The Education Longitudinal Linkage Platform (ELLP): Linking Data for Insights into Student Pathways and Graduate Outcomes

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Centre for Education Statistics
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Outline

- Motivation for the creation of a postsecondary education linkage platform
- The Education Longitudinal Linkage Platform (ELLP)
- Education linkage vision
- Preliminary results
- Moving forward
Motivation for the creation of a postsecondary education linkage platform

- Strengthen the relevance of programs for our clients
- Meet increasing demand by stakeholders to fill in important data gaps
- Align with Statistics Canada's vision for bringing data together and reducing the burden on Canadians
- Be ready to provide timely data when it is needed
More specifically for both PSE students and apprentices...

- **Pathways**
  - Persistence rate and graduation/completion rate
  - Transition between PSE programs (including college, university, apprenticeship)
  - Interprovincial mobility during education/apprenticeship and on completion

- **Outcomes**
  - Evolution of earnings over time (median)
  - Average earnings comparisons could be done among program types, fields of study/trades, cohorts or by demographic characteristics
  - Interprovincial mobility of graduates/apprentices on the labour market
Education Longitudinal Linkage Platform (ELLP)
Programs at the core of the Education Longitudinal Linkage Platform

- The Postsecondary Student Information System (PSIS) is a administrative data holding of all public college and university enrolments and graduates by program / credential type and field of study for each school year.

- The Registered Apprenticeship Information System (RAIS) is an administrative database of pan-Canadian, annual data on registered apprentices and trade qualifiers. It compiles data on registered apprentices receiving training and on persons that obtain certification in trades where apprenticeship training is offered.
Education Longitudinal Linkage Platform (ELLP)

- The ELLP consists of a repository of linkage keys for records in PSIS and RAIS.
- The linkage keys can be used to extract selected variables from PSIS and RAIS to create longitudinal linked files for analysis. These administrative linked files can then be linked with other data sources (administrative or survey) to increase analysis potential.
- The ELLP is NOT a linked data file.
Creation of datasets to:
• develop education indicators
• answer research questions
• help with program evaluation

RAIS: Registered Apprenticeship Student Information System
T1FF: Tax 1 Family File
PSIS: Postsecondary Information System

NGS: National Graduate Survey
CSLP: Canada Student Loans Program
CESP: Canada Education Savings Program

AG: Apprentice Grant
CAL: Canada Apprentice Loans
NAS: National Apprenticeship Survey

ELLLP linkage environment (no data)
Datasets related to PSE students and apprentices:

- Aboriginal Peoples Survey
- Canadian Survey on Disability
- Immigration longitudinal database (IMDB)
- Other surveys in SDLE
- Census, NHS (2006 and ongoing)
- Programme for the International Assessment of Adult Competencies
- Various Jurisdictional files
- Labour Force Survey (2004 and ongoing)
- Longitudinal and International Study of Adults
- Youth in Transition Survey
- Various Jurisdictional files

Education linkage vision

SDLE linkage environment (no data)

ELLP linkage environment (no data)
ELLIP: recent analytical projects

- Pilot projects to produce graduate outcome indicators for the Maritime universities and B.C. postsecondary institutions
- Maritime universities student pathway indicators (pilot study)
- Alberta Benefits to Postsecondary Education Project (Alberta provincial release, Feb. 2018)
- RAIS Pilot Longitudinal Study: Indicators on pathways, earnings and mobility for Nova Scotia and New Brunswick, and Alberta
- RAIS Longitudinal Study: Indicators on pathways and earnings for all provinces and territories
ELLLP: Current projects

- As of the end of March 2018, graduate outcome indicators were produced for all provinces and territories.

- The Canadian Student Loan Program file is being linked to the Maritime pilot project data to expand the analytical potential with loan information.
  - Files in the ESDC-FRDC as of Spring 2018

- Apprenticeship Loans and Grants files are also being linked for program evaluation purposes.
**Outputs**

- Set of education indicators to be produced annually
- Customized analytical files
  - E.g., data used for *Insight on Canadian Society* article ‘Labour market outcomes of graduates from universities in the Maritime provinces, 2006 to 2011’ (Maritime university graduates aged 20 to 35, cohorts 2006 to 2011, with tax data, not studying full-time, not self-employed)
- Microdata available to researchers in the RDCs
  - PSIS data linked with selected tax variables for the Maritime provinces available since December 2017
  - Access is granted once approval is obtained (http://www.statcan.gc.ca/eng/rdc/process)
Labour market outcomes of Ontario postsecondary graduates (preliminary results)
The ELLP allows the examination of labour market outcomes of graduates

2013 cohort
173,045 graduates

Notes: Preliminary results for the 2013 cohort of graduates observed 2 years later in 2015. Results for other cohorts are also possible. Categories may not add up to 100% due to rounding. Categories are mutually exclusive: category 2 excludes category 1; category 3 excludes categories 1 & 2; category 4 excludes categories 1, 2 & 3.

The next section is based on 2013 Ontario graduates who:
• were under age 35 at graduation and who in the in the year of income analysis:
  • had tax information
  • were not attending school full-time
  • had employment earnings $0 or were self-employed
Distribution of the 2013 Ontario graduates in the 2015 outcome analysis, by type of program

Women
57,425 graduates

- Undergraduate degree: 51%
- College diploma: 22%
- Other: 6%
- Master's degree: 11%
- Professional degree: 2%
- Doctorate degree: 1%

Men
43,575 graduates

- Undergraduate degree: 47%
- College diploma: 26%
- Other: 6%
- Master's degree: 11%
- Professional degree: 2%
- Doctorate degree: 2%

Note: Preliminary results for the 2013 cohort of graduates under the age of 35, excluding those without tax data and who returned to school full-time in the year of analysis. In this study, 'Professional degrees' (Law, Medicine (MD), Dentistry, Veterinary medicine, Optometry, Pharmacy) are separated from undergraduate degrees.

On average, one out of ten postsecondary graduates reported self-employment income two years after graduation

Note: Preliminary results for the 2013 cohort of graduates under the age of 35, observed 2 years later in 2015, excluding those without tax data and who returned to school full-time in the year of analysis.

Median employment income\(^1\) by education level and graduating cohort

**WOMEN**

<table>
<thead>
<tr>
<th>Education Level</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>College diploma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergraduate degree</td>
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<td></td>
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</tr>
<tr>
<td>Master's degree</td>
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<tr>
<td>Doctorate degree</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional degree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MEN**

<table>
<thead>
<tr>
<th>Education Level</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>College diploma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergraduate degree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master's degree</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctorate degree</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Professional degree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Preliminary results for the 2010 to 2013 cohort of graduates under the age of 35, observed 2 years later, excluding those without tax data and who returned to school full-time in the year of analysis. 1. Employment income includes employment earnings (wages, salaries, other employment income) and net self-employment earnings.

Median employment income in 2015 varied by field of study and type of program.

Notes: Preliminary results for the 2013 cohort of graduates under the age of 35, observed 2 years later in 2015, excluding those without tax data and who returned to school full-time in the year of analysis. 1. Employment income includes employment earnings (wages, salaries, other employment income) and net self-employment earnings. 2. The small number of fields of study are selected as some of the more popular fields from the 49 series in the Classification for Instructional Programs (CIP) Canada 2011. In this study, ‘Professional degrees’ (Law, Medicine (MD), Dentistry, Veterinary medicine, Optometry, Pharmacy) are separated from undergraduate degrees.

Median employment income\(^1\) increases over time

![Graph showing median employment income increases over time for women and men, 2010 graduates.](image)

**Note:** Preliminary results for the 2010 cohort of graduates under the age of 35, for the same persons observed 2 and 5 years later (2012 and 2015), excluding those without tax data and who returned to school full-time in any of the five years of analysis. There are some institutions with data gaps for the 2010 cohort. 1. Employment income includes employment earnings (wages, salaries, other employment income) and net self-employment earnings.

The geographic retention rate* 2 years after graduation decreases with levels of education above the undergraduate.

**Note:** Preliminary results for the 2010 to 2013 cohort of graduates under the age of 35, observed 2 years later, excluding those without tax data and who returned to school full-time in the year of analysis.

**Source:** Statistics Canada. *Postsecondary Student Information System* (PSIS), 2009/2010 to 2013/2014 and *T1 Family File* (T1FF), 2012 to 2015 (subset compiled from linked files extracted January 30, 2018).
Geographic retention rates vary by field of study and gender

For College diploma:
- Family, consumer and human sciences
- Health
- Business, management & marketing
- Communication & journalism
- Security and protective services
- Engineering

For Undergraduate degree:
- Business, management & marketing
- Health
- Psychology
- Visual and performing arts
- Social sciences
- Biological and biomedical sciences
- Education
- Engineering

Note: Preliminary results for the 2013 cohort of graduates under the age of 35, observed 2 years later in 2015, excluding those without tax data and who returned to school full-time in the year of analysis. 1. Geographic retention rates refer to the proportion of Ontario graduates aged 15-34 at graduation, still living in Ontario 2 years later. 2. Only most popular fields of study out of 49 series are shown in these charts.

Multiple credentials analysis (preliminary results for British Columbia)
Multiple Credentials

- Postsecondary graduates who accumulate more than one certificate, diploma or degree, either concurrently or over a period of several years, are referred to here as graduates with multiple credentials.
- There is an interest in learning more about students’ completing more than one credential and what effect it has on their labour market outcomes.
- There is also an interest in the outcomes of graduates who take a traditional path in earning more than one credential and graduates who take a less traditional path.
  - **Traditional path:** moving to a higher credential in the years after their initial graduation (i.e. a bachelor's degree followed by a master’s degree).
  - **Non-traditional path:** obtaining an additional credential where the first credential is not a prerequisite (e.g. bachelor’s degree then a college certificate or diploma).
Distribution of single and multiple credentials, British Columbia graduates

Distribution of the 2009 graduates with single vs. multiple credentials obtained from 2009 to 2014, by education level of the credential attained in 2009

<table>
<thead>
<tr>
<th>Education level obtained in 2009</th>
<th>Single credential</th>
<th>Multiple credentials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>%</td>
</tr>
<tr>
<td>Career training¹ Certificate</td>
<td>11,160</td>
<td>77.1%</td>
</tr>
<tr>
<td>Career training¹ Diploma</td>
<td>4,710</td>
<td>67.6%</td>
</tr>
<tr>
<td>Career training¹, Other Short Credential</td>
<td>985</td>
<td>79.4%</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>15,100</td>
<td>74.8%</td>
</tr>
<tr>
<td>Other²</td>
<td>8,780</td>
<td>81.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40,735</td>
<td>75.8%</td>
</tr>
</tbody>
</table>

Notes: Numbers are randomly rounded to base 5.
1. ‘Career training’ refers to the ‘Career, technical or professional training program’ category in PSIS.
2. This category includes all other education levels with small counts by cell.
## 2009 Bachelors' degree graduates with and without multiple credentials by 2014, British Columbia institutions

<table>
<thead>
<tr>
<th>Bachelor degree in 2009 + any other credentials (obtained 2009 to 2014)</th>
<th>Counts</th>
<th>% distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bachelor's degree</td>
<td>15,100</td>
<td>75%</td>
</tr>
<tr>
<td>2 Bachelor's degrees</td>
<td>420</td>
<td>2%</td>
</tr>
<tr>
<td>1 Bachelor's degree + 1 Master's degree</td>
<td>1,010</td>
<td>5%</td>
</tr>
<tr>
<td>1 Bachelor's degree + 1 Career training(^1) diploma</td>
<td>345</td>
<td>2%</td>
</tr>
<tr>
<td>1 Bachelor's degree + 1 Career training(^1) certificate</td>
<td>355</td>
<td>2%</td>
</tr>
<tr>
<td>1 Bachelor's degree + Other type of credential</td>
<td>2,970</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20,205</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Notes:** Numbers are randomly rounded to base 5.

1. ‘Career training’ refers to the ‘Career, technical or professional training program’ category in PSIS.

2009 Bachelor’s degree graduates who then obtained a college credential\(^1\) between 2009 and 2014, British Columbia institutions

<table>
<thead>
<tr>
<th>College credential obtained in:</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same institution type, same field of study</td>
<td>250</td>
</tr>
<tr>
<td>Same institution type, different field of study</td>
<td>125</td>
</tr>
<tr>
<td>Different institution type, same field of study</td>
<td>175</td>
</tr>
<tr>
<td>Different institution type, different field of study</td>
<td>460</td>
</tr>
</tbody>
</table>

Notes: Numbers are randomly rounded to base 5.
1. College credentials include: certificate or diploma for a ‘Career, technical or professional training program’ or for a ‘post career, technical or professional training program’ (post-diploma certificate).
Student pathway indicators (preliminary results)
Persistence and Completion Rates for students in a program leading to an undergraduate degree

2009/10 cohort of new entrants under age 20, Ontario institutions

Note: The 2009/10 new entrants cohort includes students aged less than 20 on Dec. 31st, 2009, first enrolled in 2009/10 and full-time in Fall 2009, in a program leading to an undergraduate degree in a Ontario public college or university.

### Summary of persistence and cumulative graduation rates for the 2009/10 cohort of new, full-time entrants under age 20 in an undergraduate degree program in Ontario

#### Enrolment and graduation status

<table>
<thead>
<tr>
<th>Enrolment and graduation status</th>
<th>Fall 2009 (1st year)</th>
<th>Fall 2010 (2nd year)</th>
<th>Fall 2011 (3rd year)</th>
<th>Fall 2012 (4th year)</th>
<th>Fall 2013 (5th year)</th>
<th>Fall 2014 (6th year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the student still enrolled in or did they graduate from an undergraduate degree at the same institution?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes - still enrolled, not yet graduated</td>
<td>100.0%</td>
<td>86.9%</td>
<td>79.6%</td>
<td>68.2%</td>
<td>29.3%</td>
<td>7.4%</td>
</tr>
<tr>
<td>Yes - graduated</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.7%</td>
<td>8.8%</td>
<td>45.7%</td>
<td>67.3%</td>
</tr>
<tr>
<td>No</td>
<td>0.0%</td>
<td>13.0%</td>
<td>19.8%</td>
<td>23.1%</td>
<td>24.9%</td>
<td>25.3%</td>
</tr>
<tr>
<td>Is the student still enrolled in or did they graduate from an undergraduate degree from an Ontario institution?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes - still enrolled, not yet graduated</td>
<td>100.0%</td>
<td>89.2%</td>
<td>83.4%</td>
<td>72.4%</td>
<td>32.7%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Yes - graduated</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.7%</td>
<td>9.0%</td>
<td>47.1%</td>
<td>70.0%</td>
</tr>
<tr>
<td>No</td>
<td>0.0%</td>
<td>10.8%</td>
<td>15.9%</td>
<td>18.6%</td>
<td>20.2%</td>
<td>20.6%</td>
</tr>
<tr>
<td>Is the student still enrolled in or did they graduate from an undergraduate degree program anywhere in Canada?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes - still enrolled, not yet graduated</td>
<td>100.0%</td>
<td>89.6%</td>
<td>84.0%</td>
<td>73.1%</td>
<td>33.3%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Yes - graduated</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.7%</td>
<td>9.0%</td>
<td>47.3%</td>
<td>70.4%</td>
</tr>
<tr>
<td>No</td>
<td>0.0%</td>
<td>10.4%</td>
<td>15.3%</td>
<td>17.9%</td>
<td>19.4%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Is the student still enrolled in or did they graduate from an undergraduate degree in the same field of study (13 primary groupings) from any Ontario institution?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes - still enrolled, not yet graduated</td>
<td>100.0%</td>
<td>70.7%</td>
<td>62.3%</td>
<td>51.6%</td>
<td>21.7%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Yes - graduated</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.6%</td>
<td>7.7%</td>
<td>36.1%</td>
<td>52.3%</td>
</tr>
<tr>
<td>No</td>
<td>0.0%</td>
<td>29.3%</td>
<td>37.1%</td>
<td>40.7%</td>
<td>42.2%</td>
<td>42.5%</td>
</tr>
</tbody>
</table>

**Note:** The 2009/10 new entrants cohort includes students aged less than 20 on Dec. 31st, 2009, first enrolled and full-time in Fall 2009, in a program leading to an undergraduate degree in Ontario. **Source:** Statistics Canada. Longitudinally linked Postsecondary Student Information System data, 2008/09 to 2014/15; extracted Jan. 2018.
Graduation rates of the 2009/2010 Ontario undergraduate degree entrants cohort, by Fall 2014 (5 academic years later)

- In Canada: 70.4%
- Same province: 70.0%
- Same institution: 67.3%
- Same field of study and province: 52.3%

**Note:** The 2009/10 new entrants cohort includes students aged less than 20 on Dec. 31st, 2009, first enrolled and full-time in Fall 2009, in a program leading to an undergraduate degree in an Ontario university or college.

Other derived highlights:

- The largest increase in the proportion of students who leave their undergraduate degree program before graduation\(^1\) takes place between the first and the second year.

- In the second year:
  - 86.9% continued an undergraduate program at the same institution,
  - approximately 2.3% changed to continue their undergraduate degree program at a different institution in Ontario,
  - a further 0.4% continued elsewhere in Canada.

- Additionally, 18.5% of the undergraduate degree students still at an Ontario institution switched their field of study by second year. (Some changes in field of study grouping may be related to how students with no specialization in first year are classified.)

\(^1\) Includes those who cannot be traced due to selected data gaps.

Notes: The new entrants cohort includes students aged less than 20 on Dec. 31st, 2009, first enrolled and full-time in Fall 2009, in a program leading to an undergraduate degree in an Ontario university or college.

Characteristics of the 2009/2010 Ontario entry cohort, still enrolled in an undergraduate program in Fall 2010

Notes: The categories are not mutually exclusive.
The new entrants cohort includes students aged less than 20 on Dec. 31st, 2009, first enrolled and full-time in Fall 2009, in a program leading to an undergraduate degree in an Ontario institution.

Moving forward

- Publish selected indicators
- Complement the platform with other student and apprentice data files (e.g. Canada student loan, apprenticeship loans, National Graduate Survey or National Apprenticeship Survey)
- Complete the work to make linked files accessible to researchers
- Update and grow the linkable possibilities!
We welcome your feedback and questions

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