The background of the cover features a teal and white color scheme. It includes several faint, overlapping elements: a line graph with a curve labeled $f(x)$ and a y-axis ranging from 0 to 80; a bar chart with three bars labeled 31.8, 39.8, and 37.1; a scatter plot with points labeled 0.1, 0.2, and 0.3; and silhouettes of human figures. Mathematical symbols like α , θ , and t_{u2} are also visible.

The Adult Learning and Returns to Training Project

Final Report

Karen Myers | Arthur Sweetman

April 2014

The Social Research and Demonstration

Corporation (SRDC) is a non-profit research organization, created specifically to develop, field test, and rigorously evaluate new programs. SRDC's two-part mission is to help policy-makers and practitioners identify policies and programs that improve the well-being of all Canadians, with a special concern for the effects on the disadvantaged, and to raise the standards of evidence that are used in assessing these policies.

Since its establishment in December 1991, SRDC has completed over 200 projects and studies for various federal and provincial departments, municipalities, as well as other public and non-profit organizations. SRDC has offices located in Ottawa, Toronto, and Vancouver.

For information on SRDC publications, contact

Social Research and Demonstration Corporation
55 Murray Street, Suite 400
Ottawa, Ontario K1N 5M3
613-237-4311 | 1-866-896-7732
info@srdc.org | www.srdc.org

Vancouver Office
128 West Pender Street, Suite 301
Vancouver, British Columbia V6B 1R8
604-601-4070 | 604-601-4080

Toronto Office
481 University Avenue, Suite 705
Toronto, Ontario M5G 2E9
416-593-0445

Published in 2014 by the Social Research and
Demonstration Corporation

Table of contents

Introduction	1
Report purpose and project objectives	1
Project phases	1
Report structure	2
1. Analytical Framework phase	3
Approach	3
Components	3
2. Empirical Evidence phase	9
Approach	9
Research program	10
3. Discussion and conclusions	12
Robustness of the Analytical Framework	12
What did we learn about adult learning?	14
Agenda for future research	19
Future data needs	21
Conclusions	23

Introduction

Report purpose and project objectives

This is the final report for the *Adult Learning and Returns to Training Project*. The purpose of this report is to provide a high-level overview of each of the project phases and to provide a discussion of the key contributions of this project including a discussion of data needs and preferred research designs to inform future research agendas. The *Adult Learning and Returns to Training Project* is a three-year multi-disciplinary and collaborative effort to further the knowledge base of conceptual, analytical and methodological issues concerning the scope and measurement of adult learning activities and their associated financial and non-financial returns to individuals, firms and society at large. The research project has three broad objectives:

1. To develop and test a comprehensive theoretical, analytical, and methodological framework for understanding and measuring the wider outcomes of adult learning;
2. To test this framework by conducting empirical research to address policy relevant research questions such as who should invest in adult learning activities, what is the relative role of governments, firms, and individuals in fostering these investments, and what are best practices for adults with low education and/or low skills;
3. To identify data needs and preferred research designs to inform future research agendas.

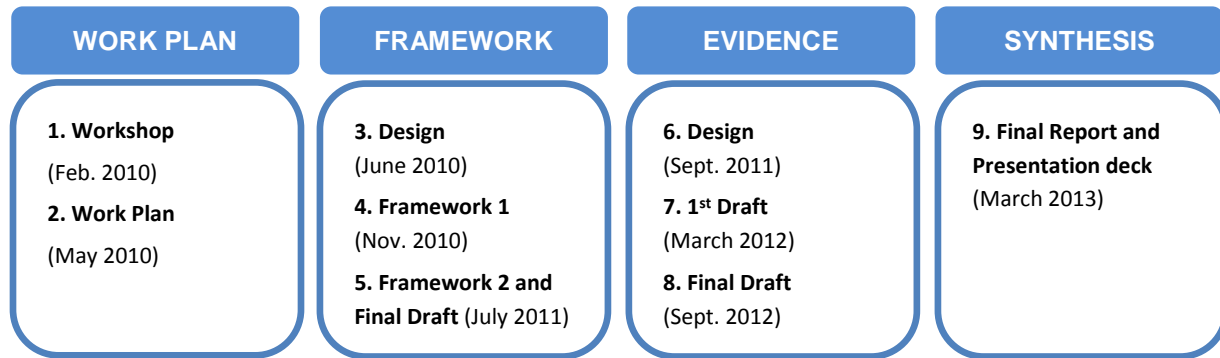
Project phases

The project was divided into four major phases (Figure 1). The first phase was the development of the Work Plan. This was a collaborative and iterative process. The research team co-leaders took several steps to engage the core research team, HRSDC officials and other experts in the field to obtain input to the overall research process and to ensure alignment with HRSDC strategic policy research goals. The project was officially launched in February 2010 with a departmental workshop. The Work Plan was officially approved in May of the same year.

The second phase was the development of the Analytical Framework. Work on the analytical framework began in June 2010 and was finalized the next year in July 2011. The output for this phase includes a typology of adult learning, a framework for conceptualizing outcomes, a practical guide to estimating returns, a literature review and a dictionary of key terms.

The third phase was the Empirical Evidence phase. The purpose of this phase was both to generate new evidence on outcomes of various types of adult learning and to test the usefulness and robustness of the analytical framework itself. The final phase is the synthesis phase. This report is the major output of this phase. The purpose of this phase is to provide a comprehensive and integrated account of integrates the work that was completed in the first three tasks and to provide potential directions for future research in this area. .

Figure 1 Adult learning and returns to training project phases



Report structure

The report is organized into the following three sections:

- Section 1 provides an overview of our approach to the Analytical Framework phase and provides a high level summary of the major components that resulted from this phase;
- Section 2 summarizes our approach to the Empirical Evidence phase. It also provides a high-level overview of the research papers developed for this phase;
- Section 3 presents an analysis of the robustness of the Analytical Framework based on the results of the Empirical Evidence phase. We also summarize our contribution to state of knowledge on the returns to adult learning as a result of both of these phases;
- Finally, we conclude with a discussion of data needs and provide the potential building blocks for an agenda for future research for estimating returns to adult learning.

1. Analytical Framework phase

Approach

The Analytical Framework phase was carried out between June of 2010 and July of 2011. The purpose of this phase was to develop a comprehensive theoretical, analytical, and methodological framework for understanding and measuring the wider outcomes of adult learning. The purpose of the framework is to specify and organize the various dimensions of adult learning and associated variables for the measurement and estimation of economic and social outcomes, impacts, and returns for individuals, firms, and society. The framework was intended to provide a consistent means for communication across HRSDC program and policy areas and provide a coherent framework to guide the empirical aspects of this project. The framework is intended to be a concise, stand alone, user-friendly synthesis of the following components: an adult learning typology, a conceptual framework that provides a conceptual map and set of definitions to lay the groundwork for specifying what should count in estimating returns to adult learning; a guide to estimating returns to adult learning activities; and a state of knowledge review; and a dictionary of terms related to adult learning, its outcomes, and its measurement.

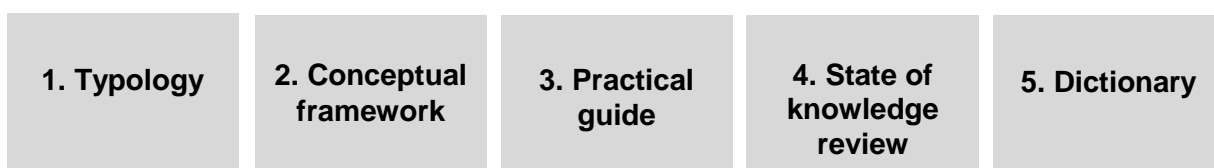
The framework was developed in four broad phases:

1. The first step was to refine the framework for linking adult learning activities to outcomes presented in the project proposal. A refined version of the framework acted as a “working” framework that guided the development of the Analytical Framework and supporting components.
2. The next step was to work with a team of authors to draft a series of technical papers. These papers informed the development of the Analytical Framework and are described as Supporting Components later in this section.
3. The third step was to validate the analytical framework. A roundtable was held in December of 2010 to obtain feedback from HRSDC and other selected experts. After the roundtable, HRSDC staff provided extensive feedback on each framework component.
4. The final step was to refine the framework based on the feedback we had received from the roundtables and from other discussions with selected staff at HRSDC.

Components

The Analytical Framework had five key components (see Figure 2). This section briefly describes the purpose of each component.

Figure 2 Components of the Analytical Framework



Typology

The Typology report presents a proposed typology for classifying adult learning activities. It proposes an inclusive definition of adult learning and a modular definition of an adult learner with core elements and additional criteria that can be applied depending on circumstances. It also proposes an approach to classifying adult learning activities, which is informed by how various types of adult learning are designed and delivered in practice. Finally, it identifies and describes adult learning activities in terms of a set of key dimensions such as provider, payer, purpose, duration, design and delivery. Figure 3 presents the definitions and classification scheme proposed in the Typology.

Conceptual framework

Once the typology of adult learning was established, the next step was to create a conceptual framework that is a high-level map for specifying a wide range of outcomes associated with various types of adult learning. The framework lays the foundation for specifying what should count in estimating returns to adult learning. As such, it considers a wide range of intermediate and final outcomes for individuals, firms and society. It also considers a complex set of individual and structural factors that may enable and/or hinder outcomes (see Figure 4).

Practical Guide

Once a comprehensive set of potential outcomes was specified the next step was to create a high level guide that conceptualized strategies for measurement of these outcomes. The Practical Guide presents an approach for estimating returns based on a cost benefit framework. It also ranks a wide range of research designs using a hierarchy of evidence (see Figure 5).

State of knowledge review

Next we conducted a state of knowledge review for various types of adult learning according to our framework. For each type of learning, we summarized what is known about the extent to which this type of learning is associated with all of the outcomes specified in our conceptual framework (see Figure 6). The quality of evidence for each type of outcome was assessed according to the hierarchy of knowledge developed in the Practical Guide.

Dictionary

The final report, the Dictionary provides a list of key terms and definitions used throughout the other four documents.

Figures 3 to 6 on the following pages provide an illustration of the core aspects of each framework component. For readers who wish for more detail, full and summary reports are available for each of the five components.

Figure 3 Overview of the adult learning typology

Definition of adult learning

Adult learning is broadly defined as purposeful and directed learning undertaken by adults, either alone or in groups, to increase knowledge and skills, and/or change behaviours, values, or beliefs.

This definition includes formal, non-formal and informal learning but excludes incidental learning.

Non-intentional		Intentional	
Unstructured		Structured	
Incidental learning	Informal learning	Non-formal learning	Formal learning

Definition of adult learners

Core Definition:

All learners age 25 and older

Additional components:

Include – learners age 20 to 24 who are pursuing foundational learning

Include – learners age 20 to 24 who are in “adult social roles” such as heading a family or working full-time as a primary activity

Additional considerations depending on research, policy, program objective:

Exclude – learners over age of 65 if focus is on the working age adults

Exclude – learners pursuing advanced degrees if focus is on adults with lower skills

Exclude – learners who engage in learning primarily for non-labour market reasons

Five types of adult learning

Foundational	Higher Education	Workplace-related	Other Labour Market-related	Personal/Social
Instruction on the basic skills and learning strategies required for further learning or employment, typically below the Grade 12 level or IALS Level 3.	Education or training that is offered by a post-secondary education institution and leads to a post-secondary credential.	Learning related to the firm in which the learner is employed that is supported at least to some extent by the employer, but that is not Foundational or Higher Education.	Learning to improve labour market prospects, but is not related to the firm in which a learner is employed, and is not Foundational or Higher Education.	Learning directed to individuals in the context of their families and communities for the purpose of personal, social, cultural, civic, or spiritual growth or enrichment.

Figure 4 A high-level conceptual framework for differentiating the processes that lead to outcomes of adult learning

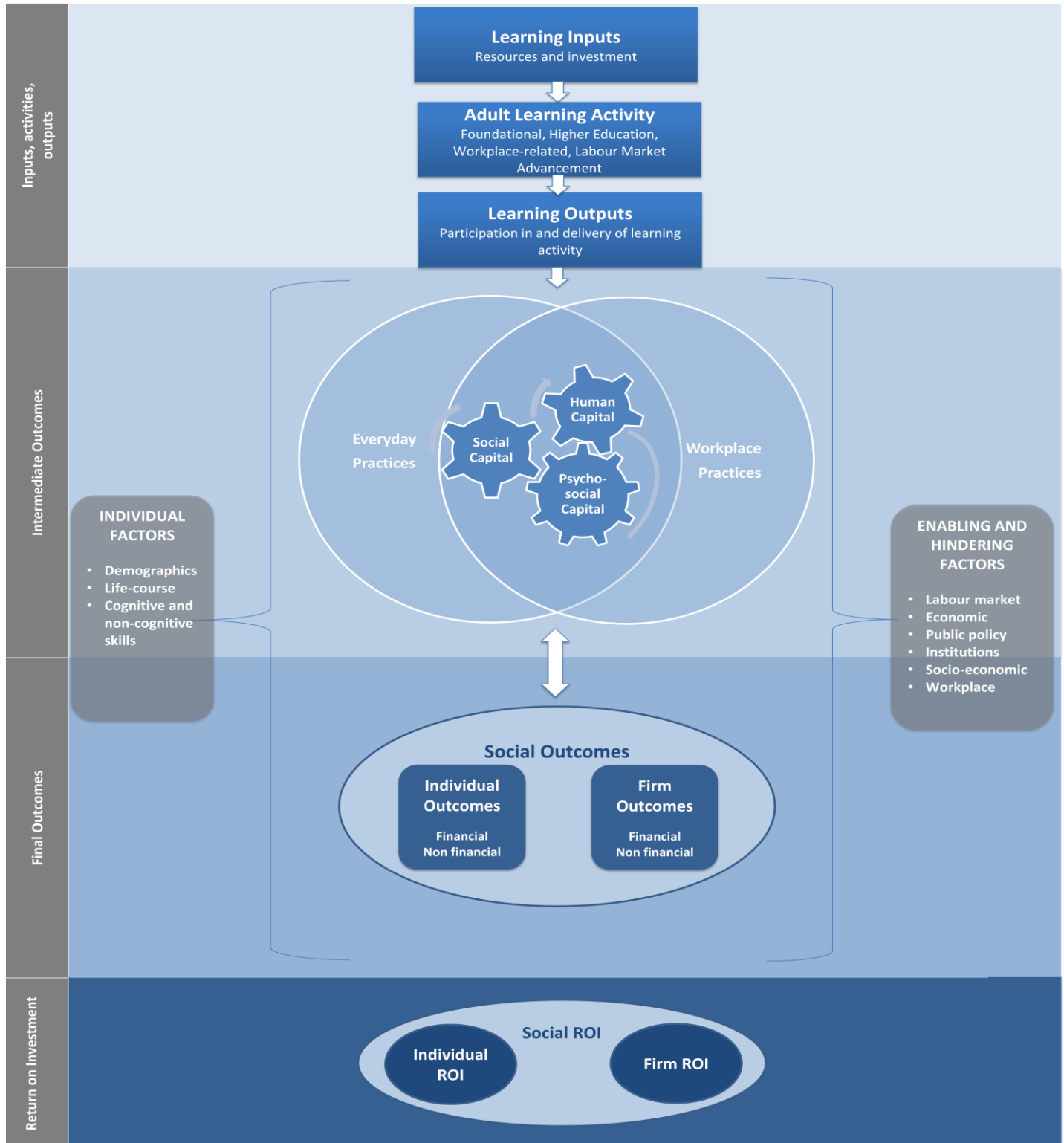


Figure 5 Hierarchy of evidence

	Type	Design features	Evidence quality
Upper Tier Individual studies with randomization /credible source of exogenous variation	Systematic reviews and meta-analysis	Use established approach to synthesize all quality research evidence (esp., "upper tier" studies) on a specific issue.	Strongest evidence but only as strong as underlying evidence.
	Randomized experiments	Well-designed with sufficient sample size.	Very strong evidence.
	Natural experiments	<ul style="list-style-type: none"> High quality source of exogenous variation generating comparison group that provides credible approach to estimating counterfactual. Well-designed pre-post measures of outcomes and well-measured and appropriate data with large sample. Employs techniques such as regression discontinuity, instrumental variables, difference-in-differences or propensity score matching. 	Very strong evidence if the source of exogenous variation is credible and if appropriate econometric/statistical technique(s) is (are) employed to extract the information from the data.
Middle Tier Limited or no source of exogenous variation, but with credible comparison group/counterfactual	Some control in the assignment of treatment	<ul style="list-style-type: none"> Limited source of exogenous variation or some control of selection process (e.g., program administrator, perhaps non-randomly, assigns treatment; different sites follow different procedures; or individuals select into limited range of options). Well-designed pre-post outcome measures; dynamic pre-treatment measures; well measured, appropriate data with large sample. Employs techniques such as difference-in-differences and/or propensity score matching, or an appropriate regression technique. 	Studies in this tier produce evidence that ranges from very <i>strong</i> and <i>strong</i> to <i>moderate</i> depending on specific design features. All other things being equal, studies with some control in assignment of treatment are generally ranked higher than studies without control.
	Correlational studies including studies relying on selection on observables and case studies with a comparison group	<ul style="list-style-type: none"> Reasonable approach to estimating counterfactual; well-designed pre-post measures of outcomes; large sample and rich set of covariates. Quality of the comparison group is critical. Employ techniques such as difference-in-differences; population correlation designs; propensity scoring matching, hierarchical linear modeling, structural equation modeling, and OLS regression. Longitudinal designs may use techniques like fixed effects. 	Studies without any exogenous variation but with a credible comparison group/counterfactual generally produce evidence that ranges from <i>very strong</i> and <i>strong</i> to <i>moderate</i> depending on specific design features.
Lower Tier Studies without measured comparison groups/counterfactuals	Studies without comparison group	Credible case selection, explicit causal logic model and analytical strategy, understanding of the process, quality outcome measures.	Evidence should be considered suggestive.
	Participant satisfaction	Collects feedback from participants on value of intervention. Better quality studies ask about "value added" or change in relevant outcomes following from treatment, rather than only eliciting measures or opinions regarding satisfaction, inputs, outputs, processes, or outcomes	Care needs to be taken to understand potential biases and interpret the findings accordingly
	Expert opinions	Respected organizations or individuals, explicit rationale for opinion.	
	Exploratory case studies	Less credible/explicit: case selection criteria, theory of change, analytical strategy or outcome measures. Does not have good quality (or any) outcome measures. May rely on measures of inputs or outputs.	Evidence should be considered suggestive.

Caveat emptor: Some studies claim a high quality source of exogenous variation or rich covariates for matching, but the reader must decide for herself whether these claims are credible. A study using an instrumental variable approach with a poor source of exogenous variation may be best discarded. Even the most sophisticated technique cannot extract information from data that is not there to start with.

Figure 6 Summary of state of knowledge on returns to adult learning

Component	Foundational learning	Higher education	Workplace learning
Inputs and outputs	<ul style="list-style-type: none"> No rigorous studies, but exploratory studies suggest design and delivery matter Promising area for further research No studies on outputs 	<ul style="list-style-type: none"> No rigorous studies, but exploratory studies suggest design and delivery not suited to adults Promising area for further research No studies on outputs 	<ul style="list-style-type: none"> No rigorous studies but inputs well understood in corporate HR & training literature No studies on outputs
Intermediate outcomes Human, social, psychosocial capital	<ul style="list-style-type: none"> A few studies with mixed evidence for human capital, some evidence for psychosocial capital and very weak evidence for social capital. Future research could explore if intermediate outcomes are associated with final outcomes 	<ul style="list-style-type: none"> No studies Further research could explore whether intermediate outcomes are mechanisms by which well-established final outcomes like earnings are achieved and thus explain part of variation in outcomes 	<ul style="list-style-type: none"> No rigorous studies
Individual final outcomes Financial and non-financial	<ul style="list-style-type: none"> A few rigorous studies report outcomes ranging from modest to no effect on wages Anecdotal evidence to suggest poor outcomes related to both small doses and poor design Further research could test this by comparing program models Several rigorous studies find non-financial benefits for high school in general but unclear if same benefits would apply to adults or other types of foundational learning 	<ul style="list-style-type: none"> Several rigorous studies report adult higher education increases earnings Further research could test how earnings premiums vary by sub-groups, individual factors credential/institution, and whether design is more responsive to adult needs Several rigorous studies find non-financial benefits for PSE in general but unclear if same benefits would apply to PSE earned later in life 	<ul style="list-style-type: none"> Numerous studies report training is associated with increased wages, but estimates vary dramatically. A few studies also report training is associated with non-financial outcomes like increased job satisfaction, but again estimates vary dramatically.
Social final outcomes Financial and non-financial	<ul style="list-style-type: none"> Studies find benefits for high school diploma in general but unclear if the same benefits would apply to adults or other types of foundational learning 	<ul style="list-style-type: none"> Studies find benefits for PSE in general but studies do not specify if effects apply to PSE obtained later in life 	
Firm final outcomes Financial and non-financial	<ul style="list-style-type: none"> Numerous case studies report a range of positive outcomes but cases are usually selected post hoc overstating benefits OLES is currently conducting a large scale demonstration project to investigate impact of workplace learning on a wide range of outcomes. 	<ul style="list-style-type: none"> We are not aware of any studies that differentiate firm outcomes based on whether employees participated in higher education versus other types of learning 	<ul style="list-style-type: none"> Reported outcomes are generally positive but estimates vary dramatically An area for further research is exploring methodological strategies for dealing with the heterogeneous and episodic nature of training activities

2. Empirical Evidence phase

Approach

The purpose of the empirical phase was twofold: The first objective was to generate new evidence on outcomes of various types of adult learning. The second objective was to test the usefulness and robustness of the analytical framework. Based on extensive consultation with HRSDC, we identified five principles to guide the development of a research agenda for this phase of the work. The five principles are as follows:

1. **Contributes to comprehensive test of framework** – The research program should reflect the breadth and depth of the *Typology* and the *Conceptual Framework*. Specifically, we aimed to include empirical papers that when taken together, would cover a range of learning types and a broad a range of components within the conceptual framework (inputs/outputs, intermediate outcomes, and financial and non-financial outcomes) as possible.
2. **Advances our knowledge base** – The research program aimed to provide new evidence by addressing gaps identified in the State of Knowledge Review. The contribution of the papers was assessed in terms of the strength of the research design according to the hierarchy of evidence presented in the Practical Guide. Some of the papers aimed to develop innovative approaches to estimating returns.
3. **Policy relevant** – In addition to methodological rigour, empirical papers were selected based on the extent to which they address policy relevant questions.
4. **Complements ongoing research agendas** – Empirical papers were carefully selected to ensure that they complement existing research currently underway.
5. **Lays groundwork for future research** – Finally, the research should lay the groundwork for a further program of research that can contribute to the policy making and program development process in the area of adult learning.

The empirical evidence includes two types of papers. The first category of papers focuses on generating empirical estimates of returns to various types of adult learning using the most rigorous methods possible given existing data. The second category is more exploratory in nature and includes papers that propose new designs or scope out strategies to exploit new data sources.

Generate Estimates	Develop innovative approaches
<ul style="list-style-type: none"> • Address knowledge gaps as identified in State of Knowledge • Consider types of adult learning as defined in the Typology • Consider range of outcomes as defined by Conceptual Framework • Use credible methods as defined in Hierarchy of Evidence • Provide feedback on application of framework to existing data sources 	<ul style="list-style-type: none"> • Propose new research designs and develop approaches to capture outcomes that are harder to measure and/or • Scope out strategies to exploit new data sources

Research program

After extensive consultation with HRSDC, six papers were selected for the research program. Table 1 provides a list of the six papers.

Table 1 Research program

Title	Author	Type of paper	Type of learning
1. Does adult training benefit Canadian workers?	Wen Ci, Jose Galdo, Marcel Voia, and Christopher Worswick	Generate estimates	Higher education and workplace-related
2. An analysis of a foundational learning program in BC: the Foundations Workplace Skills Program (FWSP) at Douglas College	David Gray and Louis-Phillippe Morin	Generate estimates	Foundational
3. Adult learning inside firms: Evidence using performance management records	Chris Riddell	Generate estimates	Workplace-related
4. A typology of adult learning: Review of the Social Research and Demonstration Corporation of Canada's Model	Kjell Rubenson and Maren Elfert	Innovative approaches	All types
5. Social finance and employment and training programs	Karen Myers and Natalie Conte	Innovative approaches	All types
6. Enhancing research opportunities on the returns to adult learning with national survey and administrative data sources	Marc Frenette, Douwere Grekou, and Ted Wannell	Innovative approaches	Higher education, other labour market-related

These six papers, taken together, cover all the major types of learning specified in the Typology. Three papers aim to generate estimates of the outcomes of adult learning activities. Among these papers, one paper estimates outcomes of foundational learning, another focuses on workplace-related learning, and the third focuses on both workplace-related learning and higher education. Together these papers cover a range of outcomes as specified in the conceptual framework including those that accrue to firms and individuals. However, we note that due to data limitations of existing survey data, the bulk of outcomes studied are financial outcomes.

The remaining three papers do not estimate outcomes or returns to training but rather explore innovative approaches in the field: *A Typology of Adult Learning: Review of the Social Research and Demonstration Corporation of Canada's Model* affords an empirical test of the Typology itself; *Social finance and Employment and Training Programs* explores innovative approaches to funding adult employment and training programs; and *Enhancing Research Opportunities on the Returns to Adult Learning with National Survey and Administrative Data Sources* explores innovative approaches to exploit under-utilized data sources for the purpose of measuring returns to adult learning.

As we developed the research program we aimed to ensure that the results would contribute to our knowledge base. Table 2 provides summary of the specific intended contributions of each paper.

Table 2 Summary of the contribution of each paper

Type of learning	Title	Contribution
Higher education and workplace-related	Does adult training benefit Canadian workers?	Provides rigorous estimates of individual outcomes for training in which individuals participate both in and outside of workplace. Addresses policy relevant sub group of adults with lower education and addresses the episodic and complementary nature of various types of adult learning.
Foundational	An analysis of a foundational learning program in BC: the Foundations Workplace Skills Program (FWSP) at Douglas College	Analyzes intermediate outcomes (skills gains) associated with foundational learning. Lays groundwork for rigorous cost benefit study.
Workplace-related	Adult learning inside firms: Evidence using performance management records	Explores an innovative approach to estimating returns to workplace training and assesses the extent to which it is a valid approach and whether it generates policy relevant findings.
All types	A typology of adult learning: Review of the Social Research and Demonstration Corporation of Canada's Model	Provides a systematic test of the typology using participation data, international comparisons, and provincial case study. Provides direction on how typology can be applied to ASETS.
All types	Social finance and employment and training programs	Examines potential of various social finance approaches to improve outcomes of employment and training programs.
Higher education, other labour market-related	Enhancing research opportunities on the returns to adult learning with national survey and administrative data sources	Explores opportunities to exploit under-utilized admin data to address questions that can't be addressed with existing survey data.

3. Discussion and conclusions

Robustness of the Analytical Framework

Overall, the various elements of the Analytical Framework, with the exception of the Typology, have stood up well to the testing inherent in the empirical studies. This section discusses the strengths and weaknesses of each Analytical Framework component.

Testing the conceptual framework

A motivating hypothesis for the *Adult Learning and Returns to Training Project* is that policies to encourage adult learning may not only improve individual life chances but also benefit the larger society and economy and generate public returns long after assistance has ended. In line with this hypothesis, the Conceptual Framework was developed with the intention of expanding the perspective beyond narrow economic outcomes like labour market earnings to cover a range of non-financial outcomes at both the individual and societal levels. With this starting point one could imagine a rich and nuanced research agenda that enabled researchers to rigorously specify the wider benefits of adult learning and thus provide policymakers with credible evidence that could be used to inform the optimal level and type of investment in adult learning programs. While this was the intention for the empirical phase, we very quickly ran up against the limitations of existing data sources. Since budget and timeframes did not permit the collection of original data, the research agenda for the empirical phase, necessarily became narrower in scope than was originally suggested by the conceptual framework.

In the end, the papers primarily focused on intermediate and individual financial outcomes. Although, we note that all studies included a secondary focus on other types of outcomes. For example, Ci et al. look at individual non-financial health outcomes; Gray and Morin look at the individual non-financial outcomes of returning to school; and Riddell looks at firm-level financial outcomes. Notably, none of the studies explored social outcomes or “spill-over” effects. This is an important gap since our State of Knowledge review concluded that attainment of secondary and post secondary education is associated with substantial societal benefits. Establishing whether these benefits also accrue to individuals who obtain their credentials later in life is an important area for future research.

However, even within this narrower focus, the authors’ attempts to operationalize non-financial outcomes identified by the framework quickly ran up against data limitations associated both with existing survey data and with data typically collected by firms and social programs. A key finding of the empirical phase is that standard surveys have a great deal of difficulty measuring returns to adult education and training. In particular, non-financial and social returns are difficult to capture in standard datasets in manners that bear a strong relationship to adult learning. For instance, Ci et al. report being most of the non-financial outcomes captured by the Survey of Labour and Income Dynamics (SLID) are not suitable as proxies for measuring non-financial and societal outcomes associated with adult learning. Gray and Morin also run into difficulty in measuring final outcomes due to a data set with gaps and a data structure not amenable to the empirical analysis of final outcomes.

Nonetheless, there was strong agreement among the authors of the empirical papers that the Conceptual Framework was a useful tool to encourage them to consider the wider potential benefits of adult learning and to provide a framework for distinguishing between intermediate and final outcomes. The authors did not identify any challenges to the framework at a definitional or conceptual level. There is general consensus among the researchers involved in this project that the Conceptual Framework makes important distinctions that can help to identify areas in need of further research. For instance, an important distinction is made between intermediate and final outcomes, a distinction that is particularly critical in the adult learning domain. By distinguishing between intermediate and final outcomes, the framework highlights the fact that while most studies exploring adult learning outcomes focus on intermediate outcomes such as learners' cognitive skills and self-confidence, there is a lack of evidence on whether these outcomes are actually effective predictors of the more fundamental outcomes of interest.

The Conceptual Framework also distinguishes between financial, non-financial and social outcomes, terms that are often employed inconsistently or confusingly in the existing literature. It also emphasizes the importance of inputs such as training design and quality, inputs that have been cited as important by experts and practitioners, but which represent a major gap in the existing literature. A wide range of factors, including individual and structural factors are also identified in the framework as worthy for consideration for estimating returns. Finally, given its broad and inclusive scope, the Conceptual Framework has the potential to reconcile evidence and investigative approaches from a variety of disciplines (economics, psychology, and sociology, to name a few) and fields (such as training and development, literacy, and education in the broader sense).

Practical Guide and Hierarchy of Evidence

Similarly, the hierarchy of evidence appeared to be a useful tool for distinguishing between different types of methodologies and research designs. Throughout the empirical phase, the authors embraced the terminology and distinctions mapped out in the Hierarchy of Evidence and no specific concerns were raised about this tool over the course of the empirical phase. Researchers involved in the project did note with some surprise the extent to which the bulk of existing literature within this area fell into the middle or lower tier. Several researchers suggested that governments should take advantage of policy changes as opportunities to conduct natural experiments and thus improve the quality of evidence in this area. In addition, researchers noted that it was difficult to design high quality research using existing survey data. Lack of appropriate data was consistently identified as a barrier to advancing our knowledge about what works and what does not work for adult learners.

State of knowledge review

The State of Knowledge Review was not directly tested in the Empirical Phase, however the researchers involved in this phase used the Review to situate their work and to clarify their specific contributions to our knowledge base. Researchers engaged in all phases of the project indicated that the Review was a useful tool for clarifying what we know and do not know about returns to adult learning.

Dictionary

Similar to the State of Knowledge Review, the Dictionary was not directly tested in the Empirical Phase. While we do not have detailed feedback on its usefulness, we do note that many of the researchers involved in the project continued to use their own preferred terms and definitions. Thus while researchers did not explicitly indicate any disagreement with the terms and definitions embedded in the Analytical Framework Components and annotated in the dictionary, it seems clear that it will take more active encouragement to implement a common vocabulary into everyday practice.

Typology

While the above Analytical Framework Components were generally favourably received and held up well throughout the Empirical Phase, the Typology did not fare as well. While some elements of the Typology are clearly useful, the generic application of the typology appears to be problematic. As Rubenson and Elfert (2013) point out, this is not different in principle from the conflict between UNESCO's ISCED and the Eurostat classification systems. It is extremely difficult, and perhaps impossible, to produce a generic typology for adult learning given its nature. If any future typologies are attempted, a key lesson to be drawn from the current experience is that for a typology to be successful it needs to be constrained to be relevant to a very specific context and/or policy question. Moreover, the focus of the typology needs to be made clear to those employing it so that it is neither misapplied nor deemed unsuccessful by virtue of being inapplicable to a context for which it was not designed.

What has also become apparent in the research exercises undertaken here is that standard surveys have a great deal of difficulty measuring returns to adult education/training/learning. In particular, nonfinancial and social returns are difficult to capture in standard datasets in a manner that bear a strong relationship to adult learning. In contrast, traditional labour market outcomes, especially earnings, appear to be quite strongly related to adult learning investments.

What did we learn about adult learning?

Our State of Knowledge Review Report provided an analysis of the empirical evidence on the outcomes associated with participation in adult learning. Consistent with our conceptual framework, our review considered the literature on three types of adult learning – foundational, higher education and workplace – for a wide range of financial and non-financial outcomes, for individuals, firms and society.¹ The purpose of the review was not to provide an exhaustive review of the field but rather to provide to consolidate knowledge and to identify gaps and areas for further policy relevant research. This section briefly summarizes what we learned from this exercise. We summarize our knowledge base according to types of learning and components of our conceptual framework.

¹ As we discuss in the report, we did not identify any studies that looked specifically at types of learning that would fall into our “other-labour market related learning category”. This is somewhat surprising given that a large proportion of government spending on adult learning is on short courses that provide a specific certification like forklift operator but are not part of a program that leads to a formal credential, are not foundational learning and are not directly related to an individual's current workplace .

Foundational learning

Inputs: Design matters, all learning is not created equally – Little systematic evidence exists on the relationship between inputs and outcomes. However, there is emerging evidence to suggest that quality in terms of the program design and instructional delivery matters. Examples of inputs that may matter include whether learning activities include a work experience component, the opportunity to earn a credential that is recognized by employers in the local labour market, and whether instruction promotes learning transfer by using authentic workplace materials. This is an important insight with significant implications for how future research is designed, especially given that standard surveys typically do not adequately capture these design features.

Outputs: More is not necessarily better – We are not aware of any studies that rigorously investigate the relationship between outputs and outcomes. The existing literature is overly dependent on one-dimensional output measures, and there is general agreement among expert practitioners that typical output indicators such as contact hours are only weakly if at all associated with outcomes of interest. Moreover, given that most studies do not account for self-paced study outside the classroom, what is officially reported as contact hours may only be part of the story. This is an important finding since research and public policy in this area often explicitly assumes that more is better. For example, countries where individuals spend the most hours in training are often considered leaders in this domain.

Intermediate outcomes matter only if they are predictors of final outcomes of interest – In terms of intermediate outcomes, evidence on human capital gains is mixed, and no clear patterns emerge by country or by provider. There is some evidence for psycho-social capital as an outcome of adult learning; for instance, several studies report gains in self-esteem and self-efficacy using standardized instruments. Evidence on social capital is weak. While several studies report gains, they do not usually meet the standards of evidence quality. Most importantly, we do not know the extent to which intermediate outcomes are actually related to final outcomes of interest. This is important since self-confidence and increased confidence are not usually valued in themselves but rather valued to the extent to which they enable individuals to increase their social and economic well-being.

Individual final outcomes may differ by types of intervention and types of learners – Evidence on the relationship between adult learning and financial outcomes is mixed: while some interventions are evaluated with random assignment and show modest impacts, other interventions using observational measures show small employment impacts but no earnings impacts. Although we usually think of positive selection as an issue, in the case of foundational learning, negative selection may be a more important issue. Negative selection may be an important factor in observational studies.

Very few studies look at non-financial outcomes of foundational learning specifically. There is a large literature on the impact of obtaining a high school diploma in general. Although causality was an issue in early studies, more recent studies take advantage of exogenous change in compulsory schooling laws and find significant impacts related to health and wellbeing. However, we do not know if similar impacts would apply to high school obtained later in life or if they would apply to other types of foundational learning. This is an important issue since it is entirely plausible that timing matters.

Firm final outcomes: evidence is anecdotal at best – There is little academic literature specifically on foundational training as it relates to firms. The literature that does exist is based largely on exploratory case studies providing anecdotal evidence. In general, studies fail to investigate actual outcomes such as skills gained and reduced error rates. Several case studies that employ quantitative methods report large returns on investment (ROI), these studies contribute to our knowledge base but some have notable methodological limitations. We note that SRDC is currently conducting several more rigorous studies on foundational learning in the workplace. Results will be available in late 2013

Social final outcomes: capturing the full value of foundational learning – Virtually no studies look at social outcomes of foundational learning specifically – only high school in general. Similar to studies on private non-financial outcomes, early studies suffered from causality issues but more recent studies take advantage of exogenous change in compulsory schooling. These studies find significant impacts related to civic engagement (e.g., voting), taxes and transfers, and crime. However, it is unclear whether the same benefits would be associated with obtaining a diploma later in life or if similar benefits would be associated with other types of foundational learning, such as literacy and essential skills training. This is a major gap since, if the same types of social benefits are realized for those who obtain skills later in life, the pay off would be substantial.

Higher education

Inputs: Making higher education more responsive – Although there is no systematic evidence, there is considerable exploratory evidence suggesting that higher education inputs matter for outcomes. There is growing recognition by policy makers and other experts that standard measures of inputs such as expenditure per student are only weakly if at all associated with desirable outcomes for adult learners. There is emerging evidence to suggest that design features are a key input, and that the current higher education system is not responsive to the needs of adult learners.

Outputs: which ones are most important? – We are not aware of any studies that investigate the relationship between outputs and outcomes of higher education, but standard output indicators like credits obtained are likely relevant.

Intermediate outcomes: Are there intermediate outcomes that predict persistence? – We are not aware of any research that systematically examines intermediate outcomes associated with participation in higher education. This may be a promising area for further research as intermediate outcomes may be useful in providing early indicators of which adult learners are struggling and perhaps drop out and which are mostly likely to persist and successfully complete their program of study.

Individual final outcomes: higher education pays off later in life – There is strong evidence to suggest that in general, adult learners who engage in higher educational experience financial gains such as earnings gains. The returns are roughly the same as when the schooling is acquired earlier in life, which are fairly large and have been estimated using convincing methods. Though selection bias is not accounted for in these studies, findings are consistent across variety of datasets and studies are strengthened by longitudinal designs and well-defined measures. Despite the consistently high earnings premiums found in this literature, we are not aware of any studies that evaluate higher education in the context of a cost-benefit analysis framework.

We are not aware of any studies that directly investigate the relationship between adult participation in higher education and individual non-financial outcomes. There are numerous studies that examine non-financial outcomes such as health practices and intergenerational effects associated with participation in higher education in general (regardless of whether it is pursued later in life). However, we do not know if similar outcomes are associated with participation in higher education later in life.

Firm final outcomes: an unexplored area – We are not aware of any studies exclusively focused on the outcomes experienced by firms as a result of their employees participating in higher education learning opportunities versus other types of learning.

Social outcomes: capturing full value – We are not aware of any studies that directly investigate the relationship between adult participation in higher education and social outcomes. There are however, numerous studies that examine social outcomes associated with participation in higher education in general (regardless of whether it is pursued later in life). Key outcomes in this literature include savings to the tax and transfer system, savings to the health care system, reductions in crime; improved civic engagement and social cohesion; and knowledge spillovers which may generate increased wages and productivity even for those without postsecondary credentials. Again, we do not know whether similar outcomes are experienced by adults who participate in higher education later in life.

Workplace learning

Inputs: again quality likely matters a lot – We are not aware of any studies that systematically investigate the relationship between inputs and outcomes. However, there is a consensus among training and development theorists and expert practitioners that the most important activity required to generate positive returns on investment from a workplace training intervention is to ensure that the intervention is aligned to the business needs of the organization. This is an important consideration for policy makers who wish to encourage firms to provide more training.

Outputs: metrics that matter – We are not aware of any studies that systematically investigate the relationship between training outputs and outcomes of interest but again, there is general consensus in the training literature on which output metrics matter, such as the costs per learner for design and delivery and learner reaction and satisfaction.

Intermediate outcomes: focusing on job performance – We are not aware of any research that systematically investigates the relationship between participation in workplace-related training and gains in human, social, or psychosocial capital. Some in-house evaluations of workplace training attempt to measure skills gains, but from an employer standpoint, the more important question is typically whether learners improve their workplace practices/performance as a result of training. Corporate training and development experts and practitioners point to the need for opportunities to apply new skills on the job and a “nesting period” to consolidate and reinforce new skills in order for learning transfer to occur.

Individual final outcomes: on average training pays off – There are numerous studies that investigate the extent to which individuals benefit financially from participating in workplace learning. The literature is consistent in finding positive wage-returns to workplace-related training but estimates vary dramatically. As expected, returns are lower once self-selection into training is taken into account.

Recent studies using more sophisticated statistical methods to take endogenous training decisions into account thus find much lower wage-returns than earlier studies. Our best estimate would be that wage returns to training are positive but small. Still, even at these low levels, in-company training may explain most of a worker's within-firm wage growth.

Most of the literature related to non-financial outcomes has focused on the impact of education and skills on job satisfaction rather than the effect of training, as such. There is also emerging evidence that workplace-related training is also associated with non-financial outcome like job satisfaction. Note that although studies find large and highly significant relationships, they are unable to shed light on the causal nature of relationship. It is unclear whether training causes satisfaction or satisfaction causes training or even whether the relationship is spurious with a third unidentified factor causing both outcomes.

Firm outcomes: hard to measure – There are relatively few studies measuring the impact of training on an objective measure of a worker's productivity. Many studies that do so use relatively small samples, so their results are not necessarily generalizable. Also, most of the earlier studies from the 1990s do not attempt to take into account the fact that only workplaces that perceive positive net benefits for undertaking training will do so, and that demand conditions may affect both productivity and training simultaneously. A number of recent studies have overcome some of these limitations. Estimates from these studies are generally quite large (larger than wage effects) but estimates vary dramatically. Very few studies compare the benefits of training to its cost.

Finally, the literature is still in its infancy when it comes to estimating the impact of firm-sponsored training on other measures of firm-level performance, such as innovation. Factors leading to innovation are not well understood, although preliminary research seems to indicate that human capital investments are an important determinant of the innovation performance of the firm.

Findings from the Empirical Phase

The three empirical papers in our empirical phase helped advance our knowledge about what works with adult learning. All of the three empirical papers, focusing on different types of learning with different datasets, find that learning is associated with positive outcomes such as wage growth, cognitive skills gains, improved job performance ratings and career progression/promotion. Using SLID data, Ci et al. find strong evidence that employer-supported non-formal and higher education pays off in terms of wage gains, especially among women. The authors note that these gains are large relative to most estimated gains for full-time university education. These findings are consistent with the existing literature on both workplace training and higher education and provides confirmation that, at least on average, human capital investments pay off for mid career adults.

Gray and Morin find large and significant gains in cognitive skills among adult learners of a foundational learning program, particularly among those who scored lower in a pre-training skills test, although gains were not correlated with the probability of finding employment or returning to school. However it is unclear the extent to which this lack of relationship is associated with the way program data is collected. Thus, while this paper aimed to make a contribution in terms of advancing our understanding of the extent to which intermediate outcomes, like skills gains, are associated with final outcomes, like employment, the actual contribution was constrained by data limitations. Indeed the

major contribution of this paper is to provide an outline of what type of program administrative data is needed to rigorously study a program's effectiveness.

Using data from firms' performance management systems, Riddell finds that workplace-related learning has a direct effect on employees' performance ratings, which indirectly affects career progression and wage growth. Riddell's paper provides a rare detailed look at the types of training that firms may provide. In addition, this paper provides a template for further case study work at the firm level.

Agenda for future research

Despite a substantial body of research on adult learning, as our State of Knowledge Review concludes, there are still significant gaps in our knowledge base. These gaps are significant given the level of public investment in this policy domain. This section identifies eight questions that arise from the key findings of our State of Knowledge Review and could form the core of a policy-relevant, future research agenda on adult learning. The types of data and designs that would be required to address these questions are briefly noted. Data gaps and needs are discussed in more detail in the next section.

1. *What types of foundational learning designs work best with which types of learning?* A major gap in the literature on foundational learning is the types of program designs that work best with different types of learners. Emerging research suggests that design matters and may play a significant role in explaining results that range from negative to highly positive. Future research should directly compare different designs for different subgroups of learners. To be credible, this type of research would need to take advantage of naturally emerging experiments or involve social experiments with participants randomly assigned to program or control groups (See Practical Guide for discussion of these terms).
2. *To what extent are intermediate outcomes good predictors of final outcomes of interest for foundational learning?* A considerable amount of exploratory research on foundational learning has focused on capturing changes in intermediate outcomes such as skills gains or increased self-confidence. However there is very little understanding of the extent to which gains in these areas are in fact good predictors of final outcomes of like wage gains and improved health and well-being. To be credible, this type of question requires program evaluations that capture pre- and post-learning outcomes and follow participants for a reasonable period of time. Research designs should also include comparison groups or ideally control groups.
3. *What are the non-financial and social outcomes of foundational learning?* Do foundational learning activities result in similar non-financial and social outcomes to those reported in the wider K-12 education literature and the literature on literacy skills? Does government-sponsored training of older unemployed workers in vulnerable communities improve the health of its participants, and thus, reduce the burden on health care costs? Do government-sponsored training programs aimed at under-employed youth reduce crime? This is an important question that may have significant implications for understanding the optimal investment in adult learning. This type of research question could be answered with data from the types of survey and administrative data linkages discussed in the paper by Frenette, Grekou and Wannell.

4. *How can participation in higher education be encouraged?* There is strong evidence that, on average, investing in higher education later in life pays off. We also know that very few working age adults participate. Thus a key policy issue is how to increase participation. We also know from recent efforts by provincial governments, such as Ontario, that large scale efforts to increase participation do not necessarily result in optimal responses. This is important because not everyone is well-suited for longer term formal investments. There is considerable evidence to suggest that a non-trivial proportion of adults who return to school later in life experience difficulty in completing their programs. Moreover, adults often have difficulty determining whether there is labour market demand for the programs they are interested in. Future research should focus on how to make higher education more responsive to the needs of both working age adults and employers. The Career Pathways approach identified in the State of Knowledge review is a promising area for further research. This type of question would be best tested by pilot testing promising models.
5. *How do returns to higher education differ by institution and program?* Before implementing any effort to encourage participation in higher education, it is critical to have a better sense of how returns vary by institution and program. This type of question can be answered through strategic linkages of administrative databases (See Frenette, Grekou and Wannell, 2013 for discussion of the linkages required).
6. *What types of short courses are effective in improving the labour market prospects of economically vulnerable workers?* Our State of Knowledge Review demonstrated that we know little about the relative effectiveness of numerous short courses that adults participate in that are neither foundational or higher education and are not related to an individual's current work. Examples of this type of training include workshops, courses, or seminars offered by professional institutes to help individuals change careers; continuing education courses not part of a credentialed program; courses offered by private or non-profit organizations that focus on specific skills such as project management, or computer software; and short courses funded by Skills Development such as First Aid/CPR/AED. Priority should be given to research that assesses the extent to which these types of short courses are effective. Further scoping needs to be done to determine the extent to which existing files capture the level of detail needed about the type of learning to be useful.
7. *Do government-sponsored training programs have long lasting effects?* Governments make substantial investments in helping individuals who are unemployed re-enter the labour force but we still know little about which types of interventions work best and whether these interventions have a long term pay off. Questions of interest include: what are the returns to re-training following lay off; what is the role of training on the dynamics of EI claims; and do government-sponsored training programs have long lasting effects on outcomes such as employment, earnings, and low-income? Again, this type of question can be answered through strategic linkages of administrative databases (See Frenette, Grekou and Wannell, 2013 for discussion of the linkages required).
8. *How can employers be encouraged to provide more training of higher quality?* The key knowledge gap in workplace training is which types of workplace training are most effective in improving outcomes of employees and the firm's bottom line. This type of question could theoretically be answered with survey data as long as the data included detailed information about the type of

training provided over a period of several years, as well as key outcome measures of wages and productivity.

Future data needs

This section draws on the work of Frenette, Grekou and Wannell (2013). As part of the empirical phase these authors were engaged to systematically review the data resources of Statistics Canada and HRSDC with respect to their utility in supporting research on the returns to adult learning. They identify many opportunities associated with better linking of administrative databases. In general they conclude that administrative data sources offer more potential to study final outcomes than existing survey data sets. By linking files within departments and across departments, the range of policy-relevant questions that could potentially be answered would be substantially broadened. However, they also identify many limitations to which careful attention should be paid. The key findings of this work are discussed below.

Linking Statistics Canada files

The authors identify several opportunities associated with linking files at Statistics Canada. Strategic linkages would make it possible to estimate the returns to long-term economic outcomes such as employment, earnings and repeat use of EI benefits. Other linkages would bring a broader range of outcomes of interest: firm performance, individual health outcomes, social assistance use, and contact with adult courts. In these analyses, adult learning could include detailed types of programs, such as many types of foundational training, including perhaps second language training for immigrants.

Linking HRSDC files

The authors also suggest that the benefits of linking HRSDC files together are perhaps less obvious, given both the absence of long term outcomes and valid comparison groups in most cases. This is because many HRSDC files only contain information on program participants. Nevertheless, some questions could be answered through record linkages. For example, it is possible to estimate the returns to specific EI-sponsored training programs on EI claims and benefits. A related issue that could be examined is the relationship between adult learning and savings for the postsecondary education of one's children.

Linking Statistics Canada and HRSDC files together

There are also opportunities associated with linking HRSDC and Statistics Canada datasets. Such linkages would allow researchers to estimate the returns to participating in specific, government-sponsored training programs on a variety of economic and non-economic outcomes. There are a large number of data files held at Statistics Canada that contain a wealth of non-financial outcomes that could, in principle, be linked to program participation data. Most of these files are longitudinal in nature, which would provide much credibility to the estimates.

Limitations, gaps, opportunities moving forward

As Frenette, Grekou and Wannell point out, the search for better and better data will always hit a wall at some point, mainly due to costs but also due to quality issues associated with the imperative for both broad ranging and in-depth data. The alternative is to use both program knowledge and other sources of data to create reasonable counterfactuals.

Many programs are not distributed evenly across the country and/or were introduced at different times in different regions. These situations offer opportunities for natural experiments. The combination of knowledge about such variations in program delivery and the detailed geographic information available in the tax files gives researchers the opportunity to employ econometric techniques to construct reasonable counterfactuals.

Frenette, Grekou and Wannell make four suggestions to improve the quality of data associated with public investments in adult learning.

- First, although the shortcomings of sample surveys as a primary source of program evaluation are significant, these types of surveys can be a good source of comparisons between adult learners and non-learners due to their inclusion of a wide range of relevant socio-demographic information. Since LISA is the sole longitudinal household survey still be collected by Statistics Canada, HRSDC should ensure that adult learning information adequate to provide general information on the returns to adult learning is collected by the survey.
- Second, since programs vary across and within provinces and some provinces are already developing learning program performance management systems, data sharing agreements between HRSDC and the provinces could significantly increase the evaluation opportunities among programs with similar goals. Although comparable information on non-participants would remain a gap, this type of sharing can help to identify best practices in the targeting and delivery of programs.
- Third, further opportunities should be explored to add more socio-demographic information to the tax-based files. As noted in the paper, occasional linkages to the long-form census (now the National Household Survey) can add static socio-demographic information for large, cross-sectional samples at five-year intervals. Another possibility would be to assess the possibility of coding the occupation information collected on the T1 tax form. Having occupation in conjunction with program participation and longitudinal earnings would greatly improve the ability to create meaningful comparison groups of non-participants.
- Finally, since good administrative data is maintained for employer outcomes, some means of linking information on their employees' learning activities is required to support estimates of the returns to training for employer outcomes. Since work on a replacement for the Workplace and Employee Survey was recently cancelled, other options might be considered. Links to program information through the tax files is conceivable, but would only cover a limited range of the adult learning activities of employees. Thus occasional employer surveys of training and related learning activities that could be linked to longitudinal firm outcome data comprise one of the only feasible options.

Frenette, Grekou and Wannell (2013) acknowledge that all of these activities would require considerable resources to create new analytical opportunities. Given current constraints on data collection and linking activities, they should thus not be considered in isolation. Rather the costs, potential benefits and likelihood of achieving those benefits should be considered across the range of opportunities in order to maximize the return on investment of public funds.

Conclusions

This is the final report for the *Adult Learning and Returns to Training Project*. Its purpose was to provide a high-level overview of each of the project phases and to provide a discussion of the key contributions of this project, including a discussion of data needs and preferred research designs to inform future research agendas. Section 1 provided an overview of our approach to the Analytical Framework phase and a high level summary of the major components that resulted from this phase. Section 2 summarized our approach to the Empirical Evidence phase. It also provided a high-level overview of the research papers developed for this phase. Section 3 presented an analysis of the robustness of the Analytical Framework based on the results of the Empirical Evidence phase. We also summarized the state of knowledge on the returns to adult learning. Finally, we conclude with a discussion of data needs and provide the potential building blocks for an agenda for future research for estimating returns to adult learning.

For more information about this project, see either the summary reports or full reports for each component of the analytical phase. Final drafts of each of the empirical papers are also available.