

# The Centre for Literacy

Le centre d'alphabétisation

EXECUTIVE SUMMARY

## Meeting Expectations:

Measuring the Impacts of  
Workplace Essential Skills Training

FINAL REPORT

Measures of Success Project

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March 2013

## Acknowledgements

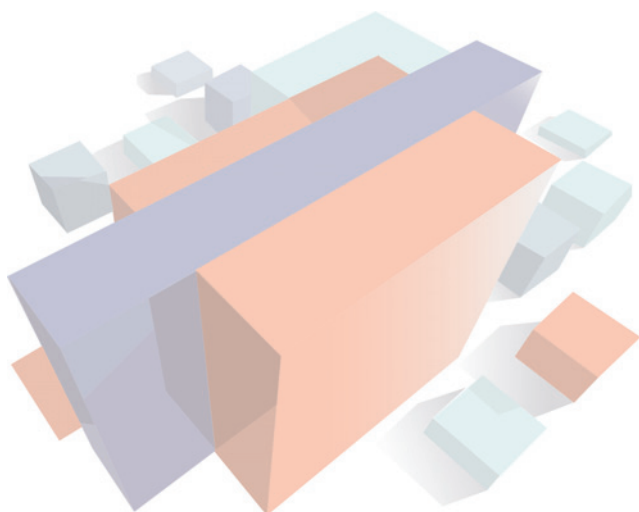
*Measures of Success* (MoS) was a national research project designed to assess the outcomes of workplace literacy and essential skills initiatives beyond immediate end-of-program results. It was carried out through a partnership between The Centre for Literacy, Essential Skills and Recognition of Prior Learning (RPL) – Industry Workforce Development Manitoba Entrepreneurship, Training and Trade (formerly Workplace Education Manitoba), and Nova Scotia’s Workplace Initiatives Program in the Department of Labour and Advanced Education, and was managed by The Centre. Funding was provided by the Office of Literacy and Essential Skills, Human Resources and Skills Development Canada.

Research for *Measures of Success* was designed and implemented by the Social Research and Demonstration Corporation (SRDC). SRDC is a non-profit research organization established in 1991 specifically to develop, field test, and rigorously evaluate new programs. The SRDC mission is to help policy-makers and practitioners identify policies and programs that improve the well-being of all Canadians, with special concern for the effects on the disadvantaged, and to raise the standards of evidence used in assessing these policies.

This project would not have been possible without the support of many individuals and organizations. Project Manager Kathleen Flanagan kept MoS under control and on track for three years. Special thanks to members of our Steering Committee (in alphabetical order): John Benseman, Joe Brown, Jocelyn Charron, Vicky Elliott-Lopez, Sandi Howell, Sheila Kingswell, Judy Purcell, Linda Shohet and Kimberly White.

Field researchers Leah Goodwin and Kaye Grant in Manitoba and Emma Spencer in Nova Scotia collected data on the ground and provided valuable feedback during and after the research ended.

Last, but perhaps most important, we recognize the eighteen employers who engaged as sites of research and to the 226 employees who agreed to three intensive interviews before and after their training programs. All the employers received confidential site reports that we hope they will find useful in developing future skills training initiatives.



### **Meeting Expectations: Measuring the Impacts of Workplace Essential Skills Training** **EXECUTIVE SUMMARY**

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## 1. OVERVIEW

The *Measures of Success* project (2009-2013) developed and tested an evaluation model to assess longer-term outcomes of workplace education programs for increasing literacy and essential skills (LES). The model was tested at 18 work sites in two Canadian provinces – 10 in Manitoba and 8 in Nova Scotia.

### **Key Research Questions:**

*Measures of Success* addressed three questions:

1. What are the long-term outcomes of workplace LES initiatives in Manitoba and Nova Scotia on the participants, workplaces, and companies (longer-term is defined as six months after start of training)?
2. What is a valid and reliable model for evaluating longer-term outcomes of workplace LES initiatives? What are the appropriate measures?
3. What are effective and efficient ways to provide workplace LES initiatives to maximize positive long-term outcomes?

The evaluation framework was developed through consultations with key stakeholders and subject-matter experts, and an extensive review of relevant literature and prior case studies. The evaluation strategy included:

- 1) a methodology to capture outcomes of literacy and essential skills training based on a theory-driven multi-site case study approach;
- 2) a rich evaluation framework that specifies a range of contextual variables, mediating factors, and outcomes of training at the individual and business level; and
- 3) survey instruments and protocols to collect data.

The research design included criteria for selecting sites. It described the recruitment process and training delivery and proposed three waves of data collection, at baseline before training began, and at three and six months after it began.

The Final Report focused on the longer-term results at 6-months after training onset. It reviewed the design and implementation of the project and described the profile of the participating businesses and workers and the training. It assessed changes in key participant and business outcomes which may have been affected by the LES training intervention. It explored the relationship between key contextual factors, the characteristics of participants and businesses, and the observed outcomes to offer further evidence of their link to training and to better understand the conditions that influence training success. Finally, it recommended revisions to the research tools to make them more reliable instruments to capture outcomes of LES training, and to require less time from participants and employers.

This summary provides an overview of the project design and findings, beginning with outcome highlights.

## Outcomes

The *Measures of Success* evaluation design was effective in measuring longer-term post-training gains across a broad spectrum of outcomes including human capital, social capital, well-being, and a rich set of performance measures for participants and businesses.

Statistically significant improvements in outcomes related to **human capital** included:

- Increased **confidence in work-relevant literacy skills** such as technical skills and math skills trainees needed to do their main job well
- Increased **confidence in everyday literacy skills** such as reading, writing, math, and computer use
- Increased **practice of everyday literacy skills**, especially reading

Beside direct gains in skills and practices, there were improvements in several mediating factors that may act indirectly to facilitate further skill development and longer-term performance improvement. These include:

- **Improved social capital**, such as network size and composition
- **Enhanced cohesion**, such as increased trust
- **Increased well-being**, including satisfaction with life and work

Improvements in eleven different **job performance indicators** were reported by participants. As well, a majority of firms reported a number of business outcomes explicitly linked to training.

- **Productivity gains** included things such as completing tasks more accurately with fewer errors, planning time more effectively, and using workplace documents and equipment more effectively.
- **Improvements in Interpersonal relations** included better communication with co-workers and customers, and ability to respond to customer questions and concerns.
- **Businesses reported training-related improvements** in a variety of areas including both tangible and intangible outcomes. At least half of participating employers reported training-related improvements in *productivity, employee-management relations, learning culture, and costs and errors*.

*Measures of Success* findings suggest that workplace LES training may work for groups often thought to benefit less from training. Post-training gains were seen among a range of learners, including those with lower education, immigrants with English as a second language, and older workers.

- **Lower levels of educational attainment:** Participants with high school or less were as likely to show post-training gains or to report improvements in job performance as those with college or university credentials.
- **Immigrants who commonly use languages other than English at home:** Immigrants who likely used English as a second language (ESL) were as likely as Canadian-born participants to show post-training gains. ESL participants were more likely than others with similar characteristics to report improvements in a number of job performance areas.
- **Older workers** (age 45+) were as likely as younger and prime-aged workers to show post-training gains or to report improvements in job performance.

The rest of this summary describes in more detail the research design, evaluation model, and findings and implications.

## 2. THEORY OF CHANGE AND THE RESEARCH FRAMEWORK

The methodology in the *Measures of Success* project was based on a theory-driven multi-site case study. It used a theory of change approach that emphasizes the construction of a program logic model, outlining all the implicit assumptions about how an intervention is expected to produce a specific result and the steps that lead there. A logic model describes logical linkages among program resources, activities, and outcomes – it is a narrative or graphical depiction of a Theory of Change. It clarifies how the change process will unfold and places attention on the intermediate changes that need to occur in order to reach long-term outcomes. Figure 1 (See p. 4 ) shows the *Measures of Success* logic model and describes the components in detail.

The model includes the concepts of **Return on investment (ROI)** and **Return on expectations (ROE)**. ROI is the better known of the two; it is, however, very difficult without an experimental design both to collect data that allows a clear calculation of net benefit or cost of training and to establish causality between outcomes and the training intervention. *Measures of Success* did not use an experimental design. It was implemented in workplaces that were engaging in a training intervention that they would have done regardless of the project. The concept of **Return on expectations (ROE)** on the other hand, highlights the importance of aligning training goals and content to the specific needs of the organization by ensuring that the training aims to address the causes of performance gaps and contribute to business goals. These are the goals employers care about. The *Measures of Success* project was in large part an exercise in evaluating ROE.

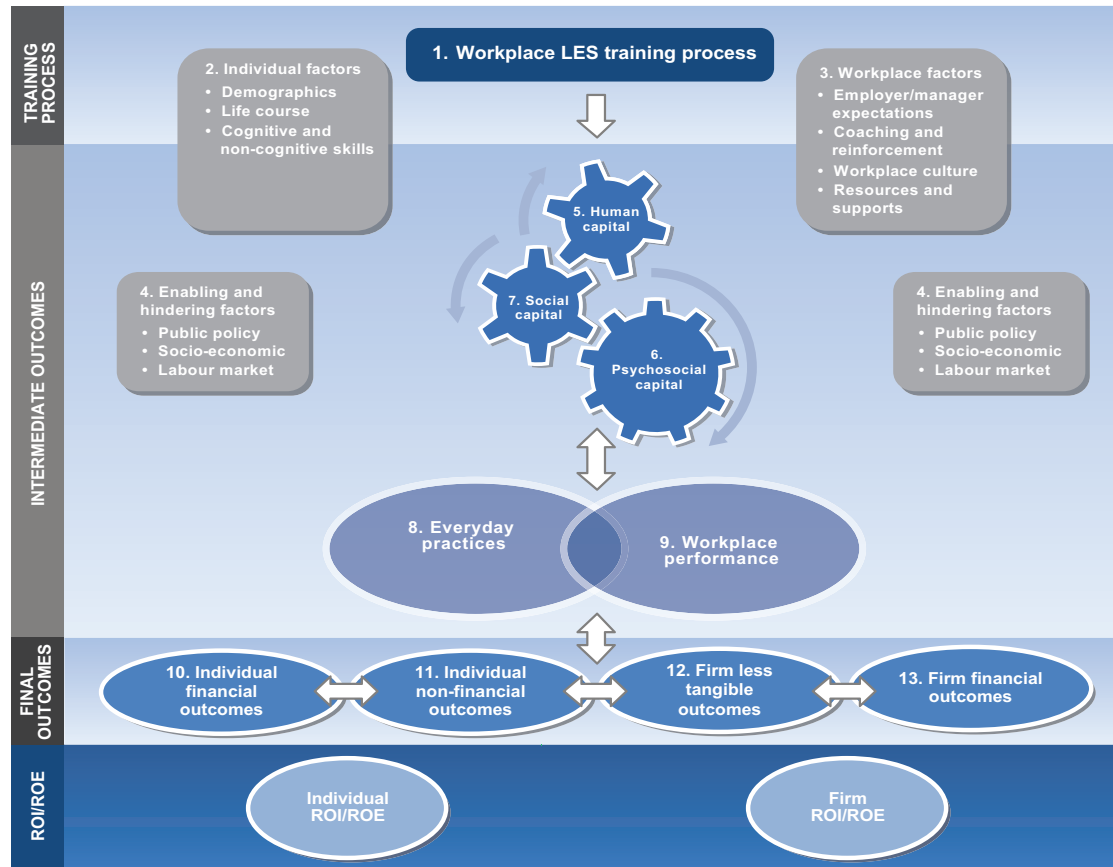
The key challenge in applying this research framework, analytically, is in determining when expectations have been met – not only on the longer-term outcomes of interest to the stakeholder, but on the intermediate outcomes that make up the change process. For example, regarding implementation factors, “how effective” does alignment between training and business results need to be? Or for mediating variables, “how much” social capital or literacy practices make a difference in supporting other positive outcomes? Or, for longer-term outcomes, “how much” performance improvement for the business or increased well-being for individuals is considered a success?

These “thresholds” for successful change on intermediate and longer-term outcomes can be drawn from several sources including stakeholder expectations, established benchmarks, or statistical comparisons with outcomes from related programs and participants. Of these, stakeholder expectations were the foundation for analyzing change in *Measures of Success*. Researchers collected expectations from several stakeholders including the Steering Committee, provincial coordinators, workplace educators, and employers. The expectations of employers – what motivates them and what they hope to achieve with the training – were particularly important for setting the thresholds.

While key stakeholders can provide clear direction in determining *what matters*, it is considerably more difficult for them to express *how much* something matters. As a result, stakeholder expectations are often used in conjunction with other benchmarks to determine if the magnitude of change is relevant. It is common in theory-driven case studies to compare outcomes to various benchmarks, either national averages, or, as was done for this project, to average outcomes for related programs and businesses.

**Figure 1: A logic model for estimating outcomes and returns to LES training in the workplace**

This figure should be read from the top, starting with the essential skills training and the learning process and ending with the longer-term outcomes. Between these are intermediate outcomes, many of which are hypothesized to influence the relationship between the workplace LES training process and the long-term financial and non-financial outcomes that individuals, businesses, and governments care about. Surrounding the model are some of the contextual factors that must be considered when capturing outcomes of adult learning.



1. The theory of change begins with the **LES training process**. It refers to the characteristics of the training activity, the resources employed, and the participants' engagement in and reaction to the activity.

**Outcomes** of the LES training are relevant skills levels, behaviours, and/or characteristics measured following a training activity, e.g. literacy score, self-confidence, earnings, and participation in workplace/everyday activities. *Measures of Success* focused primarily on outcomes for individual learners and participating businesses, inside and outside the workplace. After analysis, outcomes can be seen as having played either a *mediating* or a *moderating* role. Mediating factors explain how or why a relationship may exist between explanatory variables (educational attainment, for instance) and the variable of interest (or the dependent variable; in this case, skills development as measured by various indicators). Moderating factors specify the conditions under which an explanatory variable influences a dependent variable. They are typically not affected by training but can influence its effectiveness.

2. **Individual factors**, e.g. learners' engagement in the learning activity (e.g., attendance, active participation, completion of learning tasks) influence outcomes.
3. **Workplace factors** explain how workers apply gains from training to the job, including management expectations (e.g., awareness, intentionality, engagement) related to the training intervention. Factors include clarity of roles and expectations of staff; performance and training incentives; work systems and processes; workers' access to information, people, tools and job aids; and coaching and reinforcement.



**4.1. Enabling or hindering factors** at the individual level can include demographic characteristics (e.g. gender, age, initial skill and educational level, and attitude toward learning, individual lifecycle circumstances related to household income, marital status and family status). They also include the socioeconomic context and the policy, program and institutional environment.

**4.2. Enabling or hindering factors** at the firm level can include external factors, e.g. market conditions, social, political, policy, and institutional context, and workplace factors such as employment size. These may moderate the relationship between changes in workplace performance and longer-term outcomes of training.

The research framework distinguishes between *intermediate* and *long-term outcomes*. **Intermediate outcomes** are changes in the level of relevant skills, behaviours, and/or characteristics that have value in their own right, but may also support attainment of the long-term outcomes of interest. Workplace training has been assumed to lead to various intermediate outcomes including those related to:

**5. Human capital** (increased knowledge and skill level)

**6. Psychological capital** (such as changes in self-esteem and self-confidence), and

**7. Social capital** (increased network size and improvement in network quality)

The logic model includes two other sets of intermediate outcomes, which often intersect:

**8. Practices that individuals engage in their everyday lives**

**9. Workplace performance**

**Long-term outcomes** are those that may take longer to occur than intermediate, but are the ones that individuals, businesses and society ultimately care about. In workplace training, long-term outcomes can accrue to both employers (businesses) and individual learners, and may be financial and non-financial, and more or less tangible. **Non-financial individual outcomes** are those experienced by an individual worker or their family that do not directly affect one's wealth or income, e.g. improved individual or family health, and improved relations with family, friends, and colleagues. The broader adult learning literature identifies non-market outcomes of adult learning programs, including increased access to services, increased life satisfaction, improved health, lower stress, and improved relationships with family, friends and coworkers.

**10. Financial individual outcomes** affect an individual's wealth or income. Potential financial benefits for workers reported in the literature include better job quality (such as a safer workplace), career advancement and higher wages.

**11. Tangible business outcomes** include increased productivity, increased sales, cost control, improved product quality, improved customer service, worker retention, reduced absenteeism, and improved health and safety.

**12. Less tangible business outcomes** are those that cannot be easily quantified or monetized such as improved workplace morale, cohesion among co-workers, improved relations and trust between management and employees, and an enhanced culture of learning.

**Return on investment (ROI)** of training refers to the net cost or benefit of the training activity relative to the cost, and is frequently expressed as a ratio or a percentage. All benefits of the training are given a monetary value, summed, and compared to the costs, including the actual expenditure on (investment in) the training, to determine whether the program yielded a net benefit or net cost. Although this seems straightforward, this calculation requires adequate quantitative data that is difficult to collect. Another challenge is that it can be difficult to establish causality between outcomes and the training intervention without an experimental design.

**Return on expectations (ROE)** is the process of estimating returns to training relative to stakeholder expectations. Ideally, ROE should begin before the training intervention begins since it requires the training program to be tied to performance and business needs as expressed by key stakeholders. The term ROE was created to highlight the importance of aligning training goals and content to the specific needs of the organization by ensuring that the training aims to address the causes of performance gaps and in turn contribute to business goals, which are what employers care about.

Limitation: It should be noted that the current study measured "long-term" outcomes at only 6-months following the onset of training. Given this context, it was a significant challenge to detect long-term changes, particularly given the fairly modest number of training hours provided (i.e., under 40 hours per participant) compared to post-secondary forms of skills upgrading (e.g., vocational, college diplomas).

### 3. PROJECT IMPLEMENTATION AND TRAINING PROFILE

This section describes the processes and activities that led up to the delivery of the training programs at the 18 work sites, from the recruitment of businesses and participants, to the needs analysis, and the training plans, i.e. what and how it was delivered. It answers the following questions:

- How were employers and employees recruited for the training?
- What were employers' training motivations and business and performance needs?
- Which Essential Skills did the training target?
- What were some of the characteristics of the training, such as the length, location, and schedule?

#### ***Number of Businesses and Trainees***

- 18 employers were recruited for the project – 8 from Nova Scotia and 10 from Manitoba. In at least 10 of the sites, employers had previously participated in Workplace Essential Skills training programs delivered by either Manitoba or Nova Scotia.
- The total number of participants was 226. The number per site ranged from 6 to 20 in Nova Scotia businesses and from 7 to 30 in Manitoba. On average, about 12 participants were recruited per business; two businesses had more than 20 participating employees. Participation was reported to be voluntary for the majority (14 of 18) businesses, although in many cases, employees were encouraged to participate by their managers. Sometimes this encouragement was targeted to specific groups of employees.

#### ***Employer Motivation for Participating***

- All businesses were motivated to participate in the training to help address a pressing business need (e.g., to be more competitive, implement new systems in response to rapid growth). In some cases, the motivation was related to a specific business need (e.g., preparing employees to use new computerized technology). In others, a more general motivation was reported (e.g. improving communications both internally and with customers). *Measures of Success* employers were responding to an existing need, although 4 employers were preparing for a future need.

#### ***Essential Skills Targeted***

- A wide range of Essential Skills was targeted. In *Measures of Success*, the most common was oral communication skills, followed by thinking skills (including problem-solving and critical thinking), computer use skills, and working with others.

#### ***Training Hours, Class Size***

- Instructors and coordinators reported average total training hours per business (39) that were about three times greater in Nova Scotia than those in Manitoba (11). Class sizes ranged widely, from as few as five to as many as 26 per class, with an average of 12 to 13 participants per class.



## 4. SAMPLE CHARACTERISTICS AND CONTEXTUAL FACTORS

A profile of the businesses and workers in the *Measures of Success* project includes the industry, structure and size of the firms as well as some key socio-demographic characteristics of the learners. It provides an overall picture of the sample and some of the key contextual factors that may influence the pattern of training outcomes.

### *Size of Businesses*

- Of the 18 businesses, just over half were in manufacturing with the rest in services. The size varied greatly from a low of 43 employees to a high of 1,421. Based on Industry Canada criteria, half the businesses would be considered small, with fewer than 100 employees; five were medium-sized with more than 100 but less than 500 employees, and four were large with more than 500 employees.
- The proportion of the total workforce in each business enrolled in the training also varied greatly. The greater the proportion of the workforce at a specific site, the easier to detect business-level effects. At sites where it was quite small, it reduced the ability to detect business-level effects at these sites. On average, participants represented 4.2 per cent of a business's overall workforce, with the proportion being twice as high in Nova Scotia as in Manitoba. The proportion participating ranged from less than 1 per cent in three large Manitoba-based businesses to over 30 per cent at one site in Nova Scotia.

### *Demographic Profile of Participants*

- Participants were quite similar to the broader workforce in the participating businesses, but there was a greater proportion of women, they were somewhat younger, and fewer had English as a Second Language (ESL). Comparing the *Measures of Success* sample to the broader workforce reveals a lower proportion of male participants and fewer people over the age of 40. Also, the proportion of participants who spoke English as their second language at home (ESL) was lower. Businesses differed across provinces in this respect: All ESL participants were in Manitoba. This created a challenge for both the ES training and the research that was not present in Nova Scotia.

### *Education Levels and Wages*

- There was wide variation in education levels and wages. The proportion of participants with a non-university credential was higher than the Canadian average, while the proportion with a university degree and the average wages were lower. While a larger percentage of participants had no education credential or only a high school diploma compared with working-aged Canadians overall, a higher percentage had some form of trade or vocational certificate. Manitoba participants had higher educational credentials and their average hourly salary was also higher, but the average hourly salary of all participants was \$18.34, lower than the Canadian average of \$22.72.

### *Job Stability and Positions*

- Participants were in fairly stable jobs – over 90 per cent in permanent positions and 96 per cent employed full-time. The average tenure was almost 10 years, and half the participants had been working for the business for at least five years. Stable, full-time employment supports persistence in training.
- Participants were employed in a wide range of positions. The positions were clearly aligned with the economic sector of their employer. There were case workers and counsellors from social services businesses and labourers, pipefitters, various production workers, lead hands and engineers from the other businesses, which were all in manufacturing. This suggests potentially wider applicability of the results.

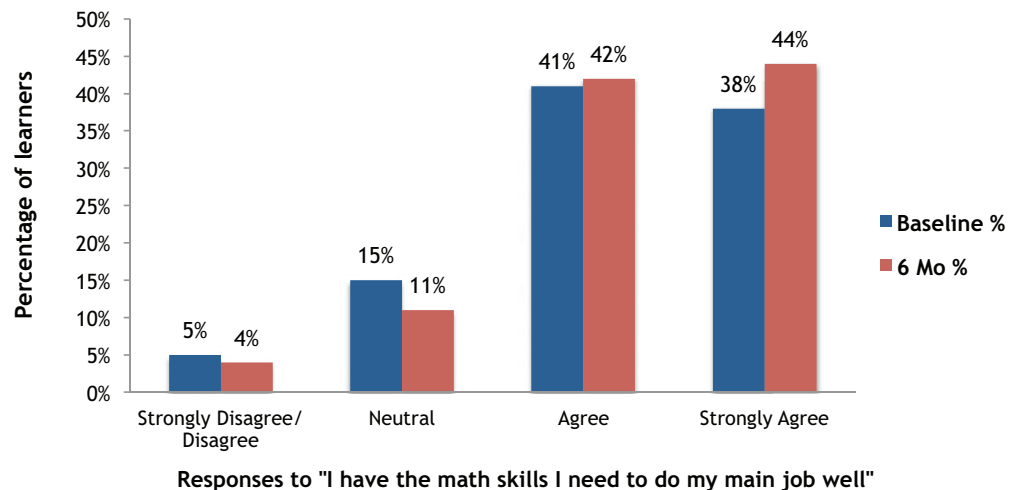
## 5. PROGRAM OUTCOMES

The *Measures of Success* evaluation design was effective in measuring longer-term post-training gains across a broad spectrum of outcomes including human capital, social capital, well-being, and a rich set of performance measures for participants and businesses.

There was a range of statistically significant improvements in outcomes related to **human capital** from baseline to 6-months post-training, including:

- Increased **confidence in work-relevant literacy skills** such as technical skills and math skills trainees needed to do their main job well (see Figure 2 below).

**Figure 2: Percentage of Participants with Confidence in Math Skills, at Work**

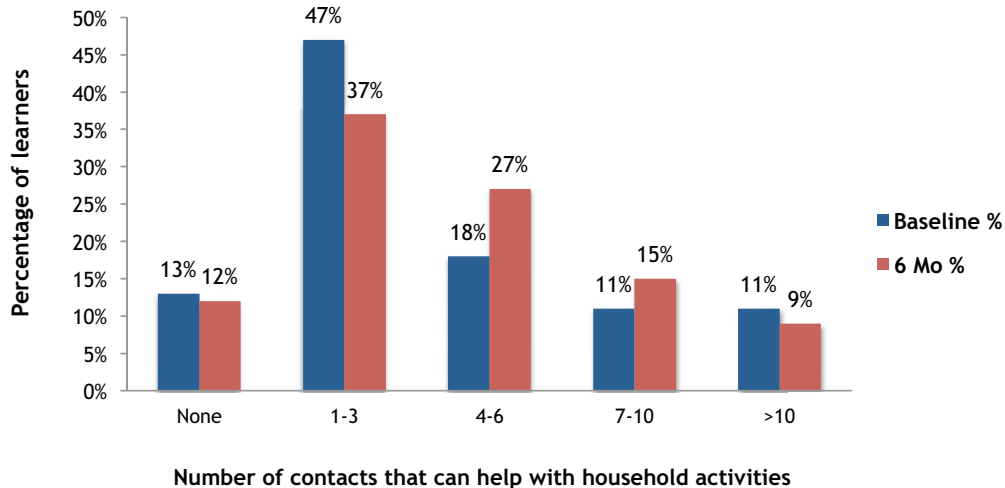


- Increased **confidence in everyday literacy skills** such as reading, writing, math, and computer use. Significant post-training changes in three math indicators included increased confidence in doing math, being good with figures and calculations, and reduced anxiety associated with figuring out amounts.
- Increased **practice of everyday literacy skills**, especially reading. Significant post-training increases were found in reading fiction and non-fiction, as well as visiting libraries and bookstores.

Beside direct gains in skills and practices, there was a variety of improvements in several mediating factors that may act indirectly to facilitate further skill development and longer-term performance improvement. They include:

- **Improved social capital**, such as network size and composition (see Figure 3 on page 9). Participants reported gains in network size and breadth and the types of support they could provide. A substantial number of participants went from closed, completely interconnected networks, to having less homogeneous networks, which are better for leveraging other kinds of resources and supports, including further learning opportunities.

**Figure 3: Number of Contacts that can help with household activities**



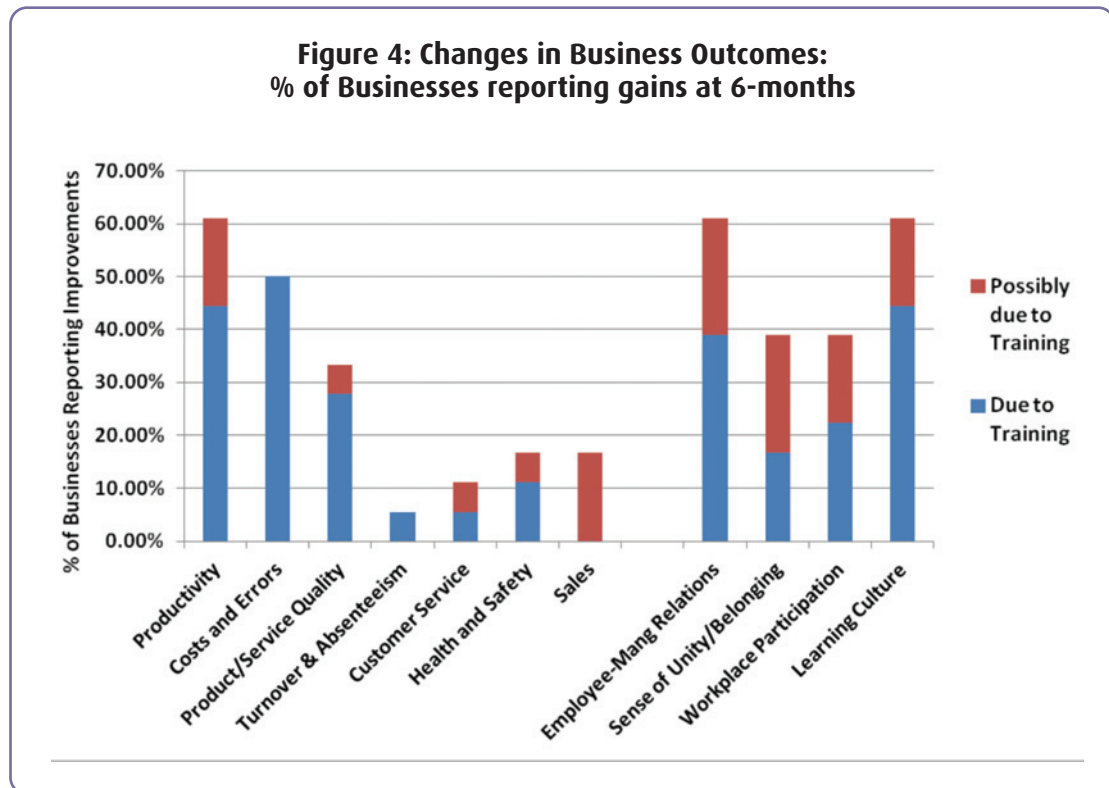
- **Enhanced cohesion**, such as increased trust. Participants' levels of trust in close connections such as neighbours, co-workers and supervisors remained high throughout the follow-up. However, post-training, they also broadened their spheres of trust to include more distant connections, as exemplified by increased levels of trust in total strangers. Enhanced trust with more distant connections may facilitate longer-term development and use of social networks.
- **Increased well-being**, including satisfaction with life and work. While gains in overall life satisfaction that were present at 3-months were no longer significant at 6-months, improvements in several indicators of job satisfaction were maintained 6-months post-training. These included reduction in job anxiety, improvement in the ability to balance the demands of work and family, and increased satisfaction with the overall quality of working life.

Improvements in eleven different **job performance indicators** were reported by participants. As well, a majority of firms reported a number of business outcomes explicitly linked to training.

- **Productivity gains** included things such as completing tasks more accurately with fewer errors, planning time more effectively, and using workplace documents and equipment more effectively. **Improvements in interpersonal relations** included better communication with co-workers and customers, and ability to respond to customer questions and concerns. Depending on the indicator, between 50% and 75% of participants agreed or strongly agreed that they had improved over the past 6-months; of those that reported improvement, about three-quarters attributed at least some of the improvement to training.

## 5. PROGRAM OUTCOMES - CONT'D

- **Businesses reported training-related improvements** in a variety of areas including both tangible and intangible outcomes. At least half of participating employers reported training-related improvements in *productivity, employee-management relations, learning culture, and costs and errors*. (See Figure 4 below)



Though there were substantial changes across a broad spectrum of outcomes, there were some for which no change was observed, contrary to expectations. These include:

- No gains in **practice of work-relevant literacy skills**. The lack of improvement in these measures was likely related to data quality issues. The measures assessed only changes in task frequency without taking into account complexity or efficiency.
- No gains in **psychological capital**, including motivation and engagement at work and attitudes towards continuous learning. Rather than simply being factors that mediate gains in other skills, these measures may represent a unique set of non-cognitive skills in their own right, that may need to be explicitly targeted by training in order to see improvement.
- No gains in indicators of **social inclusion**, including formal and informal volunteering, and participation in groups, organizations, and workplace committees. The lack of improvement in at least some of these indicators was likely related to data quality issues, especially very low response rates on specific questions.
- No gains in **earnings**. Six months is likely too short a time frame to capture significant changes in earnings. In addition, earnings data were compromised by very low response rates.

## 6. ANALYSIS OF FINDINGS

Analysis of *Measures of Success* findings suggests that workplace LES training may work for categories of people that are often thought to benefit less from training. For instance, post-training gains were common among a wide range of learners, including those with lower education, immigrants with English as a second language, and older workers.

- **Lower levels of educational attainment:** For the majority of outcomes in which improvements were seen in the sample as a whole, participants with high school or less were as likely to show post-training gains or to report improvements in job performance as those with college or university credentials.
- **Immigrants who commonly use languages other than English at home:** For the majority of outcomes in which improvements were seen in the sample as a whole, immigrants who likely used English as a second language (ESL) were as likely as Canadian-born participants to show post-training gains. In fact, ESL participants were **more likely** than others with similar characteristics to report improvements in a number of job performance areas.
- **Older workers** (age 45+) were as likely as younger and prime-aged workers to show post-training gains or to report improvements in job performance.

The results of the study suggest that a number of important implementation and contextual factors can influence the effectiveness of workplace LES training.

While further research is needed to explore the reasons and confirm the relevance of these findings to different populations (i.e. varying outcomes by firm size and sector), many of the findings confirm hypotheses and expectations regarding effective training delivery.

- **Business Alignment:** A broader range of improvements in job performance were reported by trainees from firms where there was a higher degree of *alignment between training and business needs*.
- **Dosage of training:** A broader range of improvements in participant outcomes – including post-training skill gains, skill practices, and improvements in job performance – were observed among those who *received more hours of training*.
- **Pre-existing training resources:** A broader range of improvements in job performance, as well as better business outcomes, were reported by trainees and sponsors from firms that already had some pre-existing training resources at baseline.
- **Participants attitudes and goals for training:** A broader range of improvements in participant outcomes – including post-training skill gains and literacy practices – were observed among those who had more positive attitudes and more specific goals about how they would use the training they were about to receive.
- **Performance Incentives:** A broader range of improvements in participant outcomes – including post-training skill gains and skill practices – were observed among trainees from firms that offered performance incentives.
- **Flexibility, Work-Life Balance:** A broader range of improvements in job performance were reported by trainees who at baseline had had more employer-provided facilities and flexibility to allow them to balance work with family life.
- **Size and Sector:** A broader range of improvements in job performance were reported by trainees from large (500+ employees) firms and from trainees in the service sector than in manufacturing.

## 7. THE EVALUATION MODEL AND ITS MEASURES

The Evaluation Model was reasonably successful at illustrating a link between LES training and outcomes by providing multiple lines of rich evidence, even though this design cannot achieve precise impact estimates.

The comprehensive nature of the evaluation framework and its measures allowed for multiple lines of evidence to help demonstrate a link to training. Among other factors, this included an analysis of participant characteristics, firm context, mediating conditions, and implementation and training delivery. In addition, the inclusion of questions that implicitly aim to establish attribution to training proved useful.

- **Multivariate explanatory analysis** of implementation factors such as business alignment and training dosage, as well as a range of mediating and contextual factors reveals multiple links between training and improved participant and business outcomes.
- **Inter-firm comparisons** also reveal a pattern of post-training outcomes that are largely consistent with theory and expectations, such that gains are more likely for those firms that had relatively advantageous implementation conditions and the presence of favourable contextual and mediating factors.
- **Participant attribution:** A sizable majority (about three-quarters) of participants who reported improvement in various job performance indicators attributed at least some of these improvements to training.
- **Business attribution:** More than 60% of improvements reported by firms in various business outcomes were attributed by employers to the training initiative. If outcomes that were judged to have been “possibly” improved by training are counted, improvements attributed to training rise to more than 90% of all improvements.

The study produced a series of recommendations for improving outcome measurement and streamlining instruments in a way that can increase their reliability and better address operational challenges of data collection.

An assessment of data quality in the current study has led to improvements to the measures and instruments including additions, deletions, and edits to question items to increase their reliability. These recommendations were based on applying several criteria:

- **Response rate** - Did the measure have sufficiently high response rates at baseline and follow-up to allow for conclusions to be drawn about the target population?
- **Distributional properties** - Did the measure have sufficient variability in response at baseline to allow for possible changes in key outcomes to be captured at follow-up?
- **Utility** - Did the measure capture statistically significant changes in key outcomes, and/or was it a key factor in explaining significant changes in other measures?
- **Conceptual relevance** - Is the measure conceptually relevant in relation to key constructs outlined in the research framework?

In addition, the development of a few new measures is encouraged, especially related to participant attribution of improvement to training. Emerging research is beginning to show that an effective way to ask participants about training impact is to pose the question in the form of an implicit counterfactual – e.g. how likely do you think it is that the reported improvement would have occurred if you hadn't taken the training? This kind of question encourages learners to take into account not only the impact of the course itself, but also the broader, longer-term influences training may have had on their own motivation and subsequent approaches to learning and problem solving.

These kinds of *implicit counterfactual measures* may be crucial to allow an examination of training impacts in the absence of a comparison group.

## IMPLICATIONS AND FUTURE DIRECTIONS

The *Measures of Success* project validates many of the beliefs that program managers and instructors involved in workplace LES training have held for a long time: LES training can be effective in producing performance gains in businesses and improving the quality of life of trainees. Beyond this validation, it appears that LES training can be effective for categories of employees who are often thought to benefit less from training, such as older workers and those who with lower education.

In addition, the rich and complex theory of change that the *Measures of Success* project developed to account for performances and confidence gains experienced by workers proved to be useful. Initially the *Measures of Success* researchers chose not to exclude issues and factors that could shed light on the outcomes of interest. While this complexity demanded more time from participants and businesses than anticipated, the findings showed that some questions yielded few results while others could be collapsed to get better precision. It became clear that it is possible to streamline the evaluation process and the data collection instruments. Some of this work has already happened in the revised instruments that are included in the appendices of the *Measures of Success* final report. The project partners believe that the evaluation framework and the instruments can be further improved, particularly if tested with a larger sample.

Weighing the relative importance of factors that contribute to performance gains is always difficult and the fact that the *Measures of Success* project had only 226 participants made it very challenging to identify the most critical factors. To push the limits and find out the extent to which the *Measures of Success* evaluation model and its instruments can be streamlined and made more user-friendly for program managers, instructors and businesses, we need to implement the *Measures of Success* model on a broader scale, testing hypotheses derived from this first attempt. Variations of the framework have also been used recently in some other large-scale projects in Canada, and the findings from those projects as they become available should enhance our understanding of the factors in LES workplace learning that will yield the greatest benefits for workers and businesses.

