

MEASURING WHAT CANADIANS VALUE

A Pan-Canadian Data Strategy for Post-secondary Education

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EXECUTIVE SUMMARY

The Canadian Council on Learning has prepared the “*Pan-Canadian Data Strategy for PSE*”, a comprehensive plan for gathering and utilizing information that is required to make possible the sustained success of the PSE sector in Canada.

This paper argues that a data strategy for post-secondary education in Canada is an essential prerequisite for future prosperity, social sustainability and cohesion. Without a pan-Canadian strategy to obtain the necessary data, the full potential of the enormous federal, provincial-territorial and individual investments in post-secondary education will not be realized. Rather, the present condition, where nationwide coherence, coordination and comparability are unobtainable, will continue to prevail. Moreover, Canada’s capacity to compare the condition and performance of its PSE sector with its international competitors will continue to be compromised.

This paper builds upon the Canadian Council on Learning’s 2006 report entitled *Canadian Post-secondary Education: A Positive Record—An Uncertain Future*. That report advanced a set of eight goals and objectives for the PSE sector. This paper analyses the data required to chart progress on those eight goals and objectives. Within that framework, this paper discusses such key components as the data elements, the benchmarks, the targets and the mechanisms through which a data strategy can be fulfilled. In particular, this paper suggests that without a champion and a process to engage the various stakeholders, little progress should be expected.

It should be clear from the information presented in this report that the situation is urgent. The issues are too important to wait to achieve unanimity on all aspects of a PSE data strategy. Governments already possess the necessary levers to create and sustain such a strategy. In the course of this paper, CCL indicates that key stakeholders also be involved, and suggests an inclusive process to ensure the strategy is successfully implemented.

Although the information identified in the strategy is much needed, CCL recognizes that full implementation of the plan is a medium-term objective. Significant discussions will be required to develop a process to be

followed in order to identify appropriate responsibility centres and the human and financial resources needed for the implementation of the strategy.

Given these realities, CCL suggests that every effort be made now to address the most pressing information issues outlined below, while consideration of a broader strategy proceeds. Three types of initiatives are required in the short term: 1) ongoing and adequate funding for the essential data instruments; 2) comprehensive data on specific and salient issues in each of the eight priority areas for the PSE sector discussed in this paper; and 3) immediate implementation of a unique student identifier, collection and reporting of faculty numbers for colleges, data on adult education and data on private providers.

The following data instruments are surveys administered by Statistics Canada that need stable and appropriate funding to provide regular, timely and relevant data that measure the strengths and weaknesses of the PSE sector in Canada:

- » Access and Support to Education and Training Survey (ASETS)
- » Longitudinal Survey of Immigrants to Canada (LSIC)
- » National Apprenticeship Survey (NAS)
- » National Graduate Survey (NGS)
- » Program for International Assessment of Adult Competencies (PIAAC)
- » Post-secondary Student Information System (PSIS)
- » Registered Apprenticeship Information System (RAIS)
- » Survey of Earned Doctorates (SED)
- » University and College Academic Staff Survey (UCASS)
- » Workplace Employee Survey (WES)
- » Youth in transition survey (YITS—Statistics Canada)

EXECUTIVE SUMMARY

Below is a list of the eight priority areas that were identified in CCL's 2006 PSE, and the key areas where better data are required:

A skilled and adaptable workforce

- Match between skill supply and demand
- Transitions between labour market and PSE
- Apprenticeships—participation and outcomes

Innovation, knowledge and knowledge transfer

- Outcomes and impacts of investment in PSE research
- Stocks and flows of doctorate holders—numbers, percentages of population, supply/demand match
- Brain drain, brain gain, international mobility of doctorate holders (overall and by field)

Active, healthy citizenry

- Impact of PSE attainment on individual health and the health care and social services systems
- Measures of participation in “service learning” in not-for-profits (measure of community engagement)
- Social impacts of learning

Quality PSE

- Graduation/completion, dropout rates and time to completion for all PSE credentials by institution and program
- Student satisfaction measures
- Learner outcomes

Access and opportunity for Canadians and participation and success of under-represented groups

- Enrolment/participation rates across all PSE providers
- Persistence and attainment in PSE, including transitions among PSE providers
- Disaggregating data by sub-population, especially First Nations and male learners

Lifelong learning

- PSE credentials and participation in adult learning
- Adult literacy (16-65)
- Employer investment in adult training/workplace learning

Affordability

- Time series data on student debt (default rate, time to repayment, debt level on graduation—by PSE provider, program, region, employment status)
- Data on how students finance PSE
- Financial sustainability of institutions.

In order to ensure progress, we have identified six issues that should be addressed. The rationale for each is presented. The full data strategy paper and annex provide more detailed background.

EFFECTIVE COORDINATION OF THE PAN-CANADIAN DATA STRATEGY

Greater coordination and coherence among the various intervenors are required to ensure that priorities are set within the overarching data strategy, that priority activities are identified and funded and that results are delivered.

Within the federal government, HRSDC has the broadest responsibility for learners, the PSE sector and labour force issues. In addition, Industry Canada, with its responsibility for the innovation portfolio and coordination of the federal granting councils will be an increasingly important partner in this venture.

PUBLIC REPORTING

Achievement of an effective pan-Canadian PSE data strategy requires regular public reporting and the active involvement of stakeholders.

The adequacy of the PSE information base should be kept in the public eye through regular public reports—a public form of external audit and evaluation. Stakeholders would need to be involved to ensure that the PSE database reflects the public interest.

COLLECTIVE COMMITMENT TO ENSURING A RETURN ON INCREASED INVESTMENT IN PSE

In budget 2007, the federal government proposed an increase in the Canada Social Transfer (CST) of \$800 million per year, stating that “This increase will take effect in 2008–09, allowing discussions with provinces and territories on how best to make use of this new investment and ensure appropriate reporting and accountability to Canadians.”¹

EXECUTIVE SUMMARY

For that reporting and accountability commitment to be a reality, the development and pursuit of a pan-Canadian PSE data strategy should be a central focus of those discussions among the federal, provincial and territorial governments.

CREATING AN ONGOING PAN-CANADIAN FORUM

The development and effective implementation of a pan-Canadian data strategy for PSE is a complex process, and requires active engagement of stakeholders—people and organizations with a professional, personal and/or financial stake in the PSE sector.

There is a need for an annual pan-Canadian forum for discussion among stakeholders of the priorities of the PSE data strategy and system. This forum should include stakeholders such as educators, learners and employers as well as the statistical experts and researchers who are important sources of educational and contextual data and insights, many of whom are active in accountability and reporting activities already.

Substantive engagement of stakeholders requires the opportunity to give serious consideration to complex material before it is considered at the pan-Canadian forum. In addition to public consultation on discussion documents and reports, a series of regional and thematic (e.g., on adult and workplace learning) workshops would allow greater familiarization with the issues, a chance to test controversial views, and the possibility of shaping a consensus prior to the annual pan-Canadian forum.

ENSURING EARLY ACTION

The process of engaging stakeholders and convening the necessary federal-provincial-territorial discussions is pivotal to ensuring a robust pan-Canadian data strategy. However, without immediate action on a number of the identified gaps in both data and the “infrastructure” required for an effective data strategy, Canada will continue to lag behind its sister nations in its capacity to assess and report on the performance and condition of its PSE sector.

In order not to lose the momentum that has been generated by the Canadian Council on Learning’s 2006 PSE report, the related provincial activities (e.g., the BC report *Campus2020*), and the federal government’s commitment

to ensuring reporting on results and opportunities and making these reports more readily accessible to Canadians, immediate action is needed on a limited number of initiatives. Three data issues are seen as particularly urgent:

1. The implementation of a **unique student identifier** that stays with the learner through his/her life. This will enable the tracking of learners as they move from secondary school to PSE, between PSE institutions and the workplace, among PSE providers, and across regions of Canada. Such an initiative is urgent and should be implemented within the next 18 months.
2. A concerted and formalized approach to the introduction of a common data set and a data dictionary that will be applied across the PSE sector, compatible with international standards. This will require a mechanism for developing, maintaining and promoting **standardized specifications** for PSE activities and data elements to enable reliable and comparable data collection and exchange among stakeholders. Such a mechanism could take the form of a formal assignment to Canadian Education Statistics Council (CESC). Again, this is an urgent requirement and should be implemented within the next 18 months.
3. The development of an information base on **adult learning** (especially that from private providers). The lack of data on this aspect of the PSE sector is unacceptable. HRSDC could play a leadership role and the Canadian Council on Learning’s Knowledge Centres on Work and Learning and on Adult Learning could bring together many of the partners and be a useful sounding board for indicators that would provide evidence of the condition and performance of adult learning in Canada.

FINANCING TO MAKE IT HAPPEN

There are inefficiencies in the current situation that can be addressed in part through improved coordination and common standards. However, this will not address the overall need for more effective measurement of the condition and performance of the PSE sector. A discussion concerning the resources required for the implementation of a pan-Canadian data strategy, and how these costs should be shared, is a vital next step.

A Pan-Canadian Data Strategy for Post-secondary Education

CONTEXT FOR THIS REPORT

A national post-secondary strategy should possess three essential characteristics: clearly stated objectives, both general and for specific periods of time; measures to assess achievement of objectives; and a systematic goal of cohesion and coherence among all the facets—as is the case in the E.U. and other developed countries.

Canadian Post-secondary Education: A Positive Record – An Uncertain Future. Canadian Council on Learning, 2006

A remarkable aspect of post-secondary education in Canada is the fact that existing data sets and information sources do not allow for a comprehensive assessment of the strengths and contributions of the sector and the significant investments made annually by governments and learners, despite the sector's importance to society.

Recognizing the urgent need to address these gaps in knowledge, the Canadian Council on Learning has worked to develop a pan-Canadian data strategy for PSE. CCL considers that a data strategy is an essential prerequisite to understanding how PSE can most effectively contribute to Canada's future prosperity. Without such a strategy, coherence, co-ordination and comparability in PSE across the country will be compromised. Moreover, Canada's capacity to compare the conditions and performance of its PSE sector with its international competitors will not be possible.

This paper presents both a PSE data strategy and a number of issues to be addressed that are essential for implementation of such a strategy. The elements of a data strategy for PSE in Canada—an approach to data definition, collection and use—are framed by the eight goals and objectives for PSE that were advanced by the Canadian Council on Learning in its 2006 report on Canadian post-secondary education. That report stressed that Canada lacks national-level mechanisms to ensure coherence, coordination and comparability for PSE and identified the need to put in place the information base required for effective management and evolution of the PSE sector:

Canada needs to develop a clear set of indicators and measures to allow for continuous assessment of performance and progress made toward realization of those goals and objectives at the national level. This requires the definition and development of a consistent, comprehensive, robust and comparable set of measures and data, and the collection and analysis of such data in a manner that enables monitoring of change over time as well as comparison with other countries.

Canadian Post-secondary Education: A Positive Record – An Uncertain Future. Canadian Council on Learning, 2006

The present paper expands on the requirements for information related to each of these goals, and establishes several immediate priorities in order to inform public policy, learner choice, and institutional governance. It also expands on the comments of the 2006 Canadian Council on Learning's report with regard to the need for Canada to develop mechanisms at the pan-Canadian level to provide for the necessary coherence, coordination and comparability in data collection and use, while respecting provincial responsibilities and institutional academic autonomy.

WHO ARE THE USERS OF A DATA STRATEGY?

A pan-Canadian data strategy serves the interests of a range of users who are seeking reliable and timely information on the nature and performance of some aspect of the PSE sector, often in comparison with the performance of other institutions or other countries.

Defining, measuring and improving quality is a critical task for all higher education institutions and a legitimate concern of the stakeholders and governments who fund them.

Ontario – A Leader in Learning; February 2005, p. 2

Key users or clients of PSE data include:

- **Governments** which seek information on international comparability of performance (including learning outcomes), the social and economic return on their investments, and insights on how to refine policies and programs for better efficiency and effectiveness. Governments are also increasingly interested in the role and impact of education in the globalized learning economy, including the broader social goals of education systems (and learning in general).
- **Citizens** who seek accountability on the performance of the sector as a whole and assurance on the alignment of public expenditures with public benefits.
- **Boards of governors and institutional managers** who seek information on institutional performance, competitiveness and operational efficiency, usually in a comparative context. Institutions are also increasingly concerned with accountability to their diverse stakeholders.

- **Learners and their families** who seek information on whether a specific program or institution will provide both a rich learning or training opportunity, the knowledge, skills, and abilities learners need in the labour market and as citizens, as well as the institution's track record on graduation rates and employment.
- **Researchers** who are interested in understanding the relationships between educational practices and social, economic and learning outcomes in order to inform educational practice and policy.

TOWARD A FRAMEWORK FOR CANADIAN PSE DATA

... there is widespread agreement about the difficulties in the current post-secondary system data collection. There is considerable controversy about how this can be remedied.

Campus2020, British Columbia, April 2007

A meaningful data strategy is founded on the priorities, values and expectations of the stakeholders and users of the data. As such, broad acceptance of the eight goals and objectives defined by the Canadian Council on Learning for Canadian PSE delivers an opportune platform from which to build such a strategy. It could provide a means to link data, indicators and data collection instruments with the PSE sector goals and expectations, policy issues, and key research questions.

Three sets of questions have guided the development of the data strategy:

1. **The policy and research questions/conceptual framework** What do we want to know? What are the key system conditions, aspects of performance, and characteristics that are important to users/clients? What do we know about how PSE contributes to social, economic, and learning outcomes and through what mechanisms? What factors mediate these relationships? What can indicators tell us about these questions?
2. **Measurement issues** Are the available data and indicators useful for illuminating the policy and research questions (direct and proxy measures)? Would the indicators provide information we can believe (e.g., robust and comparable)? What do the data mean in different contexts—e.g., among regions of Canada and internationally? What are the major data gaps?
3. **Collection issues** How do we access the data and produce the indicators? What are the quality and availability (including sustainability of financing) of data from existing sources and instruments? What are the priority improvements/refinements? How feasible and cost-effective is it to address the priority data gaps?

This paper focusses on the structure of and conditions for a robust set of PSE indicators that describe and report on the PSE sector. The data strategy comprises a number of components:

1. PSE sector definition

- PSE sector goals and objectives (and associated policy and research questions)
- Defined classifications for PSE institutions (essential for contextualizing any data or indicators)

2. PSE data elements (situated in a framework defined by the goals/objectives and the major policy issues and research questions)

- Management statistics
- Contextual data (some may be qualitative)
- Key indicators
- Benchmarks
- Targets
- Special data collections

3. Criteria for choice of data

4. PSE data infrastructure

- The conceptual model—integrated and holistic
- Information collection and management standards, including policies with regard to privacy and access
- Data collection instruments, and all of the associated technical considerations

5. Systems for data analysis/dissemination/use

- Facilitating access to data
- Research capacity and activity—effective access to and engagement by researchers focussed on issues relevant to the performance of PSE
- Effective modes of dissemination of the outcomes to decision makers, practitioners and the public

6. A process for getting where we want to go

- Human Resources and Social Development Canada should work in close collaboration with Industry Canada, Statistics Canada and other stakeholders to ensure the delivery of the PSE data strategy.
- The federal government should ensure the adequacy of the PSE information base be kept in the public eye through regular public reports—a public form of external audit and evaluation. Stakeholders need to be involved to ensure that the PSE database reflect the public interest.
- A pan-Canadian forum for discussion among stakeholders of priorities and the effectiveness of the PSE sector.
- Specific operational actions that will ensure key data issues are advanced.

1. The PSE Sector in Canada—The Universe under Discussion

The PSE sector across Canada is in a period of significant change. Knowledge and talent are seen as key to both successful societies and economic prosperity in the 21st century. The PSE sector is pivotal in providing an environment conducive to nurturing the requisite knowledge and talent, and in mobilizing that knowledge and talent for societal benefit. In addition to its longstanding commitment to providing Canadians with a liberal education in the arts and sciences, the PSE sector is being challenged both to develop knowledge and to train people in ways that allow them to create, access, and use knowledge that is increasingly multi-disciplinary and global in context. The PSE sector is also being called on to be an active player in the community and to work in partnership with public and private sectors. The outcome has been manifested in new funding and accountability regimes, structural change triggered by provincial governments, and the growing presence of private, for-profit providers

Traditional delineations between universities and colleges are blurring as degree-granting powers are being given to colleges and new institutions with dual mandates are emerging. Provincial engagement in career colleges is under review. Existing institutions are being merged or severed one from another.

A recent paper by Statistics Canada presented a systematic typology for the sector and identified a number of key defining characteristics.² Continuation and pan-Canadian acceptance of this important work are necessary if the data strategy addressed in this paper is to succeed. While this is still a work in progress, it is useful since it captures the current definition of the PSE sector by framing the discussion on the collection of relevant system data and by enumerating the institutions in a 2003 registry, many of which have not been captured by pan-Canadian data collections. Seventy-three degree-granting institutions and 139 colleges and institutes in the following table have not been part of Statistics Canada surveys in the past.

Table 1. Number of post-secondary institutions in Canada based on the typology proposed in the 2003 Orton paper

TYPE OF PSE INSTITUTION	SUB-TYPE	NUMBER IN STC INSTITUTIONS REGISTRY 2003
University and degree-granting		203
	Degree-granting college or institute	4
	Primarily undergraduate	41
	Comprehensive	15
	Medical doctoral	15
	First Nations and Métis	3
	Special purpose	125
Colleges and institutes		317
	Degree-granting college or institute	31
	Multi-purpose	133
	First Nations and Métis	10
	Special purpose	142
Career colleges		497
	Multi-purpose	137
	Special purpose	360
School board adult education		417
Government-direct		18
	Apprenticeship	13
	Special purpose	1
Consortia		2
<i>Registry includes public, not-for-profit and private providers; excludes in-house training activities offering training exclusively to own staff.</i>		
Source: Orton, L. A new understanding of postsecondary education in Canada: A discussion paper. Statistics Canada: Culture, Tourism and the Centre for Education Statistics Division. Catalogue No 81-595-MIE—No. 011 (Ottawa: 2003).		

2. PSE Data Elements

The data elements of a data strategy can be organized in a number of ways. For the purposes of this data strategy a number of specific types of data are defined and used:

- Management statistics
- Contextual data
- Indicators
- Benchmarks
- Targets

Underlying the development of indicators is the requirement for routine descriptive data—the foundational information source, often termed **management statistics** that may be collected as routine administrative data by institutions and government agencies against a pan-Canadian standard or through specially structured surveys, again using pan-Canadian standards. Such data include raw student and faculty counts and revenue and expenditure data. These are used for routine monitoring and also in more complex indicators.

Contextual data are statistics from fields other than education that are linked to the educational statistics in order to provide policy-relevant indicators. They may also be qualitative data that provide essential information on the context in which the core data and indicators are developed and interpreted. Such contextual statistics include demographic, economic, health, quality of life, science & technology, cultural and labour force data, and data on public opinion.

An indicator is “a statistic (or set of statistics) that provides a succinct description of the condition or performance of a system (e.g., institution, service, economy, society). Indicators can describe inputs, processes, or outputs/outcomes. They can be used to provide evidence of how conditions or performance (e.g., efficiency and cost effectiveness) vary over time (by comparing indicators at different points in time) or across a system (by comparing indicators for different entities ... within a system).”³

Development and interpretation of such indicators can be controversial because of inadequacies of data, subjectivity of some of the measures, and compound nature of the indicators. Such controversy needs to be addressed directly, rather than treated as a reason not to engage in measures of condition and performance. There is also a natural tension between the need for accuracy and the need for simplicity that requires creativity in the conceptualization and reporting of standards. Detailed tables of numbers will not be meaningful to the lay reader where clarity of message is key, but are necessary for solid research and analysis that underpins development of the message.

The next two categories of data are **benchmarks** and **targets**. In some jurisdictions (e.g., the European Union), the terms **benchmarks** and **targets** tend to be used interchangeably. This paper purposely distinguishes between the two terms.

A **benchmark** is defined as the average value of a system performance or condition that provides a meaningful comparison for entities within that system. There are a number of PSE-related attributes that are amenable to full pan-Canadian and international comparisons or benchmarks (e.g., adult literacy levels and percentage of the population holding doctorate degrees). In such circumstances the use of such international comparators can be very effective. In other cases, a more limited comparator set—or benchmark—may be appropriate (e.g., those used as measures of student engagement in the National Survey of Student Engagement NSSE).

Targets, on the other hand, are a numerical expression of what nations and institutions consciously choose as their aspirations for the future. Choosing a ‘target’ is a political and a resource consideration and should be undertaken only after a careful examination of the priorities and the foreseeable costs of reaching the target.

In any data strategy there is also a need for **special data collections**—focussed and time-limited collections of data that allow researchers and analysts to address specific policy questions, to identify and track trends, to illuminate correlations and causal relationships, and to support or challenge pre-conceived theoretical frameworks. Canada needs to develop improved means to coordinate such research activities with the larger pan-Canadian data strategy.

BENCHMARKS AND TARGETS AS A PART OF THE PAN-CANADIAN DATA STRATEGY

There are many public pressures for “league tables”—collections of highly aggregated data that cover a large number of PSE institutions (e.g., Maclean’s). Such tables often integrate diverse factors that may or may not pertain to all institutions or be policy relevant. Rather than focusing on league tables, an effective PSE data strategy, taking lessons from the public reporting of key data from the System of National Accounts, would use **benchmarks** that capture well understood phenomena. A limited number of key strategic indicators are selected that provide information about the condition or performance of regions and PSE providers and can be compared with international or pan-Canadian benchmarks. Some benchmarks might well be context, dependent (e.g., graduation rates) and in this context, comparison of like entities to sub-sector averages⁴ is likely more constructive.

The set of key benchmarks would focus on important dimensions of the system condition or performance that would communicate most effectively the areas for public and institutional attention. To this end, a framework for developing such benchmarks could be structured along the following lines, with benchmarks limited to 10 or fewer key issues, where major progress is needed and public exposure of the problems is critical:

Stocks of learners

- High-school completion rates
- Aboriginal high-school completion rates

Flows

- PSE graduation rates
- PSE attainment levels for the Canadian population
- Adult participation in lifelong learning

Outputs

- Literacy levels
- Doctoral holders per 1,000 population
- Math and science technology graduates—bachelors and doctorate

International experience is that the use of *targets* as part of a pan-Canadian data strategy can be effective for mobilizing public support and stakeholder involvement—but that success requires intensive prior discussion with stakeholders as to why a specific situation needs to be improved and why a specific target is required. In this context, the use of a limited number of pan-Canadian benchmarks can be an effective strategy to advance public discussion of targets.

3. Criteria for the Choice of Data/indicators

For a data and indicator set or strategy to be useful, a number of conditions are required:

- **Relevance** What is measured must be of importance to a user, respond to an information need, illuminate a policy issue, provide explanatory insights. Priorities may have to be set.
- **Validity** The indicator is either a direct measure of the condition, or performance of interest, or a meaningful proxy for it.
- **Clarity** The indicator is easily understood and unambiguous in interpretation.
- **Reliability and consistency of reporting/comparability** There is an agreed upon or common definition/understanding that can be used to produce indicators that are comparable among reporting entities over time.
- **Feasibility** Data should be accessible and affordable to collect.

- **Timeliness** Data should be available in a time frame that makes them useful for the user/client (e.g., student choice or policy action).
- **Accessibility** Data should be easily accessible to the client/user.
- **Comparability** Wherever possible the data should be derived in a way that is comparable with international data standards and collections (e.g., OECD).

However, Canada is far from being in a situation where such a set of indicators exists.

...the fact remains that no comprehensive cross-Canadian database built on common definitions and common timeframes currently exists.

Campus2020 – British Columbia, April 2007

In recent years, there have been many individual initiatives within the PSE sector to improve information, data availability and performance reporting, including the development of some common definitions and standards for data collection and reporting among subsets of the PSE universe (e.g., the G-13 universities). In addition, many Canadian PSE institutions are now using common data-collection platforms such as the National Survey of Student Engagement (NSSE) and the Collegiate Assessment Survey (CLA). These actions have resulted in improvements in data availability and robustness at institutional and regional levels, and within some sub-groups of the larger PSE sector.

However, some problems remain:

- Data gaps, e.g., a lack of college faculty numbers and a lack of data on private providers;
- Timeliness, e.g., time frame to access the outcomes of the National Graduate Survey;
- Poor public accessibility. e.g., the Canadian Association of University Business Officers (CAUBO) data on finances are not publicly available;
- Diverse approaches to and formats for reporting, e.g., reporting on the outcomes of the National Survey of Student Engagement (NSSE);
- Lack of inter-institutional comparability; and
- Lack of a common data strategy and set of common data standards.

There is no common, systematically classified list of all public and private post-secondary institutions in Canada—analogue to and with cross-comparisons to the Carnegie classifications in the U.S.—and the programs they offer. Such a structure is essential to situate indicators in the context of the institution's circumstances. There is a lack of a basic common understanding about what the terms *degree*, *diploma* or *certificate* mean, which makes interpretation of the existing data difficult to impossible

(this is in stark contrast with the emerging use of common standards in Europe from the Bologna process).

The upcoming 2007 edition of *Education at a Glance* (OECD) illustrates this problem. Canadian data for fully 61% of the 84 PSE indicators are either missing or incomplete, in particular the data relating to financial and human resources invested in education.

If Canada is to tackle these challenges effectively and address the gaps identified in the 2006 Canadian Council on Learning's report, a number of other key building blocks are required. These are addressed in the next section.

KEY BUILDING BLOCKS

In addition to the definition of the PSE sector and key data elements, three other sets of issues are key:

- A robust pan-Canadian PSE data infrastructure;
- Effective systems for data analysis/dissemination/use; and
- A process for getting where we want to go.

These are discussed in the sections below.

4. The PSE data/information infrastructure

The *PSE data/information infrastructure* represents the *facility* necessary to develop robust data under conditions by which they can be used effectively for research, analysis and policy-making—the equivalent of a large-scale physical facility in natural science. Such an *infostructure* comprises

- A conceptual model;
- Common data and a common data dictionary; and
- Robust data-collection instruments.

The conceptual model

A conceptual model links information/indicators to each of the eight goals/objectives. This framework not only allows for insights on condition and performance, but also becomes the focus of critical attention: researchers assess its validity in analyzing data that emanates from data collection activities. Work is also required on innovative indicators where the current basket of indicators reflects what is available rather than what should be measured in the context of the conceptual framework. Details on the policy and research issues that relate to each of the eight Canadian Council on Learning goals and objectives are identified later in this paper.

Common data and common data dictionary

This element comprises standardized data elements and definitions for elements captured in the PSE and related databases, allowing inter-connections for analysis.

Based on experiences with the Canadian Association of University Business Officers (CAUBO) data on university finances—and the contention that is associated with most public data—this lack of common data and a common data dictionary is the largest stumbling block to delivering a successful data strategy in Canada. Yet, without such a base, the data strategy will be stillborn. It is equally important that any data standards be developed with international standards and conventions in mind (e.g., OECD) and every effort be made to ensure comparability.

This paper suggests that an investment be made to develop, as a key priority, a common data set and a data dictionary that will be applied across the PSE sector. Such an approach needs to ensure there is adequate consideration of data quality and robustness.

Data collection instruments

The data strategy requires provision of a cost-effective and evolving set of data-collection instruments that are developed in an integrated manner—regardless of how they are delivered. These instruments need to be implemented in a timely fashion that reflects best practices internationally and that provide significant insights on key policy and research issues.

Many sources of information exist, but these are not fully strategic: they do not provide full coverage or answer every important question. Also, there are disturbing gaps in the collection, completeness and analysis of data. The lack of data on adult education and on private providers is particularly troubling. An equally serious roadblock is the lack of an individual student identifier that would allow the tracking of the learner's passage through learning and work.

However, many key instruments exist that are critical parts of the solution, but that need attention (and in some cases, these instruments do not even have secured funding), for example:

- Post-secondary Student Information System (PSIS), which is supposed to include college faculty data, but which even in the last iteration does not.
- Labour Force Survey (LFS), a solid vehicle with monthly production, but which would benefit from a stronger educational core such as a set of new questions.
- National Graduate Survey (NGS), which would benefit from being run more often than every five years and should have a longer longitudinal baseline (e.g., to 10 years).

Equally important, it is apparent that not all institutions fulfil their responsibility to respond fully to some pan-Canadian data collection activities managed by Statistics

Canada (e.g., Post-secondary Student Information System). The comparability, validity and usefulness of such instruments are contingent on their completeness, and such non-compliance by institutions undermines the purpose of the data collection.

Based on current information, Statistics Canada is not invoking its mandatory powers to resolve this situation. This report suggests that there are two options with respect to ensuring the integrity of the data.

1. Statistics Canada could publish an annual report on the state of responses to its data collection requirements. Also, there could be communication with the Association of Universities and Colleges of Canada (AUCC) and the Association of Canadian Community Colleges (ACCC) on which institutions are in default and the consequences thereof.
2. The federal government could explore with provinces the possibility of making increased transfers to provinces for PSE, contingent on satisfactory compliance, and seek the engagement of the relevant provincial authorities in facilitating compliance.

Whatever the approach to the development of a data strategy, consideration should be given to the establishment of such a forum, which could also deal with “who pays”. While data collection and analysis are expensive, there is some validity to the argument that the current situation of uncoordinated reporting requirements and activities, and decisions taken in the absence of robust nationally comparable evidence is even more expensive.

Annex 01 contains an inventory of existing instruments and owners/responsibility centres, including comments on the core data elements, conditions and restraints on data interpretation and the current state of financing/sustainability.

5. Systems for data analysis/dissemination/use

There is little value in data collection without systems for *data analysis, dissemination and use*. Three particularly important components of the data strategy entail:

- Facilitating access to data;
- Mobilizing research and analysis capacity; and
- Ensuring effective modes of dissemination.

Facilitating access to data

In recent years, it has become a public issue that relevant data needs to get into the hands of researchers through a number of distinct actions, in particular:

- The Data Liberation Initiative (DLI), which made the public data use files of Statistics Canada accessible

for free to PSE researchers through a special licensing agreement; and

- The Research Data Centres (RDC) initiative, funded by Canada Foundation for Innovation (CFI), Social Sciences and Humanities Research Council (SSHRC) and Canadian Institutes of Health Research (CIHR), which makes available to qualified researchers the micro data sets of a number of key Statistics Canada surveys⁵ in secure locations across Canada.

There are, however, continuing concerns that there is not timely or easy access to many data sets that would be useful to researchers and decision-makers.

Mobilizing research and analysis capacity

Too frequently, existing data sets are not transformed in a timely way into useful information for decision-makers and managers. It is not clear if this is Statistics Canada’s responsibility and, if not, whose responsibility is it, and how should this responsibility be coordinated? Would it be better to collect fewer data and make better use of what we have now?

Two initiatives offer some promise if used in a more effective way:

- The Canadian Education Statistics Council (CESC)/Pan-Canadian Education Indicators Program, which has commissioned research on issues related to education (although not with a strong focus on PSE); and
- The Research Data Centres, which have the potential to mobilize much more extensively than at present the interests of the academic research community, if there were a strong demand pull from users and clear articulation of the specific policy questions.

There are, however, some bright spots. The Canada Millennium Scholarship Foundation (CMSF) has commissioned and carried out some excellent research on student access and financing using existing data and commissioned surveys to fill in the gaps. What can be learned from this model?

Effective modes of dissemination

A key part of the data strategy is dissemination of the outcomes of data analysis to policy-makers, practitioners and the public. Even with a strong database, there is a continued need for more capacity to distill data into policy-relevant information on which decision-makers and managers can act.

A high public profile about the condition and performance of the PSE sector creates greater public awareness about the importance of public and private investment in PSE and creates a natural feedback mechanism with the users of data whether they are policy-makers, practitioners or learners.

It is also interesting to speculate on why education statistics do not normally receive the same attention as labour market and economic statistics which appear at regular intervals with much media coverage.

The Canadian Council on Learning has played a leadership role recently in painting a public portrait of Canadian PSE by pulling together a number of disparate sources of information, even while identifying data gaps. The *Campus2020* report commissioned by the Province of British Columbia identifies the lack of a comprehensive pan-Canadian database on PSE and argues for the need to support good planning with good information.

6. A process for getting where we want to go

The final component of the data strategy is one of process—a means of taking us from where we are to *where we want to go*. Three aspects of that process are key:

1. Keeping the adequacy of a PSE information base in the public eye through regular public reports;
2. A process for stakeholder engagement and establishment of priorities; and
3. Operational actions that will ensure the priority elements of the data strategy are tackled.

Regular public reporting

It is essential to keep the adequacy of a PSE information base in the public eye through regular public reports—a public for audit and evaluation. This should be done in collaboration with stakeholders to ensure that the PSE database reflects the public interest.

A process for stakeholder engagement and identification of priorities

The development and effective implementation of a PSE data strategy is a complex process. Experience has shown that there needs to be an active engagement of stakeholders—people and organizations with a professional, personal, and/or financial stake in the PSE sector.

This data strategy proposes that there be a continuing pan-Canadian forum for discussion among stakeholders of the priorities of the PSE data system. Such a forum should include various stakeholders, such as educators, learners, institutions, policy-makers and employers as well as the statistical experts and researchers who are important sources of educational and contextual data for insights.

Inevitably, there will be differences of opinion regarding the key policy questions and the type of information that is needed and cost effective. But, the development of

a common understanding of the diverse stakeholders' interests is a critical part of developing the support to tackle issues around revising existing instruments, setting priorities for funding, and devising any necessary changes in the organizational structure of a pan-Canadian data system.

There is a good chance that a single forum will not be adequate and that there would be value in regional sub-groups. However, this paper recognizes the particular importance of creating at least one pan-Canadian venue for such discussions.

Further, specific data instruments will need panels of experts convened more frequently than once a year to ensure these instruments are as comprehensive and useful as possible.

Specific operational actions to ensure key data issues are advanced

Even with the need to engage stakeholders in the larger questions around the implementation of the proposed data strategy, this agenda will take time, and there is a need to move rapidly. Already, there are a number of items that have been identified as critical gaps in the current system. There should be immediate action to address these gaps through working groups tasked with reporting within a limited time on necessary actions. Among these are:

- Development of a unique student identifier
- Collection and reporting of faculty numbers for colleges
- Data on adult education
- Data on private providers

There are also many strong data initiatives underway at regional or sub-group levels (e.g., the G-13 universities) on which broader inter-institutional agreement on standards would provide early wins for the pan-Canadian data strategy.

INTERNATIONAL EXPERIENCES

Countries vary enormously in their approach to data collection and use—with the organization of statistical systems for PSE data reflecting past practices and the distribution of roles and responsibilities among stakeholders within each country. What is increasingly clear is that structured engagement of both statistical expertise and subject-matter expertise is key for a strong data system, but that there is no single “blueprint” for success. In a 2000 document examining international experiences with national systems of criminal justice statistics,⁶ a powerful analysis of both centralized and decentralized systems revealed the fact that any national system needs

to focus on means to overcome the challenge of distance and connection among the substance experts, the statistical experts and the policy-makers.

But, even within a diverse and complex field in which few countries have clearly articulated national data strategies for PSE, Canada's record is woefully inadequate. While all European OECD countries have been harmonizing their data collection and reporting mechanisms to meet the OECD requirements for research and analysis on education, Canada is able to provide only a very limited number of the basic data tables required for the 2007 Education at a Glance. Out of the 84 PSE-related indicators, Canada is missing 41 (49%) and 12% are incomplete. Basic data, such as the most recent figures for expenditures on education or the most recent numbers of students enrolled in post-secondary education by age group, are simply not available.

Of the 30 OECD countries, 21 European countries are in full compliance with OECD data requirements. Non-OECD countries, such as Israel and the Russian federation, are gradually harmonizing their data collection mechanisms in order to be able to meet OECD reporting requirements. Canada's data commitment is not only to its citizenry, but also to the international community. Our inability to report timely, reliable and internationally comparable data puts Canada in a disadvantaged position compared to other international jurisdictions.

It is also striking that other nations, recognizing the centrality of PSE to social and economic sustainability, are making structural changes to improve the quality of reporting. For example, in 2004, in the U.K., the Higher Education Statistics Agency (HESA) took over the production and publication of performance indicators from the Higher Education Funding Council for England (HEFCE). The outcomes were: a) earlier publication, because it became a single source of data collection, and b) more reliable data providing a means for institutions to confirm their data were correct.

In other nations, there are equally passionate calls for action to develop more robust systems of PSE data. The following quote is from a 2005 letter from the State

Higher Education Executive Officers in the US (SHEEO) to initiate national discussions on higher education:

The absence of accurate, reliable information is a formidable obstacle to educational improvement. All of us with responsibility for performance—at the national, state, and institutional levels—need facts at the state and institutional levels to identify problems, set appropriate goals, monitor performance, and sustain progress.

The existing national post-secondary data system, however, cannot provide accurate information on graduation rates, transfer, net cost, or success in the job market. It falls short because students move among in-state and out-of-state institutions and back and forth between our institutions and the workforce. These individual students cannot be tracked because the current data system relies primarily on information about groups of students enrolled in individual institutions at single points in time. This outmoded system is increasingly incapable of responding to legitimate questions requiring longitudinal data.

2005 Letter from Paul Lingenfelter, President, SHEEO
To Members of the US Senate and House of representatives

What is clear from the experience of all the jurisdictions discussed is that there is a trend toward more consolidation and creation of a national data strategy. Canada lags behind.

CONCLUSION

The success of Canada as a society and an economy is increasingly dependent on a vibrant and effective PSE sector. The Canadian economy is being challenged by the speed of global change and the emergence of new nation states eager to supplant North American and European interests. Two thirds of jobs will require some form of post-secondary qualification. Canada needs to align the education and training provided by Canadian institutions with the workplace and citizenship needs of the future. However, Canada does not have enough information and data in a comparative form to know how well the country is doing, and what issues need to be addressed. A pan-Canadian PSE data strategy forms an essential part of the solution.

01. A skilled and adaptable workforce

WHAT WE ARE TRYING TO ACHIEVE

- Produce a skilled and adaptable workforce to meet the human resource needs of the country in the 21st century
- Ensure effective linkages between post-secondary education and the labour market

POLICY ISSUES

- The supply/demand match/mismatch
- Responsiveness of the overall PSE sector to expressed needs of the learner and the labour market over the short and long term
- Quality and pertinence of labour supply to emerging needs
- Role of PSE in the new economy (being ahead of the curve)
- Recognition and portability of credentials for all learners (within Canada and from abroad)
- Flexibility and adaptability of PSE sector to changing contexts

RESEARCH QUESTIONS

Responsiveness of the overall PSE sector to individual learner needs and aspirations in relation to career choices

Is there adequate choice among vocational and trades training, apprenticeships, and higher learning? Is there effective articulation among all elements of the PSE sector? What is the adequacy of credential recognition among regions of Canada?

The supply/demand match/mismatch

What do we know about labour-market needs, both short term and longer term and how well is that information communicated to learners? What is the suitability of supply in relation to demand, mix of technical skills (e.g., trades) and higher-learning skills (e.g., professional and management)? How is the demand for skilled-trades training managed and are apprenticeship programs meeting the need?

Quality and responsiveness of the overall PSE sector to current and foreseen labour-market needs

Do we have the necessary entry level skills, higher level skills, availability of experienced and credentialed personnel (professional and trades), individual adaptability to work, timeliness of supply, mobility and geographic availability? Are there adequate quality and pertinence of labour supply—diverse and emerging literacies (e.g. traditional literacy, numeracy, and computer literacy), critical and reflective thinking, problem solving, capacity for early productivity and ongoing workplace learning?

Larger societal effectiveness of PSE

How well are PSE learning outcomes equipping individuals with the flexibility and adaptability to deal with a changing labour market and meeting skills expectations over the course of a working life? What do we know about the correlations of PSE attainment with employment, unemployment, type of employment—e.g., precarious work, long-term employability (including movement in and out of the labour force), and underemployment?

Appreciation of different competencies

Is there a common understanding of the competencies needed and supplied by universities, community colleges and other PSE providers (what learners can do and what they know) and are there adequate measurements of how these change over the course of the credential (the value-added by the PSE experience)? Who is measuring this added value and how are they doing it; what does it reveal?

Adult literacy as a competency

To what extent is there an erosion of literacy in the workplace, is this acknowledged as an issue, and what strategies and approaches are effective in addressing it?

Institutional interventions that affect labour-market success

What evidence do we have on the impact and effectiveness of various forms of training and education that connect learners to the workforce (e.g., co-op

programs, internships and service learning)?⁷ Are there other institutional policies and practices that influence the success of learners in the labour market?

Managing change

Given changes in the ethnic and demographic make-up of the labour force and the changing nature of work and employment, how well is the PSE sector as a whole, and its component parts, dealing with these issues and supporting individuals in transition (e.g., the decreasing number of traditional labour-force entrants, the role of the PSE sector in assisting immigrants and non-traditional sources of labour supply, including Aboriginals, persons with disabilities, and older workers)? Are there significant changes in the relative roles of universities, colleges and private educational institutions in supporting a skilled and adaptable workforce?

Immigrant experiences in the workforce

What do we understand about immigrant experiences in the labour market? This information would enhance our understanding of how best to shape program re-

sponses to integrate and maximize the skills and education of recent immigrants. The results of Statistics Canada's planned follow-up of the 2005 study based on the first two years' experience of immigrants⁸ will provide much-needed longitudinal information. Such data need to be meshed with research on and analysis of interventions that improve the chances of immigrant integration into the workplace.

The new economy

What do we understand about the dynamics and role of human capital in individual and organizational productivity and success at a sector level within the labour market? How is that understanding transmitted to the PSE sector and incorporated into changes in the curriculum and learning experiences?

International competitiveness of the workplace

Is Canada internationally competitive in its ability to attract and retain highly qualified personnel to the workplace (e.g., PSE faculty, senior managers in business)? What do we know about the brain gain and brain drain?

DATA STRATEGY ISSUES

- Without a unique personal identifier that stays with an individual throughout his/her learning and work career, there are significant problems in tracking formal linkages among various initial and continuing training, learning and career choices.
- There are remarkably few data on individual or employer satisfaction with education and training experiences as those experiences relate to work effectiveness, productivity, adaptability and career options. This gap should be addressed.
- There are no meaningful data on private providers and the return on investment that learners obtain from their studies at these institutions.
- Even where there is an existing knowledge base that is effective in finding educational interventions to integrate immigrants into the workplace (e.g., some of the work emanating from the Metropolis project), the outcomes of that work are neither broadly understood nor used by practitioners or policy-makers.

FUTURE DATA EXPECTATIONS

Labour-market supply/demand match/mismatch

- Labour-market demand and supply
 - By sector—forecasts of demand and supply, and reports on employment as compared with prior forecasts of demand, at the local, regional and pan-Canadian levels.
 - By sector—forecasts of education requirements for entry to the labour market

(Note: There is a need to refine methodologies to improve future labour-market information, while recognizing that sector-level labour-market forecasting is rarely accurate (Canadian Occupational Projection System COPS).

- Labour-market skill and competency needs—sector specific surveys (WES refined)
 - Employer expectations of skills and competencies required
 - Assessment of the effectiveness of the PSE sector in providing graduates with such skills (match/mismatch) by PSE provider
 - Literacy levels in Canada and in international comparisons, including measures of adult literacy and the retention of literacy skills in the workplace
- Labour-force dynamics
 - By sector, data on employment and unemployment dynamics—duration and transitions by educational attainment—Labour Force Survey (LFS)
- Under-represented groups
 - Labour-market uptake of under-represented groups with PSE credentials, e.g., immigrants, Aboriginal people, persons with disabilities
 - Labour-market retention of under-represented groups
- Data on impact of labour-market oriented interventions
 - Employment placement of trainees from training and education options that connect learners to the workforce (co-op, internships, service learning)
 - Employee and employer satisfaction with programs
- Inter-provincial and regional mobility
 - Data on barriers to inter-provincial mobility

Responsiveness and quality: The functioning of education and training systems for labour-market outcomes

- Labour-market employment outcomes: all PSE by PSE-provider type
 - Labour-market information (longitudinal) on income, earnings, employment and unemployment

levels by PSE attainment level, field of study, gender, socio-economic status, region, with data that can be disaggregated for under-represented groups

- Learner satisfaction with PSE learning and training experiences and the usefulness of knowledge and skills in job performance
- Employer satisfaction with the skills and knowledge of new graduates
- Financial outcomes: income and employment earnings
 - Income levels and lifetime earnings prospects by level of educational attainment
 - Distribution of the income premium by gender, age, region of residence, field of training/study, country and institution of credential

(Note: need to understand changing dynamics of income premium).

- Apprenticeships and trades training (RAIS, NAS)
 - Enrolments and completed credentials by trade, SES, region and gender
 - Time to completion; time to drop out
 - Factors for success and non-completion
- Job-related learning⁹
 - Employer investments in job-related training and learning
 - Individual participation in job-related training during employment
 - Individual investment in job-related training
- Combined credentials
 - Data on articulation, ease of movement and credit recognition between and among colleges and universities.

(Note: There is a need for standardized definitions of certificates and diplomas).

Contextual: Human capital in the new economy

- Understanding the role of human capital—both static and dynamic for economic (e.g., productivity) and social outcomes (e.g., health status)
- Employment growth and PSE attainment over time
- Data on the dynamics of brain gain and brain drain for the PSE sector and for managers and highly qualified personnel (HQP) by sector of the labour market
- New tools to assess the direct impacts of PSE and human capital on productivity

MEASURING WHAT CANADIANS VALUE

KEY DATA PRIORITIES

Table 1. **First wave—priority indicators for pan-Canadian implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Labour-market outcomes	Income status Earnings (cumulative) Employment/ unemployment (or further learning)	By sector and PSE attainment level, field of study, gender, socioeconomic status, age cohort, region, sub-population International comparisons	SLID PCEIP, EAG
Employer satisfaction	Technical skills and competencies Quality and relevance of soft skills	By employment sector and workplace classification, credential, PSE attainment level, region	WES
Private training schools and apprenticeship training	Completed credentials Time to completion Time to drop out Time to employment Ratio—apprentices in labour force	By trade, socioeconomic status, age cohort, region and gender	RAIS, LFS, NAS

Table 2. **Priority management and context data**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Numbers of qualified people in labour-market	PSE attainment—by year and cumulative	By credential, field of study, type of PSE provider International benchmark	LFS, SLID EAG
Employment	Numbers employed and dynamics of labour market	By sector and educational credentials in workforce; data over time	LFS, SLID
Unemployment	Numbers unemployed and dynamics	By level of educational attainment	LFS, SLID
Income distribution	Proportion of population earning 50% median earnings	International benchmark	EAG

Table 3. **Second wave—priority indicators for implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Private providers	Number of institutions Number of programs Number of students Number of students with government assistance	All private PSE providers	Inadequate instruments
Brain drain/gain	Inflows and outflows of HQP by sector		NGS/FOG, SED

Table 4. **Critical framework issues and data gaps to be addressed**

ISSUE	ACTION
New and refined methodologies for labour-market information	Improvements in the forecasting of labour-market demand and supply needs. Use of back-casting to identify methodological issues (COPS)
Lack of information on private providers of training	Expansion of PSIS to cover private institutions
Lack of information on employer's expectations and satisfaction with employee skills and competencies	Sustainable funding for WES and modified content to include more questions directed to employers on their satisfaction with skills and competencies
Lack of information on labour market dynamics	Sustainable funding for WES, SLID (new education/training module), LSIC Modified LFS to update the education questions to current reality
Lack of information on integration of immigrants into the workforce	Further analysis of LSIC and SLID Initiate a new LSIC cohort representative Randomized demonstration projects to evaluate the effectiveness of intervention programs

ACRONYMS FOR INSTRUMENTS

LFS	Labour Force Survey
COPS	Canadian Occupational Projection System
PCEIP	Pan-Canadian Education Indicators Program (CESC)
LSIC	Longitudinal Survey of Immigrants to Canada (STC)
ALL	Adult literacy and life skills survey (STC and OECD)
IALS	International Adult Literacy Survey
SLID	Survey of Labour and Income Dynamics
RAIS	Registered Apprenticeship Information System
NAS	National Apprenticeship Survey
WES	Workplace Employee Survey
NGS	National Graduate Survey
NGS/FOG	National Graduate Survey Follow-up of Graduates
SED	Survey of Earned Doctorates

OTHER ACRONYMS

EAG	Education at a Glance
HQP	Highly qualified personnel

02. Innovation, knowledge creation and knowledge transfer

WHAT WE ARE TRYING TO ACHIEVE

- An effective and high-quality capacity for knowledge generation, dissemination and research training within the PSE sector—and integration of this capacity and the outputs of PSE research and training into the pan-Canadian system of innovation and society at large
- An active engagement by the PSE sector in creating conditions for effective mobilization and uptake of the knowledge outputs (research and highly qualified personnel HQP) by the private, public and not-for-profit sectors

POLICY ISSUES

- Role of PSE research in a pan-Canadian innovation system and social and economic impacts
- Quality of research and scholarship in Canada
- Quality of HQP, quality and currency of research-related skills and competencies acquired, and influence of research training on career trajectories
- Impacts of PSE research on PSE sector
- Impacts of and returns on targeted investments e.g., provincial investments and federal investments in the Canada Foundation for Innovation (CFI), Canada Research Chairs (CRC), Canada Graduate Scholarships (CGS)
- Integration of knowledge outputs into the growth of an innovation system and Canadian productivity
- Contributions of knowledge and innovation to identity, culture and social cohesion

RESEARCH QUESTIONS

In comparison with other countries, Canada has an unusually heavy reliance on PSE research

In comparison with other countries, Canada has an unusually heavy *reliance on PSE research* (Higher Education Research and Development—HERD estimates) relative to business and government R&D in comparison with other nations. In this situation, effective mechanisms for interaction, exchange and knowledge transfer (both codified and tacit) among sectors are exceptionally important. There is also need for more understanding of these interfaces and how increased PSE activity could spur business investment in R&D and/or increase business competitiveness, and promote social innovation. What are the appropriate measures of economic impacts? Is there a limit to what should be expected of universities and if so what does this mean for S&T policy with respect to the private sector?

Economic benefits

What are the economic benefits from commercialization of PSE research activities? What are the most effective modes of achieving Canadian benefit? To what extent do collective agreements support or inhibit commercialization activities?

Areas of impact and pathways of influence

There is increasing recognition of the complexity of the ways in which PSE research and training contribute to the innovation system and to society at large. This includes, but goes well beyond, the production and commercialization of technology. There is recognition of the importance of active interactive networks, the creation of new instruments and methodologies (including social instruments and methodologies), capacity for problem solving, social knowledge (in addition to technology transfer and spin-off creation). However, there is not, as yet, agreement about what constitutes an appropriate framework or a balanced set of indicators to monitor the diverse pathways of influence and to create reliable measures of outcomes (despite Statistics Canada's international discussions on science & technology and innovation indicator frameworks).

Measurements of public and private good: From public investments in research and research training

There are uneven and inadequate measures of the quality and efficiency of public-good outcomes—advancement of knowledge, formation of talent through research, and improvements in the quality

of post-secondary education. A key research question concerns the balance of public and private good from doctoral studies in various fields (as indicated by employability and time to employment; see Survey of Earned Doctorates (SED) outcomes). For certain regions of Canada the out-migration of a high percentage of doctoral graduates raises questions of return on investment (ROI) from expensive programs.

Productivity and quality by field

There is a need for better understanding of what this means and how to measure across different fields. The 2006 CCA report revealed a large gap in measurement tools available for the social sciences and humanities versus the natural sciences and engineering (NSE).

Policy interventions

There is a need for better means to evaluate the relative effectiveness and efficiency of the various instruments that support PSE research, both federal and provincial.

Local appropriation

Considerable importance is being given to ensuring communities and regions realize benefits and returns from PSE research investments. What do we know about local and regional appropriation of benefits from research and research training and the factors for optimizing local returns?

International competitiveness

To what extent do we understand the quality and sustainability of the PSE research environment in the context of increasing investments by other nations? Can Canada continue to attract and retain the best researchers? Is Canada producing an adequate and balanced supply of master's and doctoral graduates for labour-market needs?

Retention of research talent

What is the international mobility of doctoral students and graduates and what are the returns to Canada on the inflows and outflows? To what extent do Canadians studying abroad return to Canada? To what extent do international students stay in Canada in employment linked to their research experience? Longitudinal data spanning at least 10 years are required for policy-relevant analyses.

Competencies developed through research training

Understanding the relationships between research experience and labour-market outcomes. Are we preparing the right types of people and skills for the changing HQP workforce? There is a need for better longitudinal data on career trajectories following post-graduate training (e.g., National Graduate Survey NGS and occasional repeats of the Survey of Earned Doctorates SED). Is the production of doctoral graduates in math, physical sciences, engineering and computer science adequate for Canada's needs? A reverse study of the educational factors for success in the private and public sectors could also reveal significant gaps.

DATA STRATEGY ISSUES

- Gaps do not simply exist at the data level, but also exist when outcomes and impacts frameworks are conceptualized, when indicators are developed and when information is analyzed and synthesized.
- Measures of socio-economic impacts—There is a need for an improved conceptual framework for measuring and assessing the quality and contributions to prosperity and quality of life of PSE research, research training and knowledge transfer.
- Need for better means to measure the impact of research training on career choices and success in the labour market recognizing the fact that an increasing number of private-sector leaders believe that the training of highly skilled personnel through research and the provision of research and advisory services by academic faculty are of greatest economic value (albeit, this is difficult to measure).
- Need for more academically based research capacity in PSE policy who will ensure more effective analysis and refinement of survey instruments as an ongoing responsibility.

FUTURE DATA EXPECTATIONS

Highly qualified personnel (Post-secondary Student Information System, National Graduate Survey, Survey of Earned Doctorates)–assessment of stocks and flows

- Graduate program population dynamics–by program, level of study, gender, institution, Canadian and international students
 - Enrolment
 - Completions
 - Graduation rate
 - Time to graduation
 - Time to drop out
 - Graduates per 1000 population
- Employment and mobility
 - Labour-market outcomes–by field of occupation, sector of labour market and time to employment
 - Relationship of graduate studies to employment
 - Extent of mobility of graduates
- Labour market
 - Number of doctorate holders per thousand population
 - Age structure of doctorate population
 - International flows (into and out of Canada) of doctorate holders
 - Labour-market integration of immigrant doctoral holders
- Institutional actions
 - Number (and percentage) of senior undergraduate and graduate students engaged in co-op placements and internships
 - Impact of external placements on receptor organization and individual
- International comparisons of levels of production–by program, at master’s and doctorate levels
- National Graduate Survey (for the master and doctoral component) –extend longitudinal baseline to 10 years and ensure improved timeliness of data release and analysis of findings; also need to link approach with international indicators on the stocks and flows of HQP, ensure international students are tracked
- Survey of Earned Doctorates–ensure annual data collection and timely analysis

R&D system metrics

- Activities (annual data collection)
 - Performers–Number of researchers by field and institution and time committed to research (methodology for treating research at different-sized institutions and among different fields

embedded in Higher Education Research and Development–HERD estimates)

- Funding–R&D funding by field, institution and source of funding
- Knowledge transfer activities–measures of activities involving diffusion of knowledge, technology and practices, including contributions to public discourse
- Extent of internationalization/globalization
- Linkages
 - Measures of connections among institutions, (e.g., PSE institutions and governments; PSE institutions and firms; PSE institutions and private not-for-profit entities).
 - Measures of connections among individuals (e.g., social networks; problem solving and advice from PSE researchers)
- Outcomes–Improved measures of outcomes, including
 - Level (intensity) of R&D by field and institution
 - Extent of “diffused knowledge” from R&D–through publications, patents, copyrights
 - Areas in which Canada excels in a global context
 - R&D infrastructure that provides Canada with unique advantages
 - Technologies and innovations (licensed patents, other innovations and practices implemented, new methodologies, etc.)
 - Spin-off companies
- Impacts–need for new conceptual frameworks and likely case studies that link R&D activity with larger societal impacts (multiple influences make direct causality measures almost impossible)
 - Well-being–quality of life, quality of citizenship and public discourse, Canada as a successful society
 - Wealth–economic productivity and firm-level competitiveness,
 - Wellness–health outcomes

Priority policy issues

- Data to illuminate the long-term supply/demand functions for doctoral graduates in math, physical sciences, engineering and computer science

Program-specific issues

- Metrics on value-added that relate to specific program initiatives, e.g., Canada Research Chairs (CRC)

MEASURING WHAT CANADIANS VALUE

KEY DATA PRIORITIES

Table 1. **First wave—priority indicators for pan-Canadian implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Financing	Financing of PSE R&D	By source of funds and major areas of research, by type of PSE provider and by region	Statistics Canada
Performance	Percentage of GERD performed by HE/PSE sector		GERD HERD
HQP—stock	Number of doctoral holders (cumulative) per thousand population	By major areas of study—health, NSE, SSH	Statistics Canada
HQP—flows	Enrolments and completions by year	By institution, type of institution, level of study, field of credential (Health, NSE, SSH; split out MPT from NSE), region, gender	PSIS
Efficiency—HQP	Program graduation rate Time to completion	By institution, level and field of study	MCTU G-13
Commercial research outputs and outcomes	Licensed patents Spin-off companies Revenues	Research intensive institutions	AUCC AUTM Commercialization surveys (Statistics Canada)

Table 2. **Priority management and context data**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
GERD	R&D as share of GDP	For Canada, by province and by industrial sector	GERD
Personnel	R&D personnel	By sector, field of activity, gender and age cohort	Statistics Canada

Table 3. **Second wave—priority indicators for implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Labour-market outcomes (masters and doctoral)	Time to employment Employment rate—on graduation and after 2, 5 and 10 years Income—on graduation and after 2, 5 and 10 years	By credential, field of study, field of occupation, sector of labour market	NGS SED
Outputs from university research	Impacts Linkages	For NSE and health—Bibliometric indicators—citation data For all fields—bibliometric data on international linkages	Special studies
Brain drain and gain	Flows of doctoral holders into and out of Canada	By field of specialization, country of origin/destination, gender, age cohort	Special studies NGS-FOG, SED
The math, physics and technology challenge	Supply and demand for mathematics, physics and technology doctoral holders		NGS SED

Table 4. **Critical framework issues and data gaps to be addressed**

ISSUE	ACTION
Social outcomes and impacts of research	Need for an improved conceptual framework for measuring, and assessing the quality and contributions of PSE research, research training and knowledge transfer to prosperity wellness and quality of life
Reliable, timely and regular information on HQP	Sustainable funding to continue NGS-FOG and SED Support full implementation of PSIS Assess the feasibility to implement GPSS across all institutions with graduate studies
Reliable and disaggregated information on PSE R&D	Sustainable funding of PSE S&T surveys

ACRONYMS FOR INSTRUMENTS

PSIS	Post-secondary Student Information System
NGS	National Graduate Survey
NGS/FOG	National Graduate Survey Follow-up of Graduates
SED	Survey of Earned Doctorates
GPSS	Canadian Graduate and Professional Student Survey (Seven Canadian institutions participated in the survey with a number of U.S. institutions; survey instrument developed by the Massachusetts Institute of Technology and Duke Universities)
IP in HE	Survey of Intellectual Property Commercialization in the Higher Education Sector (Statistics Canada and Industry Canada)
AUCC data	Association of Universities and Colleges of Canada
	U.S. survey of commercialization
NSSE	National Survey of Student Engagement

OTHER ACRONYMS

R&D	Research and development
CCA	Council of Canadian Academies: the 2006 Report “The State of Science and Technology in Canada”
HERD	Higher Education Expenditures on R&D
GERD	Gross Expenditures on R&D
OECD	Organisation for Economic Co-operation and Development: International comparison data
MPT	Math, physics and technology
AUTM	Association of university technology managers (U.S.)
MCTU	Ministry of Training, Colleges and Universities
HE	Higher education
CFI	Canada Foundation for Innovation
CRC	Canada Research Chairs
CGS	Canada Graduate Scholarships
NSE	Natural sciences and engineering
SSH	Social sciences and humanities

03. Active, healthy citizenry

WHAT WE ARE TRYING TO ACHIEVE

- Optimize the benefits of post-secondary education for the health and well-being of Canadians and Canada—the larger social benefits
- Empower and enable individuals for well being in a changing world

POLICY ISSUES

- Linkage of PSE attainment and PSE R&D investments with increased social capital—especially as captured through health and well-being for individuals and society at large
- Linkages of expenditures on and increased participation in PSE and social cohesion and active citizenry
- Linkages of expenditures on PSE and improved individual health status and reduced societal health-care burdens
- Public opinion regarding the value and relative importance of different outcomes of PSE

RESEARCH QUESTIONS

Understanding the linkages with PSE

There is increasing evidence that education, including PSE, has wide-ranging effects on various social outcomes, e.g., civic participation, health status and longevity and reduced criminal activity. What are the pathways by which this occurs and the specific effects of PSE? Does PSE enable people to be more adaptable to changing circumstances?¹⁰

Citizenship

What is the relationship between the level of educational attainment and individual and collective well-being, e.g., the discussion around successful societies? How is this manifest in society, e.g., in voting behaviour, volunteering and giving, stronger social cohesion and tolerance? Are more educated individuals more or less trusting of institutions and the professions attached to these, such as the political system, the judicial system and the medical system?

Health

What is the relationship between level of educational attainment, reduced disparities in individual health status and reduced costs of social and health-care services?

Effective practices

What practices and innovations within the PSE sector contribute to enhanced social outcomes and how could these experiences be enhanced? Consider for example:

- The introduction of learning communities within PSE (learning environments outside the classroom, such as in residences). The National Survey of Student

Engagement has connected these environments to the quality of education received, and the persistence and retention of PSE students. How can best practices in communities of learning be measured?

- Service Learning is a growing aspect of many universities. Student participation in service learning is one of the few formal ways that students gain experience in volunteerism. The number of students who participate in service learning could become a key benchmark of institutional commitment to communities and to students' roles as engaged individuals.

Pathways of influence; measurement issues

How does one define civic and social engagement, what are the pathways through which it is learned and exercised? And how should it be measured, especially as the historical, cultural and economic context may preclude simple regional and international comparisons? Examples of valuable lines of research that could be pursued with appropriate access to data are:

- The question of the correlation of voting patterns with PSE attainment—Is this a financial status issue or another factor introduced by PSE?
- Community involvement as measured by participation in not-for-profit voluntary organizations and activities, which may vary enormously by age.

Participating in the international discussion

The second phase of the OECD Centre for Educational Research and Innovation (CERI)-Network B project on social outcomes of learning can be expected to provide suggestions for indicators from existing sources.

DATA STRATEGY ISSUES

- There is a need for a new conceptual framework and set of indicators that addresses the social dimensions of the outcomes and impacts of PSE.¹¹
- Existing data sets, e.g., the World Values Survey could be exploited more effectively.
- There are significant opportunities for partnerships with various federal agencies to develop further the notion of social benefits from PSE participation. Among potential partners are Health Canada, Elections Canada, Citizenship and Immigration Canada and the Social Sciences and Humanities Research Council.

FUTURE DATA EXPECTATIONS

Social outcomes

- Behavioural outcomes disaggregated by level of qualification received (e.g., certificate, diploma, degree) by type of institution (e.g., University, Community College, Private Trade School) and by province
 - Voting patterns
 - Percentage of population donating to charities, average amount donated
 - Percentage of population volunteering for community activities
 - Criminal activity
- Knowledge and trust outcomes disaggregated by level of qualification received (e.g. certificate, diploma, degree) by type of institution (e.g, University, Community College, Private Trade School) and by province (General Social Survey, GSS)
 - Social capital
 - Trust placed in neighbours and the police

Health outcomes

- Health outcomes disaggregated by level of qualification received (e.g., certificate, diploma, degree) by type of institution (e.g., University, Community College, Private Trade School) and by province
 - Real and perceived health status
 - Average age of mortality
- Health system impacts disaggregated by level of qualification received (e.g., certificate, diploma, degree) by type of institution (e.g., University, Community College, Private Trade School) and by province
 - usage and intensity of health services
 - average cost of health expenditure

Innovative practices

- Service learning and community engagement
 - Number and percentage of students participating
 - Recognition of learning experience through course credit (percentage)
 - Influence of that experience on employment choices

KEY DATA PRIORITIES

Table 1. **First wave—priority indicators for pan-Canadian implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Health status	Real and perceived health status Life expectancy	By educational attainment level, age cohort, region	CCHS, NPHS
Health system burden	Use of health care system	By educational attainment level, age cohort, region	CCHS
Charitable giving	Percentage donating Average donation	By educational attainment level, age cohort, region	LAD SHS
Voting behaviours	Likelihood of voting		CSGVP, SCAL

Table 2. **Priority management and context data**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Public opinion	Attitudes toward the impact of PSE	Population samples	Opinion surveys (various)
	Importance of PSE for social capital		

Table 3. **Second wave—priority indicators for implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Tolerance	Acceptance of diversity	By education attainment level, age cohort and region	Various surveys WVS
Trust	Trust in police Trust in neighbours and community	By education attainment level, age cohort and region	WVS
Student exposure	Percentage of student population engaged in community learning activities. Percentage of credentials awarded for community learning	By program, field of study, credential level, type of PSE provider	Not collected

Table 4. **Critical framework issues and data gaps to be addressed**

ISSUE	ACTION
New social framework and indicator sets over time	Integrate outcomes of work of OECD CERI-Network B project on social outcomes of learning Revised content of next GSS cycle on social capital to integrate outcomes of the OECD work with an over-sample of immigrants Assess the feasibility to implement NSSE in all PSE institutions
Exploit existing sources	Commission work on outcomes of World Values Survey, including the issue of indicators of “happiness”
Lack of information on linking health and learning	Further analysis of the new health literacy data from ALLS Linking health-related databases (CIHI) with learning/education information at small area levels (Statistics Canada, small area estimates of literacy)

ACRONYMS FOR INSTRUMENTS

NGS	National Graduate Survey
NSSE	National Survey of Student Engagement
PCSCS	The Pan-Canadian Study of College Students modelled on the U.S. CCSSE
WVS/ESS	World Values Survey/ European Social Survey
GSS	General Social Survey (for measures of social capital and other related topics)
CCHS	Canadian Community Health Survey
NPHS	National Population Health Survey
LAD	Longitudinal Administrative Data
SHS	Survey of Household Spending
CSGVP	Canada Survey of Giving, Volunteering and Participating
SCAL	Survey of Canadian Attitudes toward Learning
ASETS	Access and Support to Education and Training Survey
ALLS	Adult learning and lifeskills survey

04. Quality PSE

WHAT WE ARE TRYING TO ACHIEVE

- Delivery of uniformly high-quality post-secondary education with the result that Canadian PSE institutions, learners, programs, learning environments, learning outcomes and credentials compete with the best in the world.
- Commitment to continued improvement¹²

POLICY ISSUES

- Understanding the nature of quality in PSE
- Accreditation and assessment of quality in PSE
- Linkages of quality of learning opportunities, individual PSE attainment and outcomes
- Overall system functioning, including human-resource issues, quality and efficiency of provision and the attainment of credentials
- Mobility of credentials between levels of PSE
- Understanding the link between teaching excellence and innovation and learning outcomes (the scholarship of teaching and learning)

RESEARCH QUESTIONS

Human resource issues

Quality of PSE faculty, sufficiency (e.g., in relation to student numbers) and sustainability (e.g., in relation to institutional capacity to attract and retain students) are key issues for which there is a paucity of data and relatively little analysis of critical issues that could inform policy and investment decisions. At the moment, data on full-time university faculty levels are not current, there are no recent data on sessional/part-time university faculty, and there are no recent data on full-time or sessional/part-time community-college faculty. The data gaps are even more pronounced for private providers. To what extent are current faculty demographics and hiring patterns providing for system quality and sustainability? Anecdotally, there are reports of field-specific issues with respect to attracting quality faculty (e.g., business schools) deriving from the forecast competition from the U.S. over the next five to 10 years. But without a robust pan-Canadian data source, conducting policy analysis and exploring policy impacts is compromised.

Quality as efficiency of the system

There is a need to understand better the dynamics of attrition and completion (e.g., the time to completion and graduation rates) as they relate to the program of study, and socio-economic status of learner. Of equal interest is who drops out, why, where they go and whether they return and complete their credential later or elsewhere? Why are there gaps in male and female participation and completion?

Quality through innovation and quality teaching

What are the key factors affecting quality of student learning and learning outcomes? Most importantly, there is a need for a major investment in the scholarship of teaching and learning that will create better measures of learning outcomes.

Quality as student engagement

Moves to implement measures of student engagement and attainment (e.g., as assessed by the National Survey of Student Engagement), and increased investment in the assessment of the data and the factors for success (e.g., Community College Survey of Student Engagement) are very encouraging. But a lack of broad implementation and a lack of common formats for public reporting of the data diminish the potential benefits for learners, institutional management and policy-makers. We should also consider quality as the application of student learning to social issues. For graduate and professional programs, the Graduate and Professional Student Survey (GPSS) is increasingly being used by institutions, but faces the same issues of a lack of standardized modes of reporting. How many students are participating in international exchanges or international language programs to enhance their exposure to global issues?

Quality as external recognition of the quality of programs and credentials

Does the lack of pan-Canadian accreditation make a difference in quality? Canada is unique in the top 30 OECD countries in not having a formal PSE accreditation system of programs and post-secondary institutions. While the nature and quality of degrees from Canadian institutions are widely accepted, diplomas and certificates do not enjoy the same uniformity of interpretation. One exception is the Red Seal trades accreditation pan-Canadian standards. How is this manifest in mobility of credentials among institutions and regions, including international recognition?

Private providers

What quality assurances should the state provide and how are these to be monitored effectively? Without quality assurances, is buyer beware a sufficient policy when the state provides financial assistance to learners?

DATA STRATEGY ISSUES

- Promote common data standards and standardized comparable modes of reporting of performance data that are collected at institutional levels. While the level of performance and accountability reporting has increased dramatically over the last decade, the lack of consistency in definitions and reporting standards is problematic.
- There is a lack of timely nationally comparable data on faculty and student numbers across all components of the PSE sector.
- There is a need for a unique identifier number assigned to students that will allow tracking of learners through different institution and regions.

FUTURE DATA EXPECTATIONS

Institutional and program recognition by PSE providers (including private providers)

- Number of accredited institutions
- Number of accredited programs
- National/international recognition of credentials

Faculty—quality, sufficiency and sustainability

- Current and timely data on faculty numbers, field, gender, qualifications and age cohort (FT and sessional/PT instructors) across all PSE providers (university, college and private providers)
- Age of faculty in relation to the labour force (time series)
- Student to faculty ratios, by institution, PSE sector, field of study, time series and trends are important
- Data on use of sessional/part-time faculty instructors in PSE sector
- Annual rates of new faculty and instructor hires by institution type, credential levels and program of study current and projected
- Forecast shortfalls of doctoral degree recipients by field of study

Learner persistence and achievement/outcomes

- Credentials attained: by level and type of PSE provider; as percentage of the population annual and accumulated
(Note: definitional challenge)
- Employment rates six months and 12 months after graduation by institution, program and gender
- Program graduation rates: by institution, gender, socio-economic background and program of study, including direct-entry and second-entry programs
(Note: definitional issues; considerable experience among G-13 and in certain provinces with measurement issues)
- National graduation rates: total number of graduates per population at typical age of graduation
- Attrition and transfer rates: By institution, gender and program of study. Ideally with a unique student identifier one could look at the system dynamics—what percentage of students who start in any given year continue PSE at a different institution or left PSE completely within a given time frame.
- Non-completers: average time to drop out by institution, program of study and gender

Quality of student engagement and satisfaction—Canadian refinement and application of existing tools like National Survey of Student Engagement (NSSE) and the Collegiate Learning Assessment (CLA)

- Student satisfaction with learning experiences (National Graduate Survey, NGS).
- Measures of the quality and effectiveness of post-secondary education (e.g., level of academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences, supportive campus environment). This could be done through pan-Canadian implementation of Canadian-adapted versions of the National Survey of Student Engagement and the Collegiate Learning Assessment
(Note: many institutions are now using these tools.)

Learning outcomes—New tools required

- Using the institution or program as the primary unit of analysis, direct measures of the value added of the learning experiences as they pertain to key factors central to college and university-level education (e.g., critical thinking, analytic reasoning and written communication modelled on the U.S. Collegiate Learning Assessment tool)
- Indicators that link the institutional learning provision to the incremental or value-added learning and employment outcomes for learners (to avoid simply measuring the quality of student entries to PSE).

MEASURING WHAT CANADIANS VALUE

KEY DATA PRIORITIES

Table 1. **First wave—priority indicators for pan-Canadian implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Attainment	Number and type of credentials per year National graduation rates (degrees)	Numbers by type of credential, type of PSE provider, field of study, gender, age cohort, SES status and sub-population. By degree level and year	Data reported to Statistics Canada by institutions PCEIP
Efficiency	Program graduation rates—percentage within scheduled time to completion Median and longest time to completion—years (or months) Drop out and transfer rates—percentage of starting cohort Each by year	By PSE institution, type of PSE provider, field of study, gender, age cohort, socio-economic status and sub-population <i>Note— Ministry of Training, Colleges and Universities uses graduation within seven years of an entering cohort of students for graduation rate data</i>	In Ontario, graduation rates are reported by all universities (required by Ministry of Training, Colleges and Universities)

Table 2. **Priority management and context data**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Faculty resources	Faculty numbers—full-time and part-time and/or sessional Age of faculty relative to labour force	By institution, field, type of PSE provider, gender, qualifications and age cohort (full-time and sessional/part-time instructors) By program, type of PSE provider, region	UCASS (full-time university faculty only)
Student population	Student numbers—full-time and part-time Average entering grades of first year students	By institution and type of PSE provider By institution and type of PSE provider. Contextual data for use in assessing institutional value added	PSIS (in part) G-13 collect such data

Table 3. **Second wave—priority indicators for implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Sufficiency of faculty	Full-time student: full-time faculty ratios Shortfalls in doctoral production	By faculty, institution, type of PSE provider By field of study	Data not available for institutions other than universities
Student satisfaction	Measure of student satisfaction with learning experience Need to evaluate the promising use of NSSE, CCSSE and CLA as they move to assess value-added of PSE experience	By level of credential, institution, type of PSE provider	NGS (every 5 years) GPSS
Quality of learner engagement	Level of academic challenge Active and collaborative learning Student-faculty interaction Enriching educational experiences Supportive campus environment	By institution, benchmark families of like institutions, and type of PSE provider	NSSE and U.S. CCSSE used fairly widely MTCU requires Ontario universities to publish
Formal recognition	Number of accredited institutions Number of accredited programs	By type of PSE provider By type of PSE provider	

Table 4. **Critical framework issues and data gaps to be addressed**

ISSUE	ACTION
Unique learner identifier	Support implementation of a unique student identifier to be used across Canada—will allow lifelong tracking of learners among PSE providers and among students who move among programs, institutions and regions of Canada
Standardized terminology	Clear data definitions and standards for degree, diploma and certificate Also definitions needed for full-time and part-time students and faculty
Lack of timely and regular data on faculty and student numbers	Support full implementation of PSIS Expansion of PSIS for private providers
Improve tracking of graduates	Refine NGS a) extend longitudinal coverage to 10 years, e.g., samples 2, 5 and 10 years; b) increase frequency—move to every 3 years

ACRONYMS FOR INSTRUMENTS

NSSE	National Survey of Student Engagement
PCSCS	The pan-Canadian Study of College Students modelled on the U.S. CCSSE
CCSSE	Community College Survey on Student Engagement (U.S.)
NGS	National Graduate Survey
GPSS	Canadian Graduate and Professional Student Survey (Seven Canadian institutions participated in the 2005 survey with a number of U.S. institutions; survey instrument developed by the Massachusetts Institute of Technology and Duke University)
UCASS	University and College Academic Staff Survey
CLA	Collegiate Learning Assessment (U.S.)
PSIS	Post-secondary Student Information System
CUSC	Canadian Undergraduate Survey Consortium
PCEIP	Pan-Canadian Education Indicators Program

OTHER ACRONYMS

MTCU	Ministry of Training, Colleges and Universities (Ontario)
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05. and 06. Access and opportunity for Canadians and participation and success of under-represented groups

WHAT WE ARE TRYING TO ACHIEVE

- That Canadians have equitable opportunities to access and benefit from post-secondary education, whatever their economic and social background. The ultimate goal is to ensure that Canadians have an opportunity to fulfil themselves through learning and that Canada has the skilled labour supply and educated citizenry necessary to prosper in a changing world.
- Understanding and improving the participation and persistence of groups under-represented in PSE is a priority as this will lead to greater social cohesion. Key target groups are Aboriginal youth, youth from lower income families, first-generation PSE learners and learners with disabilities

POLICY ISSUES

- Dynamics and trends in PSE participation and persistence
- Understanding why some groups are under-represented in PSE, including barriers to PSE access and persistence
- Effectiveness and efficiency of policy and program interventions
- Capacity of PSE institutions to deliver on expectations
- Importance of PSE education and training for the new economy; impact of disparities in educational attainment on Canada's social and economic prospects
- Suitability of information and feedback for an effective matching of students with programs and institutions
- The linkage between education and the preservation and enhancement of various cultural values and groups, and the extent to which the faculty and staff at PSE institutions are broadly representative of the diversity of Canadian society.

RESEARCH QUESTIONS¹³

Trends

What are the most recent trends in Canadian and regional PSE participation, persistence and attainment in comparison with other nations and in the context of Canadian population demographics. Do the international differences matter and why?

Under-represented groups

What do we know about which groups are under-represented in PSE and/or at risk in PSE attainment. How do we obtain insights on who does not attend PSE and why? Key target groups that are known to be under-represented and need to be tracked (time series and regional distribution) in the context of a pan-Canadian data base on access and attainment:

- Aboriginal learners
- Learners from low-income families
- First-generation PSE students
- Males (and females in a limited number of program areas)
- Learners with disabilities, physical and learning
- Certain immigrant ethnic groups

Factors/determinants

What evidence do we have concerning the determinants of PSE participation and attainment by the learner population in general, and these under-represented groups in particular—and what does this mean for interventions that could make a difference? Recent work by Statistics Canada¹⁴ has revealed that the large gap in university attendance by family income can be accounted for by differences in a limited number of observable characteristics. These would benefit from further research to identify effective modes of intervention: cognitive achievement at age 15 (e.g., as shown by standardized test scores in reading), parental influences, and high-school quality. In contrast, financial constraints are a relatively minor factor, but may be significant in certain circumstances for some segments of the learner population (e.g., rapid deregulation of fees for professional programs). Some specific issues to consider:

- **Academic preparation and transition** Given the link between academic performance in high school and later participation in post-secondary education, what are the factors for success in K-12 education and for

effective transitions to PSE? Why do students from lower-income families tend to perform more poorly on standardized and scholastic tests than students from higher-income families? Are standardized tests culturally biased? The pre-PSE pipeline is of particular importance for addressing the under-representation of aboriginal youth in PSE¹⁵. Are there undue barriers (academic, financial, attitudinal) in transitions among PSE providers?

- **Gender gap** What are the factors underlying the gender gap in PSE, what are the opportunities for efficient and effective intervention and what are the sociological effects of current trends?
- **Interest and motivation** What do we know about the impact on participation and persistence of such factors as information on PSE, perceived personal benefit, supportive networks, educational attainment of the learner's parents, the learner's career objectives, and the counter-pull of the labour market. What does this reveal in terms of opportunities for cost-effective interventions?

Apprenticeships and trade programs

What do we know about student choice to access such programs and the reasons for early dropout?

Higher-level PSE participation

What are the trends in participation and attainment levels, both for the population at large and for under-represented groups, in higher-level and second-entry programs (e.g., some professional and graduate programs). A recent OECD study revealed that the share of doctorate holders in the population or labour force is two or three times larger in Germany and Switzerland than in Australia, Canada and the United States. Canada also has an older population of doctorate holders than Europe and this population is still aging. Is this a policy issue?¹⁶

Modes of facilitating access

- **Among PSE institutions** What is the extent and efficiency of credit transfer and recognition, including among different PSE providers and different jurisdictions? This includes the provision of innovative joint programs.
- **Prior Learning Assessment and Recognition (PLAR)** What is the extent and efficiency of use among different PSE providers of formal systems to recognize prior and experiential learning (PLAR)? Should there be a pan-Canadian PLAR system?
- **E-learning** To what extent is e-learning being implemented and is it successful in supporting quality learning outcomes? What are the factors for success? What are the costs and benefits of e-learning?

System capacity

What is the capacity of the PSE system to deal with forecast demographic pressures, and changing learner and societal expectations:

- **Financial** What is the adequacy of funding levels and efficiency of delivery of the various sectors of the PSE system?
- **Faculty complement** Adequacy and sustainability of faculty (see section on affordability).
- **Articulation agreements among PSE providers** To what extent are there effective articulation agreements among PSE providers, in particular recognition of credentials and learning outcomes?
- **Flexibility of delivery** To what extent is the overall PSE system flexible, willing and able to adjust to changes in demand and expectations?
- **Learner support** To what extent are retention in the PSE system and learning outcomes affected by student support services and peer networks, teaching & learning services, student housing, communities of learning in residences, etc?

DATA STRATEGY ISSUES

- Among all PSE providers, there is a problem with significant data gaps and time delays in releasing data on student and faculty numbers. There is a particular problem in obtaining relevant data on Aboriginal learners to inform policy and practice. What is the best way to attain the full collaboration and engagement of aboriginal communities to obtain meaningful and comparable PSE data?
- Data consistent with international standards (e.g., OECD Education at a Glance) are not available in a timely fashion.
- Lack of a pan-Canadian student identifier impedes systematic tracking of students among components of the education system.
- More systematic longitudinal data are required to track pathways between K-12, various components of PSE, and the labour market. However, most recent Youth in Transition Survey cohorts are promising.

FUTURE DATA EXPECTATIONS

Core baseline reference data on potential stocks of PSE learners—time-series data on secondary school students, including high-school attainment levels and dropout rates of learners by (with selective surveys to allow assessment of linkages among issues):

- Socio-economic status
- Gender
- Status—Aboriginals (on reserve and urban), immigrant
- Geographical location—rural/urban
- Educational participation and attainment level of parents
- Scores on standardized tests (especially reading)
- Unique student identifier for tracking

Also, how effective are the linkages between secondary schools and the range of PSE providers in providing effective information for choice by the potential PSE students? What interventions work to facilitate transitions?

Core data on participation in PSE—Time series enrolment data by age cohort, gender, level and mode of study, program, level of study, institution and type of PSE provider.

Core data on flows—persistence and attainment in PSE—Time-series PSE data that reveal trends and that can be disaggregated by under-represented groups and various critical factors, including:

- PSE participation by program and level of PSE credential in relation to the general population and to PSE enrolments
- Graduation rates
- Attrition and transfer rates
- Non-completers—characteristics and rationale
- Part-time students
- Drop-ins and dropouts/returnees
- Apprenticeship completion rates

Selective surveys that explore key policy issues of relevance with respect to participation, persistence and attainment. Examples include:

- Gender differences in PSE participation by socio-economic status, labour-market conditions, region, program, etc.
- Data on parental influences, and other socio-economic background characteristics across the income distribution.
- Multiple influences of financial and non-financial factors.
- A meaningful set of data on aboriginal participation and attainment in K-12 and PSE education.

Data on PSE sector functions

- Selective surveys on credit transfer, PLAR and e-learning (routine data collection likely not a cost effective approach)

System capacity measures

- Time-series data on financial and human **resources invested per student** by institution and PSE provider class. This would provide the basis for opportunity-cost analysis.
- **Annual expenditures** on PSE relative to GDP by PSE provider class.
- **Faculty/student ratios** with capacity for disaggregating into full-time and part-time/sessional faculty.
- Time-series data on the **relative proportion of public and private expenditure** on PSE.

KEY DATA PRIORITIES

Table 1. **First wave—priority indicators for pan-Canadian implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
PSE enrolment	Numbers enrolled in PSE Participation rate within 20-25-year-old cohort	By institution, type of PSE provider, gender, level and mode of study (e.g., distance), program, level of study, age cohort, socio-economic status, sub-populations	PSIS (incomplete)
Under-represented groups	Comparative participation rates	Time series and regional distribution by under-represented groups <ul style="list-style-type: none"> • Males • First Nations • Disabled • Low socio-economic status • Low PSE attainment by parents 	PSIS
PSE attainment	PSE attainment level (highest)	Canadian population and working-age population by region; including sub-populations	Statistics Canada Education at a Glance (OECD)
Doctorate holders	Percentage of population holding doctorates	Percentage of population holding doctorates by field and by age cohort International benchmarks	

Table 2. **Priority management and context data**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Stock of direct entrants from secondary school	Number and percentage of secondary students completing Drop out rates Scores on standardized tests	By region, socio-economic status, gender, region, urban/rural, including under-represented groups	Education at a Glance (OECD)
PSE participation	PSE participation rate	By type of PSE provider Percentage of population enrolled in PSE by type of PSE provider and age cohort	PSIS
Public opinion	Perceived opportunity to attain credential Perceived adequacy of student support services	By type of PSE provider, region, sub-group	Opinion surveys
Resource base	Faculty/student ratio Operating funds per full-time equivalent student		PSIS UCASS

Table 3. **Second wave—priority indicators for implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Technology—mediated learning	Number of courses given online Number of credentials available by distance learning	All PSE providers by type	Not collected
Student services	PSE institutional outreach to secondary schools PSE institutional investment in student services Student satisfaction with student services Institutional student aid per FTE student and as percentage of operating budget	By type of PSE provider	Not collected
PLAR	Active PLAR initiatives	By region	Inadequate instruments

Table 4. **Critical framework issues and data gaps to be addressed**

ISSUE	ACTION
Unique student identifier	Support pan-Canadian implementation
Research insights	Factors underlying the under-representation of some groups and in some areas of study
Lack of longitudinal information	Further analysis of the new education and training module of SLID Further analysis of YITS and LSIC
Lack of information on transitions, persistence and attainment in PSE, overall and by under-represented groups or regions	Sustainable funding of NGS/FOG/SED Support full implementation of PSIS Support funding for the new proposed ASETS Assess the feasibility to implement an equivalent BPS from the U.S., (i.e., follow-up institution-based survey with students at different cycles) Prepare analysis plan for the new revised education content of 2006 Census (to be released in 2008)
Lack of timely and regular information on PSE “stocks”	Support full implementation of PSIS

ACRONYMS FOR INSTRUMENTS

YITS	Youth in transition survey (Statistics Canada)
SLID	Survey of Labour and Income Dynamics
NGS FOG	National Graduate Survey Follow-up of Graduates
PISA	Program for International Student Assessment
EAG	Education at a Glance
PCEIP	Pan-Canadian Education Indicators Program
OECD	Various data sets
LFS	Labour Force Survey
PSIS	Post-secondary Student Information System
UCASS	University and College Academic Staff Survey
CAUBO	PSE Finances (Association of Canadian Community Colleges and other PSE providers)
LSIC	Longitudinal Survey of Immigrants to Canada (Statistics Canada)
ASETS	Access and Support to Education and Training Survey
BPS	Beginning Post-secondary Students
	Various surveys carried out by the Millennium Scholarship Foundation

OTHER ACRONYMS

OECD	Organisation for Economic Co-operation and Development
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07. Lifelong learning

WHAT WE ARE TRYING TO ACHIEVE

- That Canadians, established and new, are able to fulfil their potential in a changing labour market and society. That they can access adult education and training that is relevant and responsive to their interests and needs; and that there are emergent opportunities in the labour market and available in every community (not necessarily face-to-face).
- That there is increasing engagement of all PSE providers in adult education; and increasing investment by employers in adult education.

POLICY ISSUES

- Linking adult education and training with the labour market—Informing adult education and training opportunities according to workforce needs and ensuring adult-learner access.
- Who provides? Which PSE providers are the most suitable for what needs.
- Who pays? What is the role and share of investment by learners, governments and employers?
- Who participates? What is the extent of access by adult learners; immigrants; other sub-populations?
- What are the outcomes? What are the credentials/qualifications and mobility of those credentials?
- Public policy issues: linkage of employment insurance (EI) and welfare with adult education and training.

RESEARCH QUESTIONS

Linkages with the labour market

To what extent does distance education meet the needs of adult learners and their employers? How can those linkages be strengthened to ensure timely and relevant education and training offerings?

Who provides

Who is best able to meet the adult education needs of workers in all sectors and of sub-populations (e.g., immigrants and First Nations)? How many adult learners prefer face-to-face learning and what is the cost/benefit relationship between the alternatives? Continuing education offered by universities and community colleges is ubiquitous. To what extent do these courses meet the needs of adult learners in the workplace and in citizenship?

Who pays

What are the sources of support for adult education? What is the extent and what are the trends of employer investment in adult education and training? To what extent does student assistance support adult education? What incentives are most effective for adult education in the workplace?

Who participates

What percentage of the workforce accesses adult education and training per year and during a working life? How is access facilitated? Are the workers in

need actually targeted and participating? How successful has prior learning assessment and recognition (PLAR) been in removing the barriers to recognition of credentials from private trainers, colleges and universities and courses offered in house? In addition to cost, what other barriers to education are perceived by potential adult learners (especially those not in the workforce)? What incentives work for the learner?

What outcomes, how effective

What do we know about the outcomes and impacts of adult education and training? With respect to credentials, what percentage of these courses are offered for credit and how much does this matter to potential learners? Can there be common definitions established for certificates and diplomas awarded by post-secondary institutions?

Quality

What is the quality of the training provided by PSE institutions, and do participants continue to value this training five years out? Is there a perceived difference between the quality and applicability of training provided in house within organizations and that provided by PSE institutions? To what extent have partnerships between private-sector organizations and post-secondary institutions increased the transferability of credit recognition? What role do professional and trade associations play in mediating

these relationships? What approaches have been the most successful, especially in assisting the move of unemployed participants to employed status?

Value added

To what degree does learning for adult learners create social impacts? Is it fundamentally transformational?

Adult literacy

What are the trends in adult literacy within the labour market and how well are adult education and training opportunities addressing the challenges of adult literacy?

Public policy issues

Should there be a formal linkage of Employment Insurance and Welfare with adult education and training? Should there be expectations for participation in adult education as a condition for welfare and EI recipients?

DATA STRATEGY

- Much information has been generated by the Adult Literacy and Lifeskills Survey (ALLS), International Adult Literacy Survey (IALS), Pan-Canadian Education Indicators Program (PCEIP), Adult Education and Training Survey (AETS). A predominant conclusion to be drawn from these data is that the persons who need adult education the most are those least likely to be the beneficiaries from the status quo. This should be the focus of future data-collection activities.
- Future data collection and future programmatic interventions should emphasize those in Levels 1 and 2 of the International Adult Literacy Survey (IALS)(approximately 42% of the Canadian Labour Force).

FUTURE DATA EXPECTATIONS

The following are additions to many of the measures of affordability specified in section 8

Labour-market linkages

- Employer satisfaction with adult education providers other than in-house providers.

Provision

- Percentage of adult education provided by the various PSE providers.
- Reasons for unmet need—learners and employers.

Participation

- Participation rate in adult learning (annual data)
 - Percentage of the adult population (16 to 65 years) receiving adult education and training in a specified time frame; data by program or credential, prior educational-attainment level, gender, region, sub-population (annual data, time series for trends).
 - Percentage of labour force receiving formal on-the-job training by labour-market sector and organization size.

- Number of job-related certificates and diplomas held by workforce (16 to 65 years), by labour-market sector.

Outcomes

- Adult literacy levels by sector, region and time series.
- Satisfaction with outcomes of adult-education courses and programs; particularly targeted at those unemployed or underemployed at the time of participation.
- Labour-market outcomes—labour-market status (including movements in and out of the labour market) of participants in adult education compared with overall population.

Financing

- Sources of support for adult education (government, learner, employer) by labour-market sector, gender, prior educational attainment. International benchmark.
- Employer financing of work-related training—expenditures and share of payroll, by labour-market sector, and company size, including focus on small- to medium-size enterprises (SMEs).

KEY DATA PRIORITIES

Table 1. **First wave—priority indicators for pan-Canadian implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Literacy	Adult literacy—OECD levels	Population aged 16 to 65	ALLS
Participation	Participation rate in adult education Percentage of labour force receiving formal job-related training	Population aged 16 to 65 years receiving adult education and training in a specified time frame; data by program or credential, prior educational attainment level, gender, region, sub-population By labour-market sector; and organization size	AETS SLID
Provision	Percentage of adult education provided by type of PSE provider	By region	PSIS
Financing	Sources of support for adult education	Employer, learner, government; by labour-market sector, gender, prior educational attainment	ALLS

Table 2. **Priority management and context data**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Attainment	PSE attainment levels of adult population in Canada	By type of PSE credential, gender, region	Statistics Canada

Table 3. **Second wave—priority indicators for implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Credentials	Number of job-related credentials	Workforce (16 to 65 years), by labour-market sector	AETS
Financing	Employer financing of work-related training: expenditures and share of payroll	By labour-market sector, and company size (include focus on small- to medium-size enterprises)	Inadequate instruments
Satisfaction	Learner and employer satisfaction with adult education	By labour-market sector, target vulnerable sectors	AETS

Table 4. **Critical framework issues and data gaps to be addressed**

ISSUE	ACTION
Need to enhance outcomes and impacts	Need a conceptual framework on factors for success in adult education and metrics to assess what works best under what circumstances
Lack of regular information on adult learners	Sustainable funding of collecting adult learning (e.g., new training/education module of SLID) Funding for the new proposed ASETS Funding of the new proposed OECD adult skill survey (PIAAC)
Lack of understanding of the low participation in learning of adults with lower skills	In-depth analysis and dissemination of the recent survey on the Level 1-2 of IALS
Lack of information on financing of adult education	Sustainable funding for WES Revised survey content on WES to include information on how employers support adult learning

ACRONYMS FOR INSTRUMENTS

ALLS	Adult Literacy and Life Skills Survey
IALS	International Adult Literacy and Lifeskills Survey
AETS	Adult Education and Training Survey
PCEIP	Pan-Canadian Education Indicators Program
WES	Workplace Employee Survey
PIAAC	Program for International Assessment of Adult Competencies
SLID	Survey of Labour and Income Dynamics
PSIS	Post-secondary Student Information System
ASETS	Access and Support to Education and Training Survey

08. Affordability

WHAT WE ARE TRYING TO ACHIEVE

- That post-secondary education be affordable for learners and for Canadian society. The level of tuition fees charged needs to provide value for money in all areas of PSE.
- That finances not be a barrier to access and completion, no qualified learner should be denied the opportunity to undertake or complete PSE studies only for want of financial means.
- That the overall PSE sector be cost-effective and sustainable and able to attract and retain top-quality faculty and students, and provide them with high-quality resources and a suitable physical environment for teaching, learning, research and community service.

POLICY ISSUES

- Public perception of affordability for learners and cost-effectiveness of the sector
- Public and private returns on PSE
- The impact of costs on access and program choice
- Sources of income for learners' education and living costs
- Modes of public subsidy
- Student debt and debt repayment
- The perceived and real return on investment of private training programs
- Financing for the PSE sector
- Cost-efficiency and sustainability (physical and human resource base) of PSE institutions
- Adaptability of the PSE sector to meet emerging challenges
- International competitiveness of the PSE sector for recruiting and retaining talent

RESEARCH QUESTIONS

Costs of PSE and sources of income for PSE learners

What are the real costs of PSE and the sources of income available to learners for different programs, in different regions of Canada and diverse learner groups, with the data disaggregated for under-represented groups. To what extent are learners and their families fully aware of and planning for the real costs and sources of financing for PSE?

Affordability

What is the evidence for real financial barriers to access and persistence, in particular for students from under-represented groups and from different regions of Canada? There is a need to disentangle the relative impacts of price constraints (cost are perceived as higher than benefits), cash constraints (the availability of money to pay for the costs), and debt aversion and explore the consequences of these impacts for policy. The Canada Millennium Scholarship Foundation has published extensively in this area.

Differential impacts

What is the impact of high-cost differential tuition fees on student enrolment, especially for under-represented groups?

Limits to private support

Is there a definable maximum proportion or percentage of a university degree or college credential that should be supported by tuition fees?

Student debt

Understanding the impact of debt levels (individual and larger social impacts, e.g., delaying home purchase and family) and means of managing debt among learners. What is the impact of debt relief and interest reduction? Are disadvantaged groups using the sources of support at their disposal in an effective way? What are the costs and benefits of providing student aid to learners in programs managed by private providers without any form of accreditation? What proportion of student borrowers have a genuine problem paying their student debt, and what are the underlying factors for this problem?

Impacts of, and alternatives to, current approaches to student aid

What are the individual and social implications of the current balance of loans, bursaries and loan-remission measures for post-secondary students, especially for those most likely to face financial and other barriers before, during and after their post-

secondary studies? Who benefits from the various forms of PSE subsidies, e.g., grants, loans, income tax refunds? To what degree should the form of student assistance provided be influenced by student age and family circumstance, especially for adult learners? What can we learn from international experience and experiments, including international experiences with contingent loan-repayment schemes?

Revenues

Given recent and forecast trends for institutional revenue streams by PSE sector what are the implications for learners and for governments of the future balance of public and private shares of the cost of PSE? To what extent are the funding shares reflective of public and private benefits?

Financial sustainability of PSE institutions

How sustainable are PSE institutions in Canada? What is the short-term and long-term viability of the physical assets and core educational infrastructure,

e.g., libraries and computing and communications infrastructure? What measures are there of the long-term sustainability of the human resources and competitiveness of faculty and administrative (including student service) salary levels in an international context? What measures do we have of the sustainability of private training institutions given their different infrastructure and cost structures?

Impacts of research activity

What is the evidence, pro and con, that increased sponsored-research activity has negatively affected the capacity of institutions to deliver high-quality, cost-effective education?

Public opinion

To what extent is there public support for the current allocation of the costs of PSE between the public and private purse? Is affordability seen as a barrier to access?

DATA STRATEGY ISSUES

- Relevant data exist in various forms, but are not necessarily easy to access and compare among jurisdictions and PSE providers. The data strategy needs to acknowledge the fact that more systematic and comparable data collection and reporting should not result in increased response burden.
- There are very few data available for private providers. Should provision of data be a prerequisite for eligibility for student aid for students attending programs at these institutions?
- There are no reliable data on private training schools outcomes (short-term and long-term).

FUTURE DATA EXPECTATIONS¹⁷

The costs of accessing higher-education learning (time series by PSE sector and region, tuition disaggregated by program type for high-cost programs), comparisons with consumer price index

- Tuition: undergraduate and specialized programs
- Special fees (which may have substituted for caps on tuition fees)
- Books and ancillary educational supplies
- Living and transportation
- Childcare

Income sources available to and used by learners (time series by PSE sector, program and region including data disaggregated by under-represented groups)

- Employment while studying
- Parental support
- Repayable student loans (federal and provincial)
- Forgivable loans and bursaries
- Merit-based scholarships
- Co-op/apprenticeship programs

Student debt—Data by program, institution type and region (time series, including data disaggregated by under-represented groups), National Graduate Survey (NGS)

- Debt levels at graduation (percentage of population and those with debt)
- Repayment profiles (link with employment and earning status)
- Means of coping with debt

Learner and family attitudes to affordability

- Adequacy of information and understanding of costs and resources required
- Attitude toward debt (especially among under-represented groups)
- Impact of cost and debt on program and institution choice

Federal support for PSE

- Transfer payments (time series)
- Student support—Repayable (e.g., loans) and non-repayable (e.g., bursaries and scholarships)
- Tax incentives and benefits
- Sponsored research—Granting council (direct, indirect) and contract support

- Research training (scholarships)
- Other

Provincial support for PSE

- Operating grants to institutions
- Student support—Repayable (e.g., loans) and non-repayable (e.g., bursaries and scholarships)
- Sponsored research
- Other

Revenue sources and amounts for PSE institutions—time series by PSE provider, type of PSE provider and region.

- Macro level—Public and private expenditures on PSE (Pan-Canadian Education Indicators Program) by region.
- By institution—Operating costs and revenues¹⁸
 - Total costs
 - Revenues—Provincial operating grants
 - Revenues—Tuition (Canadian and international students)
 - Revenues—Other sources
- By institution—Sponsored research
- Revenue by full-time equivalent student—By institution

Expenditures and measures of sustainability—As percentage of operating costs and per full-time equivalent student.

- Amounts and types of expenditures, including:
 - Library expenditures
 - IT resources
 - Maintenance, modernization and infrastructure expenditures (also as percentage of building replacement costs)
 - Faculty and staff salaries
 - Student assistance
 - Research (e.g., as percentage of operating costs)
- Student services and assistance
 - Financial assistance counselling
 - Student assistance from the operating budget per full-time equivalent student
- Space indicators

Public perceptions

- Affordability
- Return on investment (labour-market and personal)
- Efficiency of the sector

MEASURING WHAT CANADIANS VALUE

KEY DATA PRIORITIES

Table 1. **First wave—priority indicators for pan-Canadian implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Expenditures on PSE	Public expenditures on PSE Private expenditures on PSE	By type of PSE provider, region, time series	CESC EAG HERD
Tuition	Tuition rates Tuition as a percentage of total costs to learner	By credential type, program of study, type of PSE provider, region, time series By level of credential and type of PSE provider and whether need to move from home base to access PSE program	Statistics Canada
Student debt	Debt level on graduation Time to repayment Default rate	By level of credential, PSE provider type, age cohort, gender and region By level of credential, PSE provider type, age cohort, gender and region and employment and income status By level of credential, PSE provider type, age cohort, gender and region and employment and income status	CSLP administrative data LAD NGS

Table 2. **Priority management and context data**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Institutional expenditure profiles	Salaries Maintenance and operations Library IT Student assistance	By institution, and type of PSE provider, region	Statistics Canada and CAUBO (incomplete)
Public opinion	Affordability—perceived and awareness of real costs Perceived return on investment	By type of PSE provider By type of PSE provider	Public opinion surveys

Table 3. **Second wave—priority indicators for implementation**

POLICY ISSUE	INDICATOR	COVERAGE	RELEVANT INSTRUMENTS
Student support	Sources of student support Levels of support Impact of cost and availability of non-repayable support on PSE program choice	By type of support, whether repayable, program of study, type of PSE provider, age cohort, sub-population High school leavers	YITS PEPS SED

Table 4. **Critical framework issues and data gaps to be addressed**

ISSUE	ACTION
Lack of comparable financial data	Harmonization of concepts and definitions for financial data Re-design institutional survey instruments to collect comparable financial data Further analysis of public account data
Lack of information on financing PSE learner	Support the funding of the new proposed ASETS survey Sustainable funding for NGS, SED

ACRONYMS FOR INSTRUMENTS

NGS	National Graduate Survey
SED	Survey of Earned Doctorates
HERD	Higher Education Expenditures on R&D (Statistics Canada)
GERD	Gross Expenditures on R&D (Statistics Canada)
CAUBO	Canadian Association of University Business Officers
YITS	Youth in Transition Survey
PEPS	Post-secondary Education Participation Survey (Discontinued, replaced by ASETS)
ASETS	Access and Support to Education and Training Survey
EAG	Education at a Glance
CESC	Canadian Education Statistics Council
CSLP	Canada Student Loans Program
LAD	Longitudinal Administrative Data
Various surveys and research carried out by the Millennium Scholarship Foundation	

Post-secondary Education Surveys

A. POST-SECONDARY STUDENT INFORMATION SYSTEM PSIS (FORMERLY ENHANCED STUDENT INFORMATION SYSTEM ESIS), ANNUAL

The Post-secondary Student Information System (PSIS), formerly the Enhanced Student Information System (ESIS), is a national survey that provides detailed information on enrolments and graduates of Canadian PSE institutions in order to meet policy and planning needs in the field of post-secondary education.

In 2001, it began to replace the University Student Information System (USIS), the Community College Student Information System (CCSIS) and the Trade/Vocational Enrolment Survey (TVOC) with a single survey offering common variables for all levels of post-secondary education. **Upon full implementation, PSIS will capture annually, enrolment and graduate information from Canadian public post-secondary institutions.**

PSIS collects information pertaining to the programs and courses offered at an institution, as well as information regarding the students themselves. PSIS also collects information on the program(s) and courses in which students were registered, or from which they have graduated. PSIS is further designed to collect continuing education data. This information is available from the PSIS Cross-sectional Files.

In addition, PSIS has been designed to provide longitudinal data. It creates a unique **longitudinal record** for each post-secondary student in Canada which will, in turn, provide a history of flows taken by a student as he/she progresses through the education system. **Upon commitment from post-secondary education institutions**, PSIS will become a means of following students throughout their academic careers in order to build a comprehensive picture of student flows—that is, their mobility and pathways within Canadian post-secondary education institutions.

Historical enrolment and graduate data from previous surveys have been converted using PSIS variable definitions and code sets to maintain the historical continuity of the statistical series.

Survey challenges

Responding to this survey is mandatory. Data are collected directly from survey respondents and extracted from administrative files: **Although it is mandatory, the survey suffers from lack of institutional compliance.**

The survey collects student administrative data files from post-secondary institutions: **Data is often not collected and reported in the format that is required by Statistics Canada which requires more work in cleaning and streamlining the data.**

The initial contact consists of a written data request via e-mail. Subsequent contacts are made via telephone, e-mail and possibly via an on-site visit with the respondent(s) at the institution(s): **Statistics Canada would like to implement an initiative that would assist institutions in the data collection exercise. However, this is not currently available at Statistics Canada. The department suffers from the lack of financial and human resources to assist institutions in the collection and reporting of PSIS data.**

The collection method used is electronic. It consists of sending electronic flat files compiled and validated by Statistics Canada's E7 Data Verification Application (E7-DVA). The E7-DVA is an application that is used to verify data and identify problems within an institution's input files before they are sent to Statistics Canada: **The survey framework has been changed, not all institutions have aligned their data collection with the new survey framework.**

Respondent follow-up procedures used are contacting institution(s) via telephone or e-mail: **Long process requires unduly long periods of time, decreasing the value of the information.**

Until fully integrated into PSIS reporting, some respondents still report on questionnaires for the Community College Student Information System (CCSIS) and the Trade/Vocational Enrolment Survey (TVOC).

Although PSIS was originally designed to provide both college and university data, only recent university data is available. The latest reliable college data goes back to 1999–2000. Longitudinal data for each post-secondary student in Canada could also be made available if the use of PSIS was to be maximized. Such a feature would provide more information on:

- pathways taken by students as they progress through the education system; and
- student persistence, program change and time to completion.

B. NATIONAL GRADUATE SURVEY, NGS, OCCASIONAL

The National Graduate Survey (NGS) measures the short to medium-term labour-market outcomes of graduates from Canadian public university, community college, and trade-vocational programs.

This survey was designed to determine such factors as:

- The extent to which graduates of post-secondary programs had been successful in obtaining employment since graduation;
- The relationship between the graduates' programs of study and the employment subsequently obtained;
- The graduates' job and career satisfaction;
- The rates of under-employment and unemployment;
- The type of employment obtained related to career expectations and qualification requirements; and
- The influence of post-secondary education on occupational achievement.

Each graduating class is interviewed twice: two years after graduation (National Graduates Survey) and five years after graduation (Follow-up of Graduates–FOG).

The survey target population are graduates from Canadian public post-secondary education institutions (universities, colleges, trade schools) who graduated or completed the requirements for degrees, diplomas or certificates during the reference calendar year.

Those excluded are: graduates from private post-secondary education institutions; completers of continuing-education programs (unless these led to a degree, diploma or certificate); part-time trade course completers; persons who completed vocational programs lasting less than three months; persons who completed vocational programs other than in the skilled trades (e.g., basic training and skill development); completers of provincial apprenticeship programs and those living outside of Canada or the United States at the time of the survey.

The survey involves a longitudinal design with graduates being interviewed at two different times: at two and five years after graduating from post-secondary institutions in Canada. The sample design has been developed using a “funnel-shaped” approach, where only graduates that respond to the initial interview are traced for the follow-up interview.

There are three variables used for stratification: geographical location of the institution, level of certification, and field of study.

There are 13 geographical locations: the 10 provinces and the three Northern Territories.

There are five levels of certification: trade/vocational programs, college programs, bachelor's degree, master's degree, and doctorate. As for the stratification level for the fields of study, it depends on the levels of certification. There are eight categories of field of study for the trade/vocational level and nine categories each for the college level and the three university level degrees (i.e., bachelor's, master's and doctorate) combined. As with previous iterations of the National Graduates Survey (NGS), the field of study was obtained by grouping the Community College Student Information System (CCSIS) and the University Student Information System (USIS).

For Follow-up of Graduates, it was determined that due to conceptual and sample requirement issues, it would be beneficial for the aims of the project as a whole to not follow-up with the trade/vocational graduates who responded to the NGS. Moreover, as part of the survey, the respondent was asked to confirm the certification level. Therefore, the FOG2000 sample is comprised of all NGS2000 respondents whose reported variable indicated that they earned either a college diploma or certificate, a Bachelor's degree, a Master's degree or a Doctorate in 2000.

Survey challenges

Data collection for this reference period: 2005-04-27 – 2005-07-24: ***NGS needs to be extended to cover a 10-year period. The frequency of the survey—every five years—diminishes its value when the PSE system in a period of rapid change.***

Responding to this survey is voluntary. Data are collected directly from survey respondents.

Computer-assisted telephone interviews were conducted with graduates living in Canada or in the United States: ***Financial and human resources issues constraints impact negatively on the survey coverage.***

Also, some institutions do not have the adequate resources to properly use the technology tools to collect the data. In a number of instances, some institutions request the assistance of Statistics Canada to make sure that the data that they are collecting is accurate. At the same time, Statistics Canada needs financial and human resources to cross-check the accuracy and the usefulness of the data submitted by institutions.

C. SURVEY OF EARNED DOCTORATES, SED, ANNUAL

This survey is designed to determine such factors as:

- Labour-market and mobility plans after graduation;
- How graduates funded their doctoral studies and how much, if any;
- Debt they accumulated during their studies; and
- The time required to complete a doctoral degree.

In addition, information on educational history and socio-economic background is collected.

The Survey of Earned Doctorates (SED) is an annual census of doctorate recipients in Canada that was conducted for the first time on a national basis during the 2003–2004 academic year. The basic purpose of this survey is to gather data about all doctoral graduates in Canada to inform government, associations, universities and other stakeholders on the characteristics and plans of these highly qualified graduates as they leave their doctoral programs.

These data are important in improving graduate education by providing governmental and private agencies with the information necessary to make program and policy decisions. Data about an institution's own doctorate recipients are also provided to, and used by, research offices of institutions who participate in the survey.

The survey's key data objectives are:

- To evaluate the impact of the various sources of institutional funding;
- To gather information on the retention of doctoral students in Canada;
- To gain a better understanding of post-graduate education financing and debt level;
- To allow labour-market planners to assess the additions to the domestic stock of highly qualified human resources in various fields; and
- To allow an examination of the path to receipt of doctoral degrees and the impact of foreign students.

The data from the SED can be used by universities and governments to make policy decisions that affect graduate education throughout Canada, by federal agencies to inform parliament and to make decisions about financial commitments that affect graduate education throughout Canada; and, in the evaluation of graduate education programs, strategic planning at the provincial level, labour force projections, and affirmative action plans at all levels.

The target population is doctoral graduates from Canadian post-secondary education institutions who have obtained their degree during the reference period. ***The survey population excludes institutions that did not participate in the survey during the reference period.***

The target population is identified from the list of Canadian post-secondary institutions granting doctoral degrees. This list is compiled and kept up-to-date by the Centre for Education Statistics of Statistics Canada. Every listed institution was invited to participate in this survey. Institutions with no doctoral graduates for the survey reference year were excluded from the target population.

Survey challenges

Responding to this survey is voluntary. Data are collected directly from survey respondents.

All doctoral graduates from participating institutions are invited to fill in a paper SED questionnaire, which is distributed by their institutions. The graduates can return the completed questionnaire directly to Statistics Canada or to their institutions. Institutions mail back the completed questionnaires to Statistics Canada. Follow-up calls with non-respondents are made by Statistics Canada.

D. SURVEY OF INCOME AND LABOUR DYNAMICS, SLID, ANNUAL

The survey's main objective is the understanding of the economic well-being of Canadians: what economic shifts do individuals and families live through, and how does it vary with changes in their paid work, family make-up, receipt of government transfers or other factors? The survey's longitudinal dimension makes it possible to see such concurrent and often related events. The survey has an additional dimension: the changes experienced by individuals over time.

SLID is the first Canadian household survey to provide national data on the fluctuations in income that a typical family or individual experience over time which gives greater insight on the nature and extent of poverty in Canada. Added to the longitudinal aspect are the "traditional" cross-sectional data: the primary Canadian source for income data and providing additional content to data collected by the Labour Force Survey (LFS).

Particularly in SLID, the focus extends from static measures (cross-sectional) to the whole range of transitions, durations, and repeat occurrences (longitudinal) of people's financial and work situations. Since their

family situation, education, and demographic background may play a role, the survey has extensive information on these topics as well.

The survey target population are all individuals in Canada, excluding residents of the Yukon, the Northwest Territories and Nunavut, residents of institutions and persons living on Indian reserves. Overall, these exclusions amount to less than 3 percent of the population.

This is a sample survey with a cross-sectional design and a longitudinal follow-up. The samples for SLID are selected from the monthly Labour Force Survey (LFS); and thus, share the latter's sample design.

The LFS sample is drawn from an area frame and is based on a stratified, multi-stage design that uses probability sampling. The total sample is composed of six independent samples, called rotation groups, because each month one sixth of the sample (or one rotation group) is replaced.

The SLID sample is composed of two panels. Each panel consists of two LFS rotation groups and includes roughly 15,000 households. A panel is surveyed for a period of six consecutive years. A new panel is introduced every three years, so two panels always overlap.

Survey challenges

Responding to this survey is voluntary. Data are collected directly from survey respondents and extracted from administrative files.

For each sampled household in SLID, interviews are conducted over a six-year period. Every year in January, interviewers collect information regarding respondents' labour-market experiences during the previous calendar year. Information on educational activity and family relationships is also collected at that time. The demographic characteristics of family and household members represent a snapshot of the population as of the end of each calendar year.

To reduce response burden, respondents can give Statistics Canada permission to use their T1 tax information for the purposes of SLID. Those who do so are only contacted for the labour interviews. Over 80% of SLID's respondents give their consent to use their administrative records.

E. YOUTH IN TRANSITION SURVEY, YITS, BIENNIAL

The Youth in Transition Survey (YITS) is a longitudinal survey designed to examine the patterns of, and influences on, major transitions in young people's lives, particularly with respect to education, training and work. The survey is undertaken jointly by Statistics Canada and Human Resources and Skills Development Canada.

Content includes measurement of major transitions in young people's lives including virtually all formal educational experiences and most market experiences, achievement, aspirations and expectations, and employment experiences. The implementation plan encompasses a longitudinal survey of each of two cohorts, ages 15 and 18 to 20, to be surveyed every two years.

The results from the Youth in Transition Survey will have many uses. Human Resources and Social Development Canada will use them to aid policy and program development. Other users of the results include educators, social and policy analysts, and advocacy groups. The information will show how young adults are making their critical transitions into their adult years. Information from the survey can be used in developing programs to deal with both short-term and long-term problems or barriers that young adults may face in their pursuit of higher education or in gaining work experience. Information from the survey will help to evaluate the effectiveness of existing programs and practices, to determine the most appropriate age at which to introduce programs, and to better target programs to those most in need.

Young adults themselves will be able to see the impact of decisions relating to education or work experiences. They will be able to see how their own experiences compare to those of other young adults.

The Program for International Student Assessment PISA/YITS is one project. It is an international assessment of the skills/knowledge of 15 year-olds, which aims to assess whether students approaching the end of compulsory education have acquired the knowledge and skills that are essential for full participation in society.

The 15 year-old respondents to the Reading Cohort (conducted in 2000) participated in both PISA and YITS. Since in 2002, they have been followed up longitudinally by YITS. The 15 year-old respondents to the Mathematics Cohort (conducted in 2003) participated in both PISA and YITS. They will not be followed up longitudinally.

The survey population for the 18 to 20 year-old cohort includes persons born in the years 1979 to 1981. Geographically, the target population excludes the Northern Territories, Indian reserves, Canadian Forces bases and some remote areas.

The survey population for the Reading Cohort (15 year-olds) comprises persons who were born in 1984 and were attending any form of schooling in the ten provinces of Canada. Schools on Indian reserves were excluded, as were various types of schools for which it would be infeasible to administer the survey, such as home schooling and special needs schools. These exclusions represent less than 4% of 15-year-olds in Canada.

As comparability with the previous cycle survey results was an important objective of Cycle 3–YITS, only minimal modifications were made to the wording of the questions.

YITS is a sample survey with a longitudinal design:

18 to 20 year-old Cohort

Factors such as the high mobility rate of the 18 to 20 year-old cohort and its relatively low incidence at the household level led to a stratified multi-stage sample design based on the use of the Labour Force Survey sample, drawing from currently active and rotate-out households. Within each household, one person in the target population was pre-selected for YITS. The initial sample size was 29,000 persons.

Reading Cohort (15 year-olds)

The sample design for the Reading Cohort (15 year-olds) entails two-stage probability sampling, with a stratified sample of 1,200 schools selected at the first stage and a sample of eligible students selected within each sampled school. The initial student sample size for the reading cohort which was conducted in 2000 was 38,000 persons.

Among the Reading Cohort (15 year-olds) and the 18 to 20 year-old cohort, only those who responded in Cycle 2 were re-contacted in Cycle 3. The resulting sample size was 26,854 for the Reading Cohort (15 year-olds) and 18,743 for the 18 to 20 year-old cohort.

Survey challenges

Data collection for this reference period: 2004-02-15 – 2004-06-15.

Responding to this survey is voluntary. Data are collected directly from survey respondents.

Collection for Cycle 3 took place from mid-February to mid-June 2004 using computer-assisted telephone interview (CATI). The response rate for the 18 to 20 year-old cohort was 78.9%. The response rate for the Reading Cohort (15 year-olds) was 84.3%. The combined response rate for both cohorts in Cycle 3 was 82.1%.

F. UNIVERSITY AND COLLEGE ACADEMIC STAFF SURVEY, UCASS, ANNUAL

This survey is a census with a cross-sectional design and is conducted to obtain national comparable data concerning the socio-economic characteristics of university full-time staff.

The target population of this survey is full-time teaching staff in degree-granting institutions that have a teaching assignment and are under contract for twelve months or more. Administrative and support staff are excluded, as are staff solely engaged in research. Teaching and research assistants are also excluded.

Survey challenges

Responding to this survey is voluntary. Data are collected directly from survey respondents.

The survey is designed to collect information on the characteristics of full-time teachers in degree-granting institutions. Each year Statistics Canada sends out a "Systems Manual" which lists all the data elements which are to be reported by all the institutions. Every institution is asked to submit the data to Statistics Canada by choosing one of the following options:

- a) individual teacher records on hard copy;
- b) individual teacher records on magnetic tape.

There are 83.5% of records which are reported on tape and the balance reported on pre-printed documents.

Following the suspension of the Annual Community College Educational Staff Survey (ACCESS), in 2004, Statistics Canada suspended data collection on part-time university faculty and all college faculty; and has continued to collect and issue data only on full-time university faculty.

G. TUITION, LIVING AND ACCOMMODATION COSTS SURVEY, TLAC, ANNUAL

The survey is a census with a cross-sectional design. Its purpose is to collect tuition fees and living accommodation costs concerning all universities and degree-granting colleges across the country. The Survey was developed to provide student financial information (tuition fees and living accommodation costs) on all universities and degree-granting colleges in Canada.

This information:

- gives associations and governments a better understanding of the student financial position for that level of education;
- helps in the development of policies in this sector;
- helps measure the impact of increased tuition fees; and
- helps measure the impact of federal/provincial support.

The target population is all degree-granting institutions (universities and colleges) in Canada.

Survey challenges

Responding to this survey is voluntary. Data are collected directly from survey respondents.

All universities and degree-granting colleges report via questionnaire.

H. SURVEY OF INTELLECTUAL PROPERTY COMMERCIALIZATION IN THE HIGHER EDUCATION SECTOR, ANNUAL

The survey is a census with a cross-sectional design. Its objective is to assure the availability of pertinent information to monitor science and technology related activities and to support the development of science and technology policy.

The topic studied is intellectual property management at universities and research hospitals. The data are used to determine how to maximize the benefits resulting from public sector research. Data users include the federal and provincial governments and university administrators and researchers.

Science and Technology (S&T) and the information society are changing the way we live, learn and work. The concepts are closely intertwined: science generates new understanding of the way the world works, technology applies it to develop innovative products and services and the information society is one of the results of the innovations. The Science, Innovation, and Electronic Information Division (SIEID) measures and explains the social and economic impacts of these changes. The purpose of this Program is to develop useful indicators of S&T activity in Canada based on a framework that ties them together in a coherent picture.

The target population is members of the Association of Universities and Colleges of Canada (AUCC), as well as the university-affiliated research hospitals. The latter includes some members of the Association of Canadian Teaching Hospitals (ACTH) and some other hospitals reporting R&D activity on the Annual Hospital Survey.

Instrument design

In early 1997, Statistics Canada commissioned a report by The Impact Group, which was entitled "Commercialization of Intellectual Property in the Higher Education Sector: A Feasibility Study." It recommended a set of 50 indicators to measure the components of the commercialization process.

The Association of Universities and Colleges of Canada (AUCC) recommended additional indicators and facilitated consultations with university representatives.

The 2003 survey was redesigned by a working group consisting of the AUCC, the Association of University Technology Managers (AUTM), Industry Canada and Statistics Canada.

For each survey cycle, respondent comments and observed difficulties in completing particular questions are routinely gathered and used to make (mostly minor) changes to the next questionnaire and the survey handbook.

Survey challenges

Responding to this survey is voluntary. Data are collected directly from survey respondents.

The survey is mailed to the Vice-President of Research of the university or the CEO of the hospital. The accompanying letter mentions the collaboration of the AUCC in the development of the survey. *If the institution has a technology transfer office*, the questionnaire will typically be sent there for completion. However, for large universities, the information must usually be gathered from several different offices, such as the Office of Research Contracts, the Office of the VP Research and the technology transfer office.

Follow-up for individual institutions is done by telephone. General e-mail reminders are also sent out by Statistics Canada and the AUCC. For the 2004 survey, collection spanned nine months. The collection of this survey takes longer than normal because it is still relatively new, participation is voluntary and some of the information must be compiled manually.

I. FINANCIAL INFORMATION OF UNIVERSITIES AND COLLEGES SURVEY, (FIUC), ANNUAL

This survey is a census with a cross-sectional design. Its purpose is to collect financial information (income and expenditures) on all universities and degree-granting colleges across the country.

This information:

- gives associations and governments a better understanding of the financial position of universities and degree-granting colleges;
- helps in the development of policies in this sector;
- helps measure impact of increased tuition fees; and
- helps measure impact of federal/provincial support.

The target population is all degree-granting institutions (universities and colleges) in Canada.

Survey challenges

Responding to this survey is voluntary. Data are collected directly from survey respondents and extracted from administrative files. All universities, except for Ontario CAUBO universities, report via questionnaire. The Financial Information of Universities and Colleges (FIUC) questionnaire is both paper and electronic (Excel), in both CAUBO (Canadian Association of University Business Officers) and non-CAUBO formats. Most respondents reply via electronic questionnaire on diskette.

Ontario CAUBO universities report to their own collection authorities (Council of Finance Officers–Universities of Ontario (COFO)). This information is sent to Statistics Canada (STC) as one large flat file. A mapping and integration process is then done to convert the COFO data into the CAUBO format database.

J. LABOUR FORCE SURVEY, LFS, MONTHLY

The Labour Force Survey provides estimates of employment and unemployment, which are among the most timely and important measures of performance of the Canadian economy.

With the release of the survey results only 13 days after the completion of data collection, the LFS estimates are the first of the major monthly economic data series to be released.

The survey was developed following the Second World War to satisfy a need for reliable and timely data on the labour market. Information was urgently required on the massive labour-market changes involved in the transition from a war to a peace-time economy. The main objective of the LFS is to divide the working-age population into three mutually exclusive classifications—employed, unemployed, and not in the labour force—and to provide descriptive and explanatory data on each of these.

LFS data are used to produce the well-known unemployment rate as well as other standard labour-market indicators such as the employment rate and the participation rate.

The LFS also provides employment estimates by:

- industry;
- occupation;
- public and private sector; and
- hours worked and much more, all cross-classifiable by a variety of demographic characteristics. Estimates are produced for Canada, the provinces, and a large number of sub-provincial regions.

For employees, wage rates, union status, job permanency and workplace size are also produced.

These data are used by different levels of government for evaluation and planning of employment programs in Canada. Regional unemployment rates are used by Human Resources and Social Development Canada to determine eligibility, level and duration of insurance benefits for persons living within a particular employment insurance region. The data are also used by labour-market analysts, economists, consultants, planners, forecasters and academics in both the private and public sector.

es and inmates of institutions. These groups together represent an exclusion of less than 2% of the population aged 15 and over.

The current LFS questionnaire was introduced in 1997. At that time, significant changes were made to the questionnaire in order to address existing data gaps, improve data quality and make more use of the power of Computer Assisted Interviewing (CAI).

The changes incorporated included the addition of many new questions. For example, questions were added to collect information about wage rates, union status, job permanency and workplace size for the main job of currently employed employees. Other additions included new questions to collect information about hirings and separations, and expanded response category lists that split existing codes into more detailed categories.

The questionnaire was also extensively restructured in terms of the order of the questions and the flows between questions. For example, the job description questions about the current (or most recent) job were moved near the beginning of the questionnaire so that this information (especially the class of worker) could be used to control some of the question flow, question wording and applicable response categories in later questions. As well, some questions known to be problematic were modified through rewording or the inclusion of additional questions (e.g., the hours of work question series and the identification of persons on temporary layoff).

Since the existing questionnaire had been designed as a paper questionnaire, the questionnaire redesign represented an opportunity to make extensive use of the power of CAI. This included the incorporation of question wording that depended upon answers to earlier questions, more complex question flows and an extensive set of on-line edits checking for logical inconsistencies.

The implementation of the new questionnaire followed an extensive process of user consultations, questionnaire development and questionnaire testing. The questionnaire was phased in over a five-month period between September 1996 and January 1997.

Sampling

This is a sample survey with a cross-sectional design. The LFS uses a probability sample that is based on a stratified multi-stage design. Each province is divided into large geographic stratum. The first stage of sampling consists of selecting smaller geographic areas, called clusters, from within each stratum. The second stage of sampling consists of selecting dwellings from within each selected cluster.

The LFS uses a rotating panel sample design so that selected dwellings remain in the LFS sample for six consecutive months. Each month about 1/6th of the LFS sampled dwellings are in their first month of the survey, 1/6th are in their second month of the survey, and so on. One feature of the LFS sample design is that each of the six rotation groups can be used as a representative sample by itself.

Within selected dwellings, basic demographic information is collected for all household members. Labour force information is collected for all civilian household members who are aged 15 and over.

Since July 1995, the monthly LFS sample size has been approximately 54,000 households, resulting in the collection of labour-market information for approximately 100,000 individuals. It should be noted that the LFS sample size is subject to change from time to time in order to meet data quality or budget requirements.

The LFS sample is allocated to provinces and regions within provinces to meet the need for reliable estimates at various geographic levels. These include national, provincial, census metropolitan areas (large cities), economic regions and employment insurance regions.

Data sources

Responding to this survey is mandatory. Data are collected directly from survey respondents.

The LFS is conducted using Computer Assisted Interviewing (CAI) by a staff of trained interviewers located across the country. The first interview with a household (also known as the birth interview) is usually conducted in person by a field interviewer using a laptop computer.

This method of interviewing is known as Computer Assisted Personal Interviewing (CAPI). Interviews in subsequent months are conducted by telephone by regional office interviewers using Computer Assisted Telephone Interviewing (CATI) if the respondent grants permission to be contacted by telephone for subsequent interviews.

All of the data that are collected using laptop computers are transmitted to the appropriate regional office or directly to head office via modem, with the data encrypted in order to ensure that confidentiality is protected. All of the data received and collected at the regional offices are transmitted over a secure line to head office.

Proxy interviews are allowed for the LFS, which means that information can be collected for the entire household from any responsible household member. Such proxy reporting accounts for approximately 65% of information collected.

To save on collection costs and respondent burden in subsequent interviews, some information collected in the previous interview is not re-asked, but rather is pre-filled in the computer questionnaire and then verified with the respondent. This includes the list of household members, basic demographics, and some job description information for persons eligible for the labour force questions. As well, to minimize respondent burden for the elderly, persons aged 70 and over are not asked the labour force questions in subsequent interviews, but rather their labour force information is carried forward from their first interview.

ENDNOTES

- 1 Federal Budget Plan 2007 *Aspire to a Stronger, Safer, Better Canada*. Tabled in the House of Commons March 19, 2007 by the Honourable James M. Flaherty, Minister of Finance.
- 2 Larry Orton (2006). *A new understanding of post-secondary education in Canada: A discussion*. Statistics Canada, Catalogue no. 81-595-MIE No. 011 (Ottawa: 2006).
- 3 Definition from Lisa Hudson and Dan Andersson cited in *Measuring the social outcomes of learning: OECD Network B's Role and Perspective*. Proceedings of the OECD Copenhagen Symposium, 2006.
- 4 This approach requires the definition of meaningful sub-sectors of the PSE sector (see earlier discussion of the PSE sector) and recognizes the fact that there is great diversity in institutional characteristics across the PSE sector. A benchmark—or system average—can then be defined for a specific PSE sub-sector where there are families of institutions with similar characteristics and aspirations. This benchmark can then be a meaningful comparative indicator providing what is being considered is common to members of the family.
- 5 Available at <http://www.statcan.ca/english/rdc/productintro.htm>—Aboriginal Peoples Survey (APS), http://dissemination.statcan.ca/english/rdc/pdf/aps_rounding.pdf Canadian Community Health Survey (CCHS), Ethnic Diversity Survey (EDS), General Social Survey (GSS), Longitudinal Survey of Immigrants to Canada (LSIC), National Graduates Survey (NGS), National Longitudinal Survey of Children and Youth (NLSCY), National Population Health Survey (NPHS), Participation and Activity Limitation Survey (PALS), Survey of Labour and Income Dynamics (SLID), Workplace and Employee Survey (WES), Youth in Transition Survey (YITS).
- 6 Manual for the Development of a System of Criminal Justice Statistics. UN 2003.
- 7 Service learning is a teaching model that offers a way to engage the academy and students with communities through structured curriculum-based experiential learning.
- 8 Longitudinal Survey of Immigrants to Canada. Progress and Challenges of New Immigrants in the Workforce. Statistics Canada, Social and Aboriginal Statistics Division. Catalogue No. 89-615-XIE. (Ottawa: 2005).
- 9 As an example—British Columbia Co-operative Education Statistical Database provides for and encourages the adoption of consistent program guidelines and standards for quality co-operative education in BC—and collects and disseminates standardized co-op statistical data related to co-op education programs from member institutions.
- 10 Craig Riddell, *The Impact of Education on Economic and Social Outcomes: An Overview of Recent Advances in Economics*. Canadian Policy Research Network (Ottawa, 2006).
- 11 Polanyi, M. and Karen M. Andres, *Deliberative Democracy: An Emerging Determinant of Health and Well-Being?* Canadian Social Welfare Policy Conference (Ottawa: 2003).
- 12 Issues around quality of research and research training have been primarily integrated into Goal 2 and are not the focus of this section. Similarly issues around the cost of PSE provision are dealt with under Goal 8—affordability.
- 13 Barriers to participation and persistence are typically characterized as 1) academic, 2) financial, 3) awareness, interest and motivation. This section does not consider directly the financial barriers which are covered under Goal 8 “Affordability”, but recognizes the interplay of financial and non-financial barriers.
- 14 Marc Frenette. *Why Are Youth from Lower-income Families Less Likely to Attend University? Evidence from Academic Abilities, Parental Influences, and Financial Constraints*. Analytical Studies Branch Research Paper Series, Statistics Canada. Catalogue no. 11F0019MIE—No. 295 (Ottawa: February 2007).
- 15 Mendelson, Michael. *Aboriginal Peoples and Post-secondary Education*. Caledon Institute of Social Policy (Ottawa: 2006).
- 16 Auriol, Laudeline. *Labour market characteristics and international mobility of doctoral holders: results for seven countries*. OECD, STI Working Paper. (Paris: February 2007).
- 17 It is notable that the largest number of statistics in default for the OECD *Education at a Glance* publication relate to the financial and human resources invested in education.
- 18 See Council of Ontario Universities Resource Book 2007 for examples of data available in some provinces.

BIBLIOGRAPHY

- Auriol, L. *Labour market characteristics and international mobility of doctoral holders: results for seven countries*. OECD, STI Working Paper. (Paris: February 2007).
- Canadian Council on Learning. *Canadian Post-secondary Education: A Positive Record – An Uncertain Future* (Ottawa: 2006).
- Council of Ontario Universities. *Ontario universities—2007 Resource document* (Toronto: March 2007).
- Craig Riddell. *The Impact of Education on Economic and Social Outcomes: An Overview of Recent Advances in Economics*. Canadian Policy Research Network (Ottawa, 2006).
- Department of Finance Canada. *Federal Budget 2007: Aspire to a Stronger, Safer, Better Canada* (Ottawa: March 19, 2007).
- Hudson, L. and Andersson, D. "Measuring the social outcomes of learning: OECD Network B's Role and Perspective" *Proceedings of the Copenhagen symposium: Measuring the effects of education on health and civic engagement* (Copenhagen: 2006).
- Longitudinal Survey of Immigrants to Canada. *Progress and Challenges of New Immigrants in the Workforce*. Statistics Canada, Social and Aboriginal Statistics Division. (Ottawa: 2005). Catalogue N° 89-615-XIE
- Frenette, Marc. "Why Are Youth from Lower-income Families Less Likely to Attend University?" *Evidence from Academic Abilities, Parental Influences, and Financial Constraints*. Analytical Studies Branch Research Paper Series, Statistics Canada. (Ottawa: February 2007). Catalogue no. 11F0019MIE—N° 295
- Mendelson, Michael. *Aboriginal Peoples and Post-secondary Education*. Caledon Institute of Social Policy (Ottawa: 2006).
- Orton, L. *A new understanding of post-secondary education in Canada: A discussion*. (Ottawa: 2006). Statistics Canada, Catalogue no. 81-595-MIE N° 011
- Plant, G. *Campus2020. Thinking ahead: the report*. The Campus 2020 Plan for British Columbia's Post-Secondary Education System (British Columbia: April 2007).
- Polanyi, M. and Karen M. Andres, *Deliberative Democracy: An Emerging Determinant of Health and Well-Being?* Canadian Social Welfare Policy Conference (Ottawa: 2003).
- Rae, B. *Ontario—A Leader in Learning*. Report and Recommendations. (Toronto: February 2005.)
- United Nations. *Manual for the Development of a System of Criminal Justice Statistics*. Department of Economic and Social Affairs Statistics Division, (New York: 2003). Studies in methods, Series F N° 89

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