE's role in addressing economic needs.

The Value of PSE Credentials in the Labour Market

Employers have limited access to information about graduates' skills, and as a result, they often rely on PSE credentials or program length as a proxy for skill development when making hiring decisions (Conference Board of Canada, 2016; Cunningham & Villaseñor, 2016; Gallagher, 2018). Many researchers have examined the relationship between credentials and labour market outcomes, describing clear links between credentials and economic success (for example, see Bills, 2003; Giani et al., 2020; van de Werfhorst, 2011; Finnie et al., 2019; Drewes, 2010; Cunningham & Villaseñor, 2016; Walters & Frank, 2010). On average, PSE credential holders earn more than those with a secondary (high school) credential, and earnings premiums increase with more advanced credentials — bachelor's degree holders earn more than certificate and diploma holders; and graduate degree holders earn more than bachelor's degree holders (Finnie et al., 2019; Statistics Canada, 2021b; Ostrovsky & Frenette, 2014).

Theoretical Frameworks Underpinning Credential Value

A variety of theoretical frameworks have been used to describe how and why credentials have value in the labour market. For instance, human capital theory posits that formal education provides knowledge and skills that have a direct influence on the productivity of workers, and employers are willing to pay for differences in productivity (van de Werfhorst, 2011; Bills, 2003; Arteaga, 2018). Shields and Sandoval-Hernandez (2019) use this framework to describe earnings as a return on investment: "the time and labour that individuals invest in their education factor into the cost of their labour … and thus result in *both* higher productivity and higher earnings" (emphasis in original, p. 112).

Screening/signalling theory offers another perspective on credential value. This theory argues that because employers lack awareness and certainty about the skills and productivity of potential employees, they use crude signals like credential level to screen workers. Higher education serves as a screening device in that it sorts workers by experience and conveys information to a purchaser of labour (Bills, 2003). The signals provided by credentials are heavily contextual. A bachelor's degree in a specific field from a specific college or university could be a positive signal for certain job opportunities and a negative signal for others (Giani et al., 2020). While human capital and screening/signalling frameworks overlap, they reflect different conceptions of PSE labour market value: in screening/signalling theory, the value of education involves reducing uncertainty for employers; in human capital theory, the value of PSE lies in developing workers' productivity levels (Shields & Sandoval-Hernandez, 2019).

Misalignment Between PSE Credentials and the Labour Market

Researchers have also focused on "mismatches" and alignment between PSE credentials and the labour market. Labour market alignment occurs when higher education institutions produce a sufficient number of graduates with the necessary skills to fulfill their career goals and meet employer needs (Cleary & Van Noy, 2014). "Sufficient number" and "necessary skills" will differ based on stakeholder priorities — rather than as an end state, alignment is best understood as a dynamic system that allows graduates and employers to obtain positive outcomes (OECD, 2020).

Mismatch or misalignment has been studied with respect to individual job seekers and their interactions with the labour market. Mismatches can be either vertical or horizontal — related to levels of education (vertical) or field of study (horizontal) (Leuven & Oosterbeek, 2011; van de Werfhorst, 2002). Both types of mismatch can negatively impact graduates' labour market success. Matching between individual credentials and the labour market can also be weak or strong (Bol et al., 2019; Roksa & Levey, 2010). For example, compared to qualifications in the social sciences, qualifications in fields such as medicine or accounting have stronger links to particular labour market outcomes. Graduates from programs with strong labour market matches often have smoother transitions into occupations; however, they are also at a higher risk of underemployment or wage loss when they are unable to find work in the fields linked to their studies. Conversely, the risk of mismatch for liberal arts graduates is relatively low (Drewes, 2010).

Employer and Student Behaviours and Labour Market Alignment

Scholars have also focused on employer behaviours when studying labour market alignment, using graduate employment rates and earnings as proxies for labour market demand (OECD, 2020; Cleary & Van Noy, 2014; SRDC, 2015). For example, Drewes (2010) used Canadian Census and National Graduate Survey data to examine employment and earnings differences of Ontario graduates by field of study (1986–2005). With growing postsecondary participation in Ontario, Drewes also explored whether Ontario was experiencing an over-supply of educated labour; the "symptoms" of oversupply in this period were declining relative wages and increased probabilities of unemployment. Drewes' study revealed that there was no evidence of over-education or oversupply of graduates in Ontario's labour market at that time.

A 2015 study by the Social Research and Demonstration Corporation (SRDC) examined labour market alignment in Ontario using indicators related to employer and student behaviours. Their research, commissioned by Ontario's Ministry of Training, Colleges and Universities (now MCU), was aimed at understanding the extent to which Ontario's overall credential mix contributed to successful student and labour market outcomes and, in turn, the province's economic productivity (SRDC, 2015, p. 1). In addition to a jurisdictional scan and interviews with key stakeholders, SRDC focused on employer demand indicators (graduate earnings, unemployment and employment in a related field) and supply indicators linked to student behaviours (enrolment, graduation rate and credentials awarded). Graduate outcomes such as earnings and employment were "valuable for assessing employer demand because employers should be willing to make more frequent employment offers and offer higher wages to graduates with skills and abilities that better meet their labour needs" (p. 130). Their analysis used 1999–2013 data, including Ministry data (graduation rates) and data gathered through graduate outcomes surveys (earnings, employment in a related field and unemployment).

SRDC's use of both employer and student-related indicators helps develop a complex picture of labour market alignment. Graduate earnings are closely linked to employer demand, but this data are also affected by supply (i.e., the number of graduates with a given credential, or credentials awarded) (SRDC, 2015, p. 131). In SRDC's study, graduation rate and credentials awarded served as proxies for supply. Both are typically seen as indicators of the extent to which students have enrolled in programs that adequately match their interests, goals and abilities. SRDC's analysis also included receipt of employment insurance as a proxy for low or unstable labour market participation — an indicator of misalignments in the labour market.

SRDC's report offers a useful model for exploring the question of Ontario's PSE and labour market alignment. This report revisits some of SRDC's central questions but with the benefit of higher-quality administrative and tax-linked data, which SRDC identified as important in enabling system monitoring and evaluation and increasing transparency in the postsecondary sector (SRDC, 2015). Following the example of an OECD (2020) study of labour market alignment, our report focuses on credentials but does not include an analysis of outcomes by field. Previous research, including SRDC's 2015 report, shows that field is linked to graduate outcomes[2] (see also Bol et al., 2019; Finnie et al., 2019; Walters & Frank, 2010; Frenette, 2019). Tax-linked data do not provide information about whether graduates are employed in the field in which they graduated. Moreover, many graduates do not have a direct occupational match to their field or work outside of the occupation for which they prepared. This is particularly the case for bachelor's degree graduates (OECD, 2020).

Research Questions and Methodology

This report focuses on the following research questions: What does Ontario student enrolment and outcomes data indicate about alignment or gaps between PSE and the labour market? Do students and employers assign different values to Ontario credentials as expressed through employment and earnings trends? In developing this report, we partnered with SRDC, which generated some of the analyses central to the project.

Methods and Limitations

This paper relies on two analyses related to graduation and employment outcomes of Ontario PSE graduates. The first analysis uses administrative and Key Performance Indicator (KPI) data provided by MCU. The second analysis, conducted by SRDC for HEQCO, uses Statistics Canada's ELMLP.

The inclusion and exclusion criteria for both analyses are broadly the same (see Table 1). The second analysis uses additional sample restrictions that will be described later. Note that we cannot interpret findings as the causal effects of specific student and/or program characteristics on any given outcome because individuals self-select into their credentials, fields of study and other aspects of their schooling. Admission requirements also vary by program, and these selection processes tend to correlate with student ability and other individual factors that have their own effects on postgraduation outcomes.

[2] Graduate earnings vary across and within fields of study. Differences within fields may be due to hours of work, industry, occupation, regional labour market trends and employment opportunities or other factors (Ostrovsky & Frenette, 2014).

Table 1

Broad Inclusion and Exclusion Criteria for Analyses 1 and 2

Inclusion Criteria

• students and graduates of Ontario credentials that are accessible directly from high school, regardless of whether students are applying directly to that program from high school:
  ○ college certificate
  ○ college diploma
  ○ college advanced diploma
  ○ college degree
  ○ university bachelor's degree

Exclusion Criteria
• students and graduates of Ontario collaborative nursing degrees[3] • students and graduates of Ontario credentials that require completion or near-completion of another postsecondary credential for admission (i.e., college graduate certificates, professional programs like law or medicine, and graduate programs like master's and doctoral degrees)

Analysis 1: Ontario MCU Administrative and KPI Data

We used STATA 17 to conduct descriptive statistics on administrative and KPI data provided by MCU. Both the administrative data and the KPI survey data[4] are collected by institutions and aggregated by MCU. The administrative data included fall headcount enrolment and graduate counts. The KPI data included graduation[5] and graduate employment[6] rates. For all credentials of focus, we present results for the most recent years where data are available, with the results of domestic and international students portrayed together unless otherwise indicated.

Analysis 2: ELMLP

SRDC used the ELMLP to analyze the average annual earnings of Ontario postsecondary graduates. The ELMLP is a relational data environment that securely and anonymously links

[3] We excluded Ontario collaborative nursing degrees from the analyses because the level of data aggregation permitted the identification of these programs, students and graduates. Moreover, these programs differ from the other college degrees offered in the province in that they are jointly administered by college-university partnerships.
[4] College KPI data are collected via the College Graduate Outcomes Survey, which is conducted three times a year by phone, and the Student Satisfaction Survey, which is conducted in classes in early February. The College Graduate Outcomes Survey asks college graduates about their success finding work, and if graduates consent, surveys their employers. Each of the three survey windows targets graduates of a particular semester. University KPI data are collected via the Ontario University Graduate Survey, which is administered to all graduates two years after graduation and asks for information on their employment outcomes at six months and two years after graduation. The KPI surveys are voluntary, which means that we cannot rule out the possibility of self-selection and non-response bias in the samples. Please see Appendix A for the response rates for both KPI surveys for the years of focus.
[5] Graduation rates are shown as the percentage of program entrants who graduated within approximately 200 percent of their program's regular duration, or seven years for college and university bachelor's degree graduates. For example, students enrolled in a one-year certificate program have a two-year window to complete their program to be included in the graduation rate. See Ontario MCU, https://www.app.tcu.gov.on.ca/eng/labourmarket/employmentprofiles/FAQ.asp#anc11;and https://www.app.tcu.gov.on.ca/eng/labourmarket/employmentprofiles/glossary.asp#G.
[6] The ministry calculates the graduate employment rate as the proportion of graduates in the labour force who responded as being employed or offered employment. The labour force is defined as those who are employed, offered employment or looking for work but not in school. The employment rate plus the unemployment rate should equal 100%. See Ontario MCU, https://www.app.tcu.gov.on.ca/eng/labourmarket/employmentprofiles/glossary.asp.

multiple administrative datasets held by Statistics Canada.[7] The ELMLP allows researchers to generate longitudinal information as individuals progress through PSE, graduate and enter or re-enter the labour market following their schooling. The platform has three core components: the Postsecondary Student Information System (PSIS), the Registered Apprenticeship Information System (RAIS) and the T1 Family File (T1FF). This report focuses exclusively on PSE, so we use only PSIS and T1FF for the analysis.[8]

PSIS consists of the annual enrolment and graduation records of publicly funded colleges and universities across Canada from 2009 to 2017.[9] T1FF captures individual-level information from annual personal income tax returns and family-level information on household composition.[10] T1FF information is available for all individuals with PSIS records on the ELMLP from 1992 to 2018. Depending on when a student first enrolled, this may include the years before, during and following PSE.

Sampling[11]

We present results that examine the average annual income earnings of the 2011, 2012, 2013, 2014 and 2015 graduating cohorts for their first three years post-graduation. We use PSIS to identify the graduate cohorts, credentials of focus and graduate demographic characteristics[12] while we use T1FF to identify graduate employment, annual income and uptake of Employment Insurance (EI), as well as whether graduates continued onto further education.[13] Table 2 displays the period for which T1FF earnings were tracked for each cohort.

[7] See Statistics Canada, 2021, Overview of the Education and Labour Market Longitudinal Platform (ELMLP) and Associated Datasets.
[8] These datasets have different reporting cycles: T1FF uses calendar year, whereas PSIS uses a May to April reporting cycle. There is no ideal way to reconcile these different reporting cycles. Considering the large majority of graduation takes place between May and August, we simply interpret the PSIS reporting cycle as if it was the calendar year in which it commences.
[9] While PSIS is closer to a census of all PSE students than a sample, not all postsecondary institutions provide information for all PSIS data elements or through the entire period covered. In fact, enrolment and graduation records for almost half of Ontario colleges are missing from PSIS before the 2013-14 reporting cycle. The number of colleges with missing information varies from year to year, but this report includes all available records in PSIS rather than restricting the sample to institutions that reported enrolment and graduation records for all reporting cycles. Information in PSIS includes students' program information (e.g., type of credential, Classification of Instructional Program [CIP] code, program name), institution type and location, as well as student characteristics (e.g., age, sex, immigration status, and current and permanent address) (Statistics Canada [n.d.], PSIS Codebook; see also Statistics Canada, 2021, Persistence and graduation indicators of postsecondary students, 2011/2012 to 2018/2019).
[10] T1FF provides insight into yearly income from various sources, including employment and self-employment income, income from government programs (e.g., Social Assistance, Employment Insurance and the Child Tax Benefit), and various tax credits and deductions (e.g., PSE tax credits, union dues). See Statistics Canada, 2021, T1 Family File, Final Estimates, 2019.
[11] See Appendix B for sample characteristics
[12] PSIS captures graduation through indicators that represent program end status and graduation date. Because PSIS includes an enrolment record for each program, a single student may have multiple programs associated with their ID. For students reported as having graduated from multiple programs in a given year, SRDC used Statistics Canada's recommended process for ensuring only one record per graduate for a given cohort (Statistics Canada, 2018b), but privileged Ontario-based credentials before applying random selection to break any ties. Because the period observed in the data is fairly short, this study does not control for prior PSE enrolment or graduation.
[13] The T1FF-derived further education indicator is captured using any positive full-time education deduction or months of full-time PSE study reported from the first full year following graduation up to the end of the third year. The full-time education deduction (EDUDN) is available on T1FF until 2016 only. The variable months of full-time PSE study (NMTFLTSE), reported on T1FF starting in 2017, is used from that point onward. The T1FF does not capture level of PSE enrolment.

Table 2

Graduating Cohorts and Tracking Period, ELMLP, Analysis 2

Graduating Cohort	2011	2012	2013	2014	2015	2016	2017	2018
2011 cohort	X							
2012 cohort		X						
2013 cohort			X					
2014 cohort				X				
2015 cohort					X			
X = graduating year			= years observed in the tax data (T1FF) for each cohort.					

As with the first analysis, we include only graduates of Ontario college certificate, college diploma, college advanced diploma, college degree and university bachelor's degree programs. Due to the limitations of the PSIS dataset, we treat college diploma and advanced diploma programs as a single credential group though they are separate credentials with different durations (two and three years, respectively).

Graduates who continued on to another full-time postsecondary program within the three-year tracking period were excluded.[14] This restriction was imposed because further training or schooling typically leads to less active engagement in the labour market, and new skills or credentials acquired following new training or returning to school could lead to new earnings patterns upon labour market re-entry. We also excluded graduates who did not file taxes in the third year following graduation.

These restrictions left the SRDC with a sample of 375,600 graduates for analysis.

Measures

Earnings

Average income in the third year post graduation was tabulated using total before-tax employment earnings, which combines all paid employment income (wages, salaries and commissions) reported on T4 slips, positive net income earned from self-employment (business, professional, commissions, farming and fishing), Indigenous-exempt employment income and other taxable employment income not reported on a T4 slip, such as tips, gratuities and net research grants. Earnings were CPI-adjusted to match the last year of tax data available (i.e., 2018).

EI Receipt

The receipt of EI, documented by T1FF, can serve as a proxy for likely unstable employment or low labour market participation. Results should be interpreted carefully in light of the fact that

[14] The further schooling sample restriction used specifically for the labour market outcomes relies on the T1FF education indicator rather than subsequent enrolment records in PSIS. SRDC opted for T1FF for four reasons: 1) because T1FF covers a longer period than PSIS, which allows us to include the 2015 cohort of graduates; 2) T1FF data identifies more individuals pursuing education than PSIS; therefore, it potentially captures most graduates who go back to school (see the Further Education section); 3) the restriction does not require PSE level breakdowns; and 4) the education restriction would come from the same source as the labour market outcome (i.e., the tax data), thereby removing the need to deal with period mismatch in T1FF (calendar year) and PSIS (reporting cycle May to April).

receiving EI income could be the product of a variety of labour market demand- and supply-side decisions, including short- and long-term layoffs, parental leave, sick leave and specific industry or regional decline in employment opportunities.

Data Presentation and Analysis

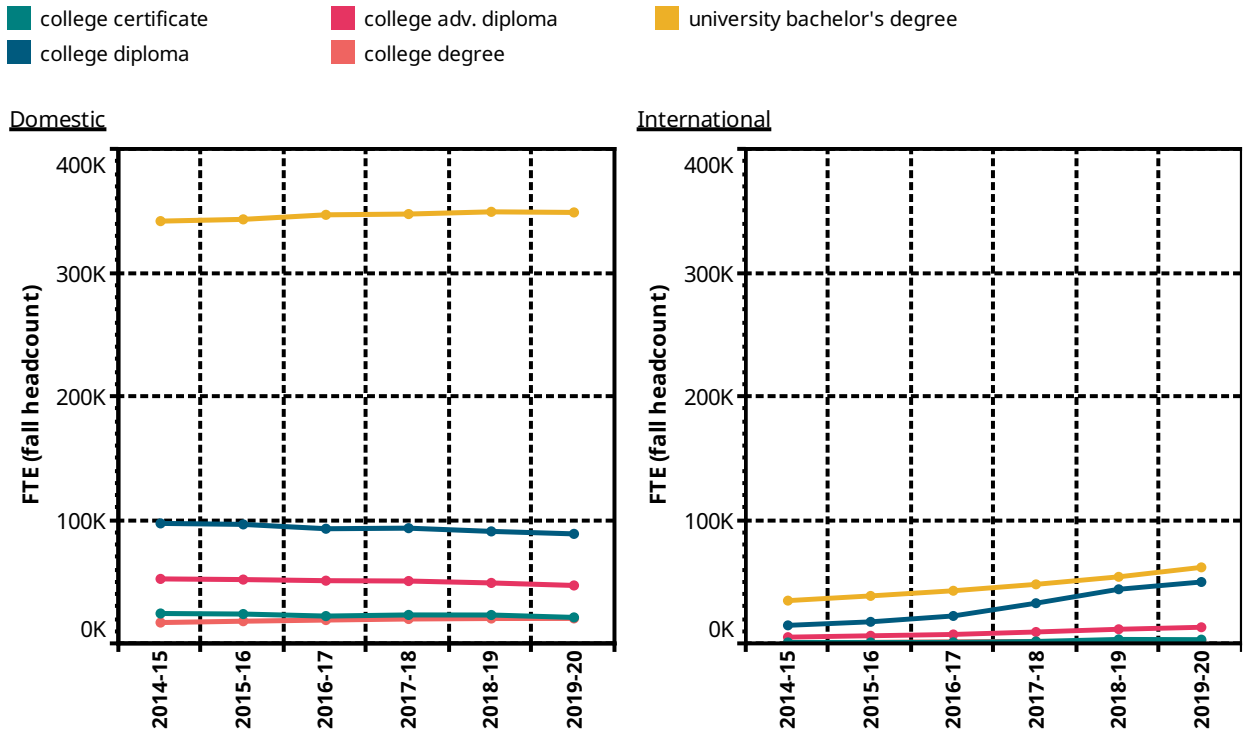
Ontario Enrolment Trends

PSE participation rates in Ontario and Canada are among the highest in the world. As of 2022, 68% of Ontarians between the ages of 25 and 64 have a postsecondary credential — this is the highest PSE attainment rate in Canada (Statistics Canada, 2022a) and much higher than the OECD average of 44%. Students entering PSE in Ontario have a broad range of credential and program options available across the sector. Table 1 outlines the five credential types included in this analysis; these are defined in the Ontario Qualifications Framework (OQF), a tool intended "to assist employers in determining the fit between their needs and what can be expected" of graduates (MCU, n.d.).

Figure 1 shows enrolment trends for Ontario university and college credentials from 2014-15 to 2019-20.

Figure 1

Domestic and International Enrolment Trends in Ontario College and University Programs Accessible Directly from High School, 2014-15 to 2019-20



Source: MCU, fall headcount enrolment.

Note: College degree records exclude collaborative nursing degree programs.

As Figure 1 indicates, domestic enrolment numbers in credential have been relatively stable in recent years. Researchers have posited that a levelling of domestic enrolment may be related to already-high participation rates in Ontario and/or declines in the cohort of 18–24-year-old Ontarians (Fallis, 2013). In Ontario, domestic enrolment is also shaped by enrolment corridors, which are a central feature of the government's current funding formula, introduced in 2017-18 (Ministry of Advanced Education and Skills Development, 2017). Under this formula, institutions are not incentivized to increase domestic enrolment above the corridor threshold, as no additional funding is provided for domestic enrolment excesses.

In the college sector, enrolment in four-year bachelor's degree programming is restricted. Before government's recent announcement on the expansion of college degree-granting, most colleges could offer up to 5% of their overall programming at the bachelor's level, whereas institutions designated as Institutes of Technology and Advanced Learning (ITAL)[15] could offer up to 15% of programming at the bachelor's level. With the coming expansion, degree-programming caps have increased to 10% for most colleges and 20% for ITALs.

Since colleges were authorized to award bachelor's degrees in 2000, the number of college degree programs has steadily increased. Currently, 177 degree programs are offered across 16 Ontario colleges. Nearly 70 new programs have been launched in the past six years.[16] However, degree program enrollment across the college sector has remained relatively flat since 2014 and for the most part below the existing programming caps. Four colleges (two designated as ITALs and two CAATs, or Colleges of Applied Arts and Technology) are at or above their bachelor's degree caps. All other colleges are well below their caps. Note that college degree caps are not based on enrolment; rather, they focus on institutional programming proportions. As enrolment trends indicate, adding new degree programs may not result in dramatic enrolment increases.

The limited growth of Ontario college degree enrolment may reflect the tensions and challenges Wheelahan et al. identified in their 2017 study of the impact of college bachelor's degrees on students and institutions. College students described pragmatic and cultural challenges associated with pursuing a degree at an Ontario college instead of a university. For example, despite the fact that bachelor's degrees have been offered at Ontario colleges for more than 20 years, they are "not well understood by employers, the community or potential students" (p. 8). Students also expressed concerns about public perceptions regarding college degrees — that they have different status than university degrees, a reflection of the hierarchical structuring of higher education.

International enrolment patterns in Ontario are quite different. As Figure 1 indicates, enrolment in two-year college diploma and university degree programs has increased significantly in the past five years. In 2019-20, international students represented 16% of university enrolments, up from 11% in 2015-16. From 2015-16 to 2019-20, international college enrolments increased from 12% to nearly 30% of total college enrolments (Statistics Canada, 2021b).

International enrolment has increased due to additional opportunities for international students to remain in Canada after graduation under the Post-Graduate Worker Permit Program (PGWPP). This allows one to three years of temporary immigration status. Institutions have

[15] Five colleges are designated as ITALs: Conestoga, George Brown, Humber, Sheridan and Seneca
[16] In 2016, 13 colleges offered 108 baccalaureate programs (Wheelahan et al, 2017)

used international enrolment to increase revenues, a strategy that followed years of funding insecurity and a 10% domestic tuition cut and freeze in 2018.

Enrolment trends provide important context for understanding Ontario's credential landscape. Labour market dynamics affect students' decisions about which credentials to pursue (Rios-Aguilar et al, 2018). These trends offer a glimpse into students' and families' perceptions of future opportunities in the labour market. While consistency in enrolment across credentials is, in part, a result of government policy, it also indicates that students and families continue to view them as valuable.

Enrolment trends include students across all program years; graduation rates and credentials awarded offer a clearer picture of who is entering the labour market. Graduation rate trends are shown in Table 3.

Table 3

Average Ontario Graduation Rate by Credential, 2014-18

Mean Graduation Rate	2014	2015	2016	2017	2018	Average
college certificate	70.7%	71.2%	71.1%	70.4%	67.6%	70.2%
college diploma	65.7%	65.4%	65.8%	66.4%	65.9%	65.8%
college advanced diploma	63.2%	63.0%	65.2%	64.9%	62.4%	63.7%
college degree	67.9%	72.4%	67.1%	69.2%	68.0%	68.9%
university degree	71.8%	71.0%	70.2%	70.3%	70.2%	70.7%

Source: MCU, Key Performance Indicators.

Note: College degree records exclude collaborative nursing degree programs. Both domestic and international graduates are included. MCU calculates graduation rate in terms of the number of students who graduate a program within 200% of the standard program length (for programs less than four years) or within seven years of entry (for four-year degree programs).

Ontario graduation rates are relatively consistent over time and roughly align with Canadian averages, listed here: university graduation rates, 73%; diploma graduation rates, 57%; college certificate graduation rates, 64% (2019 averages, Usher, 2021). College graduation rates included in Table 3 are also consistent with SRDC's 2015 findings[17] (SRDC, 2015, p. 31). The university degree graduation rate reported by SRDC (2015) was 77%, which is somewhat higher than more recent rates.

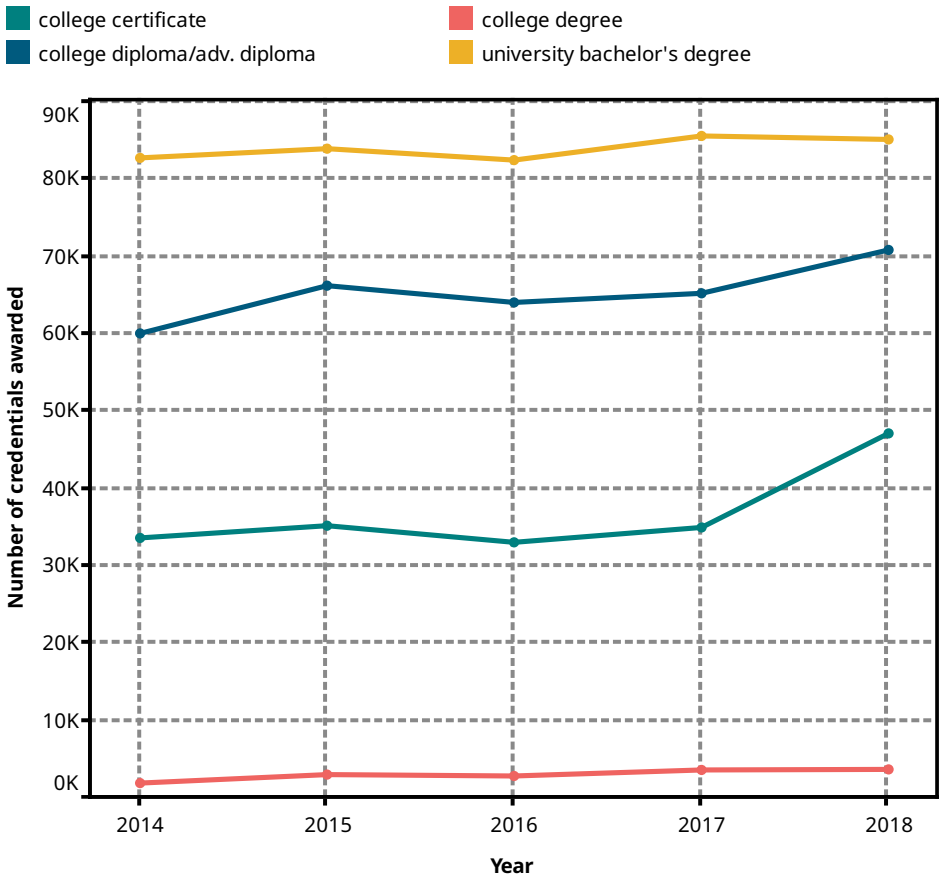
University graduation rates vary widely across the province's 21 institutions. On average, 2018 graduation rates for Ontario's research-intensive universities (also known as U6 universities) are higher than non-research-intensive universities (79% versus 66.5%). College bachelor's degree graduation rates are consistent across institution types: 2018 ITAL bachelor's degree graduation rates were 68% versus 69% for other colleges. The number of bachelor's students enrolled in and graduating from ITAL colleges is considerably higher than those for other colleges. ITALs also offer far more degree programs.

[17] SRDC's report (2015) includes college graduation rates measured in 2012 and university graduation rates measured in 2011.

Credentials awarded provides further information about the supply of graduates into the labour market. Figure 2 reveals how, from 2014 to 2018, the supply of credentials included a relatively consistent mix of graduates across levels/years of schooling. College and university degrees have remained relatively flat across five years, whereas the number of college diplomas and certificates awarded has increased more dramatically.

Figure 2

Number of Credentials Awarded, Ontario, By Credential, 2014-18



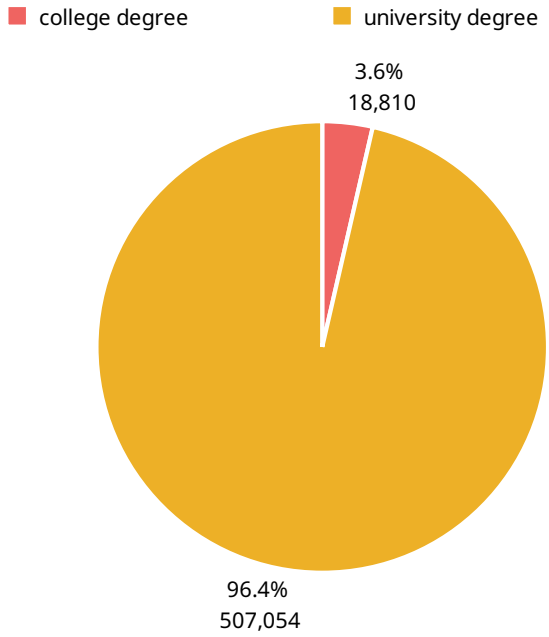
Source: Statistics Canada. Table 37-10-0087-01. Postsecondary graduates, by credential type, age group, program type and gender. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3710008701

Note: The program type variable used to exclude college graduate certificates, university diplomas and certificates, and graduate degree programs. Both domestic and international graduates are included.

Figure 3 illustrates the proportion of bachelor's degrees awarded by universities and colleges, with the vast majority of Ontario bachelor's degrees being awarded by the university sector. Between 2014 and 2019, college degrees accounted for 4% of total degrees awarded. The limited growth of college degree enrolments and graduates reflects the fact that university degrees are still considered more mainstream in Ontario (Wheelahan et al., 2017).

Figure 3

Total College and University Bachelor's Degrees Awarded, Ontario, 2014-19



Source: Statistics Canada. Table 37-10-0087-01. Postsecondary graduates, by credential type, age group, program type and gender. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3710008701

Note: Both domestic and international graduates are included.

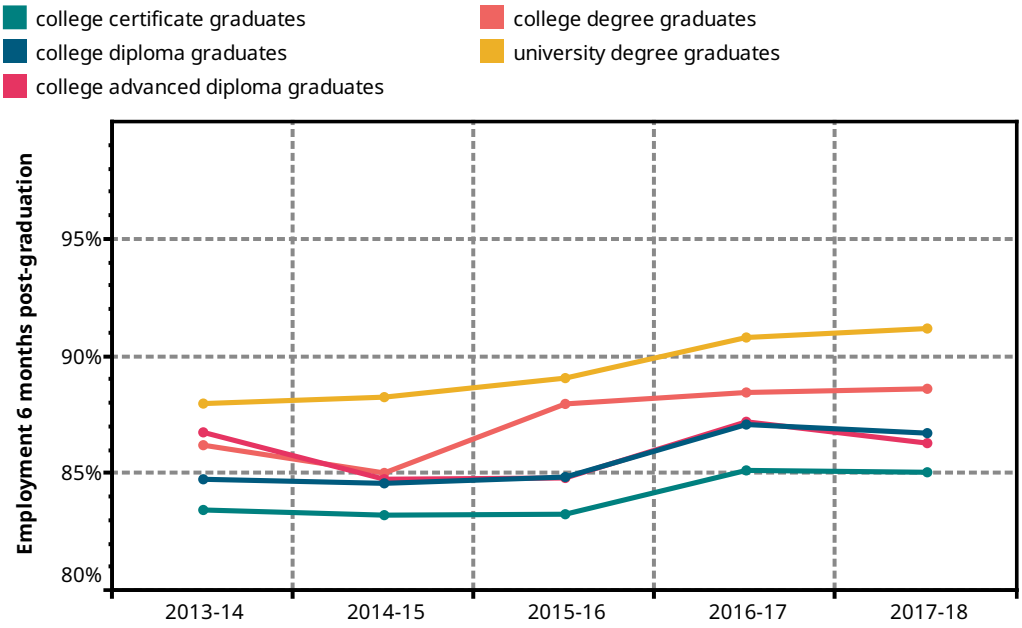
Taken together, enrolment rates, graduation rates and the types of credentials awarded provide essential information about student behaviours and attitudes and the supply of graduates who enter the labour market each year. Enrolment and graduation data reflect students' interest in and commitment to their program of studies (SRDC, 2015). Students make important decisions about program and institution type during the admissions process according to their academic and career interests; they persist to graduation in part because of their perceptions of the specific definition and value of credentials. Their decisions are strategic; students understand that PSE credentials differentially enhance graduates' employability according to the skills and expertise they develop in their chosen program of studies.

Employment and Earnings

We can further understand labour market alignment by considering employment and earning trends across different credentials. Employment and earnings data reveal employers' perceptions regarding the value of credentials, as well as the match between their needs and what new graduates have to offer. If employers' needs are not being met by the supply of graduates, or if there are more graduates than employers need, employment rates would show a decreasing trend line. Ontario graduates' employment rates shown in Figure 4 illustrate the opposite: a slight acceleration over time, suggesting that the supply of graduates is not exceeding demand and graduates are in fact meeting the needs of the labour market.

Figure 4

Employment Six Months Post-graduation, 2013-14 to 2017-18



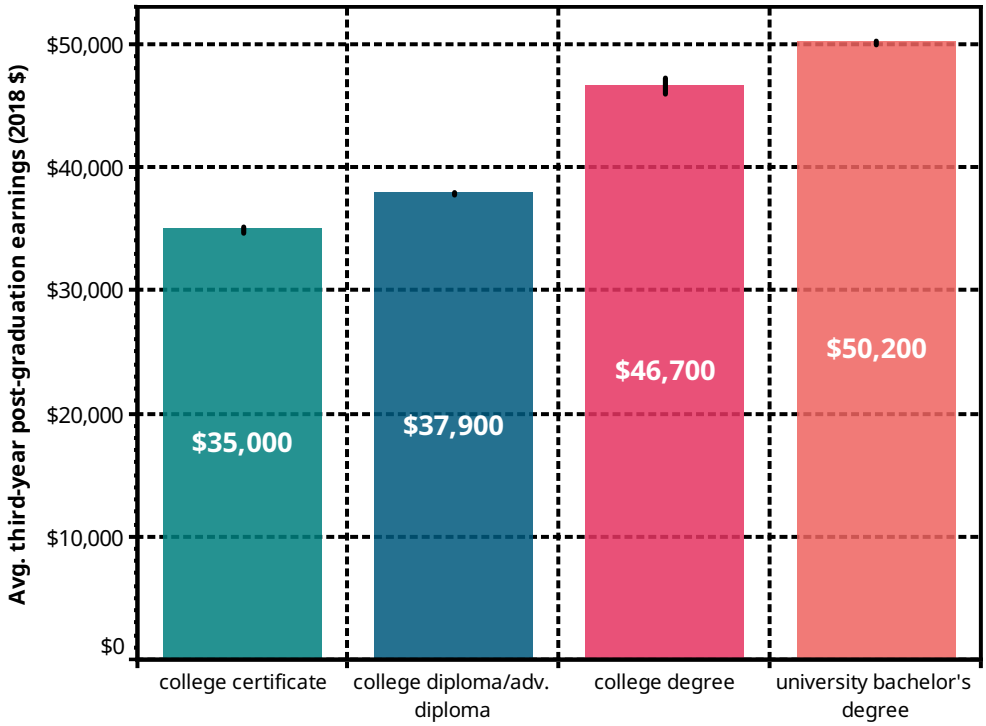
Source: Ontario MCU, Key Performance Indicators.

Note: College degree records exclude collaborative nursing programs. Both domestic and international students are included.

Employment rates for all credentials is relatively consistent over the period included for this analysis, and employment rates are well above 80%, with rates trending higher for more advanced credentials. These findings are consistent with previous research (SRDC, 2015; Bol & van de Werfhorst, 2011), which indicates that graduates with more education are better positioned in the labour market than those with less advanced credentials. In general, the labour market favours degree holders over diploma and certificate holders, as indicated by higher employment rates and earnings. Annual earnings are presented in Figure 5.

Figure 5

Average Third-Year Post-graduation Earnings by Credential, Ontario, 2011-15 Graduating Cohorts (2018 Dollars)



Source: Statistics Canada, PSIS-T1FF.

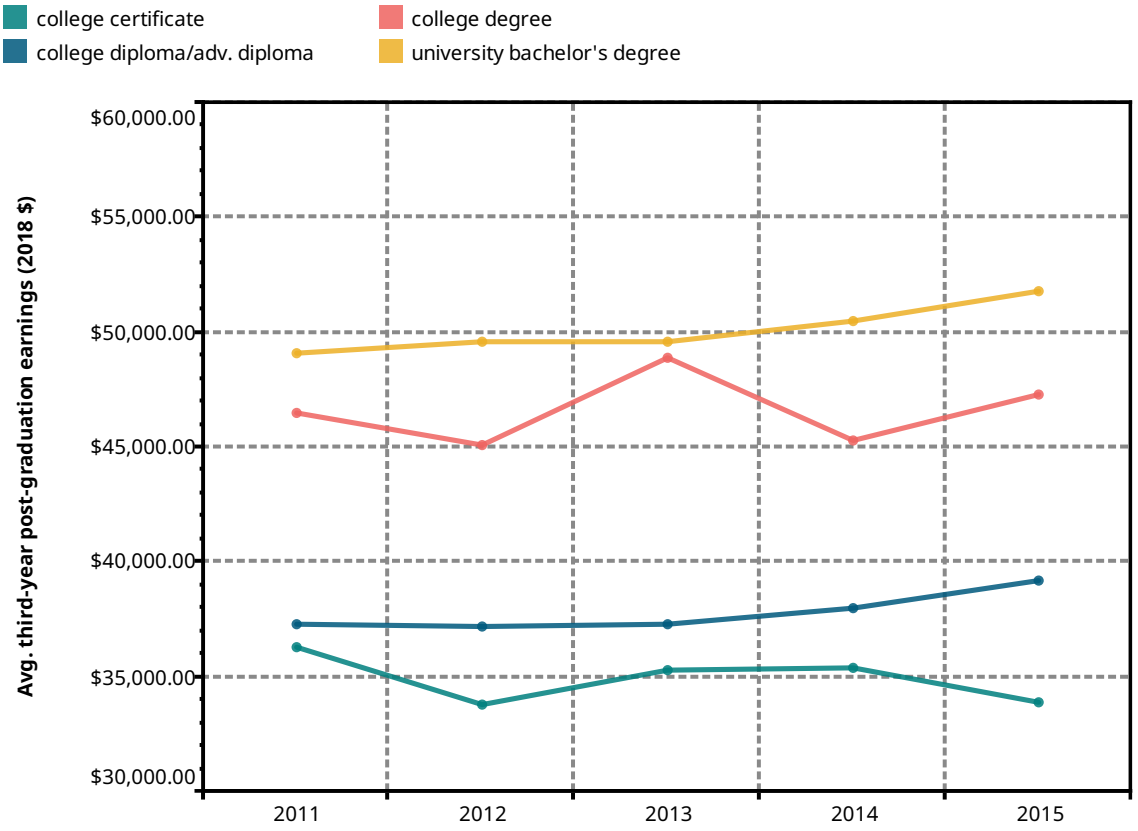
Note: College degree records exclude collaborative nursing degree programs. Both domestic and international graduates are included. Individuals who did not file taxes in their third year post graduation and/or pursued further education after graduating from their first postsecondary credential are excluded.

As Figure 5 indicates, the labour market is sensitive to different credentials and awards premiums according to credential level and institution type. On average, Ontario university degree holders earn $3,500 more per year than college degree holders, who in turn earn an average of $8,800 more per year than diploma holders. These findings correspond with previous studies that have explored the earnings premiums associated with degrees (Finnie et al., 2019; Drewes, 2010) and indicate an increased return on investment associated with credentials requiring longer duration to completion and greater complexity of knowledge.

Figure 6 shows graduates' earnings by credential over time.

Figure 6

Average Annual Earnings Three Years Post-graduation by Credential, Ontario, 2011-2015 Graduating Cohorts (2018 Dollars)



Source: Statistics Canada, PSIS-T1FF.

Note: College degree records exclude collaborative nursing degree programs. Both domestic and international graduates are included. Individuals who did not file taxes in their third year post graduation and/or pursued further education after graduating from their first postsecondary credential are excluded.

When employers experience difficulty in recruiting qualified personnel, average earnings are likely to increase — new employees can command a higher salary because their skills are in short supply. An over-supply of graduates would result in declining average wages and employment rates (Drewes, 2010). Figure 6 indicates that from 2011 to 2015, earnings were stable within each credential category (certificate, diploma/advanced diploma, college degree and university degree). Earnings stability over time indicates strong alignment between the supply of credentials and employers' needs (Cappelli, 2014; Ferrer & Riddell, 2002; Drewes, 2010).[18]

[18] Note that average salaries by credential may show stability despite volatility across sectors, with increases in some sectors offset by decreases in other parts of the market.

Graduates' Use of Employment Insurance

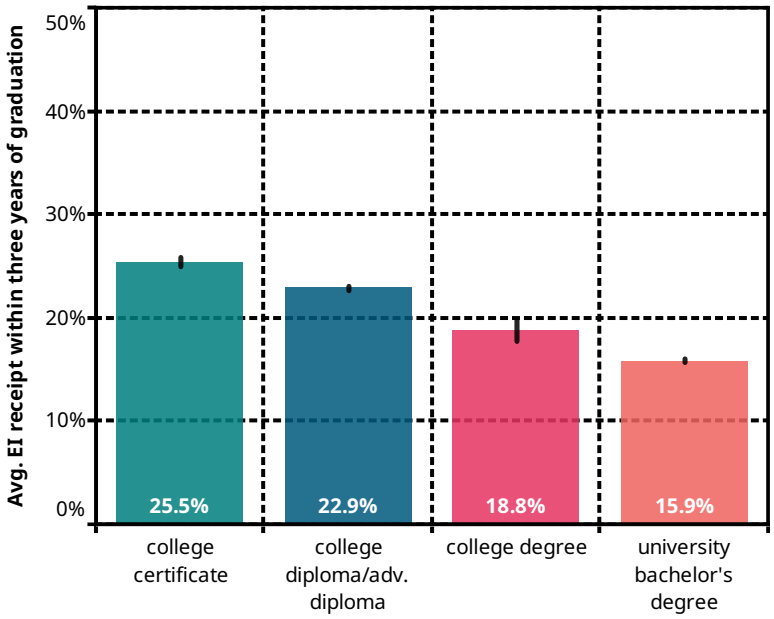
To further explore employment stability for graduates included in this analysis, we also present average Employment Insurance (EI) rates of receipt between 2011 and 2015. This indicator does not map directly onto unemployment rates; rather, it serves as a proxy for challenges recent graduates experienced in their first three years after graduation. EI receipt depends on well-defined eligibility: by definition, all graduates who access EI participated in the labour market before accessing support; individuals must have worked at least 420 insurable hours (approximately 12 weeks) in the past year or since the start of their last EI claim. Those who access EI may also have worked on a short-term contract following graduation, or on a series of contracts; they may have secured a job but were laid off or are taking a parental leave. They may also be struggling to find a job in their chosen field.

Unemployment rates for the graduates included in this analysis are not available.

[19] Though only a proxy for unemployment, EI rates offer some insight into the employment stability of these graduates. Figure 7 shows that rates of EI receipt inversely map onto employment rates included in Figure 4. On average, employment instability decreases with higher levels of education. This trend is consistent over the years included in this analysis.

Figure 7

Average Rate of EI Receipt Within Three Years of Graduation, by Credential, Ontario, 2011-15 Graduating Cohorts



Source: Statistics Canada, PSIS-T1FF.

[19] Though the Labour Force Survey and the Census can provide high-level information on individuals' employment status and educational attainment, these datasets do not presently capture educational attainment at a sufficiently granular level to study graduate employment and unemployment in relation to their specific levels of study and time since graduation. PSIS-T1FF, being a combination of administrative postsecondary data and tax filings, contains most of the requisite educational attainment data but does not capture graduate employment or unemployment. Though the instruments used to measure KPIs by MCU (the College Graduate Outcomes Survey and Ontario University Graduate Survey) do collect information related to graduate employment and unemployment, they report the rates in terms of the survey respondents rather than the graduating cohort more broadly.

Note: College degree records exclude collaborative nursing degree programs. Both domestic and international graduates are included. Individuals who did not file taxes in their third year post graduation and/or pursued further education after graduating from their first postsecondary credential are excluded.

Conclusions and Recommendations for Future Research

Ontario institutions offer a range of postsecondary credentials with distinct occupational pathways and points of entry into the labour market. Our analysis shows that Ontario's broad mix of credentials is aligned with current labour market needs. This alignment is evident in stable enrolment and graduation rates across credentials, which indicate that students perceive that Ontario credentials do have value and will improve their job prospects. Stable employment rates and average earnings also show that the supply of Ontario graduates is meeting the demands of employers.

Evidence from this analysis indicates that government's degree expansion initiative is not required to support employers needs. However, since the new policy is already in place, researchers and policy makers should turn their attention to its potential impacts on students, employers, institutions and government in years to come. New three-year degrees in applied areas of study will add complexity to Ontario's credential landscape and may shift graduate outcomes and the perceived values of other credentials.

In the current context, credential values generally correspond with program duration — this can be taken as a proxy for knowledge (breadth and depth) and skill development. Credentials are understood in relationship to one another and as distinct learning opportunities; unavoidably, credentials sit in comparison to other credentials. For example, an advanced diploma is understood to offer more specialized knowledge than a certificate program, but less breadth and depth of knowledge than a bachelor's degree. The value attributed by stakeholders to various credentials is expressed and reinforced through enrolment patterns and graduate labour market outcomes.

Accordingly, new three-year bachelor's degrees will be understood in relationship to four-year bachelor's degrees offered by colleges and universities. In the current context, employers generally assign a higher value to university bachelor's degrees than four-year college degrees. New three-year college bachelor's degrees will likely carry lower value than *both* college and university four-year degrees. New three-year degrees in applied areas of study will also differ, in terms of curriculum and program structure, from existing degree programs. Potential students need to understand any differences — in curriculum and perceived value — between three- and four-year colleges degrees, as well as college and university degrees, so that they can make informed decisions that will influence their future career paths. Employers also need to understand the skills and competencies associated with different credentials, including any differences between bachelor's degree types. This leads us to our first, and arguably most important, recommendation: that government should ensure that the Ontario Qualifications Framework is updated to provide more clear and complete information about different bachelor's degrees.

As the new degree programs are introduced in Ontario, researchers should re-examine credential-level enrolment, graduation and labour market outcomes to understand any impacts introduced by degree expansion. These results will serve as a baseline for future research. Researchers should extend this analysis to explore labour market alignment by credential, field,

industry and geographic region. This information can then be used to refine future government initiatives in support of Ontario's labour market needs.

Researchers should also focus on outcomes associated with three-year degrees. For example, researchers should analyze longer-term employment rates and earnings for three-year degree graduates. Graduates from highly specialized applied programs are more at risk with respect to matching with employer needs; employment rates may be volatile for these graduates. Longer-term employment outcomes will reveal the value of three-year degrees in positioning employees for both job stability and promotion. This information will be important for students as they consider PSE opportunities and make decisions about their career paths.

In addition to understanding the employment and earnings outcomes for three-year applied degree holders, it is important to examine how new degrees shape outcomes for all credential types in Ontario's landscape. Ontario credentials are embedded in a system, and shifts in the value of one credential type may impact the value of others. Over time, shifting values will shape student application and enrolment decisions.

Ontario has among the highest postsecondary participation rates in the world and employment and earning outcomes are strong for graduates across credential types. Innovation and program development within the existing credential framework has served the province's economy well. Findings from this report offer reassurances about the current credential system, but also raise questions about how new complexities will shape Ontario's credential landscape in the future. Clear answers and information about all credentials are essential for stakeholders in Ontario's labour market, including students, families, institutions and employers.

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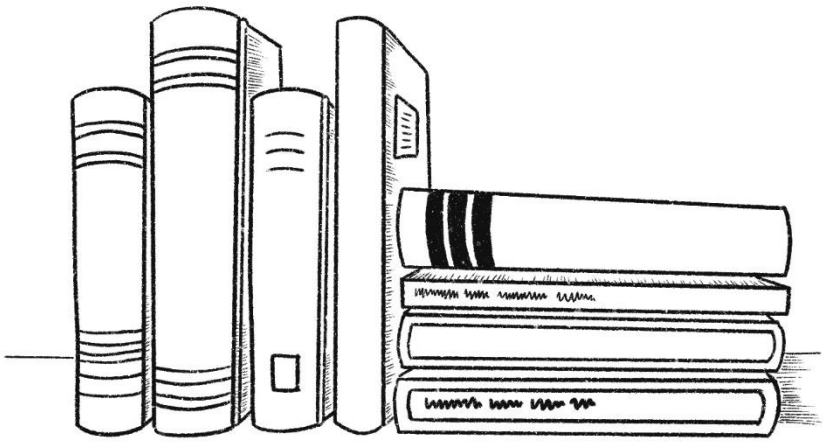

Exploring Postsecondary Credentials and Labour Market Alignment in Ontario

Appendices

Appendix A: Ontario College and University KPI Survey Response Rates, 2013-14–2018-19 Academic Years

College Graduate Outcomes Survey

Reporting Year	Academic Year	Response Rate
2014-15	2013-14	66.0%
2015-16	2014-15	58.4%
2016-17	2015-16	51.8%
2017-18	2016-17	60.1%
2018-19	2017-18	65.4%
2019-20	2018-19	49.0%

Ontario University Graduate Survey

Reporting Year	Academic Year	Response Rate
2015-16	2013-14	40.7%
2016-17	2014-15	38.4%
2017-18	2015-16	35.3%
2018-19	2016-17	34.5%
2019-20	2017-18	34.5%
2020-21	2018-19	35.2%

Source: MCU

Note: Both domestic and international graduates are included. MCU calculates graduate response rate as the total number of completed interviews divided by the total number of valid graduate numbers

Appendix B: Sample Characteristics, 2011–2015 Graduating Cohorts, Ontario (Analysis 2)

Sample Characteristics	college certificate	college diploma/adv. diploma	college degree	university bachelor's degree
n	78,760	234,180	7,840	378,240
female	58.4%	54.0%	56.9%	59.2%
international students	7.1%	14.0%	7.1%	6.0%
24 or younger	59.9%	60.2%	58.0%	76.3%
25 or older	40.1%	39.8%	41.8%	23.7%

Source: Statistics Canada, PSIS-T1FF.

Note: College degree records exclude collaborative nursing degree programs. Individuals who did not file taxes in their third year post graduation and/or pursued further education after graduating from their first postsecondary credential are excluded.