Workplace Digital Essential Skills in Rural Small Businesses

Final Research Report

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May 2016

SRDC SRSA

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Published in 2016 by the Social Research and Demonstration Corporation

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Workplace Digital Essential Skills in Rural Small Businesses

Workplace Digital Essential Skills in Rural Small Businesses is a national pilot project that was administered by the Restigouche Canada Business Development Corporation (CBDC) from January 2012 to March 2016.

The original concept was to develop a flexible training model that would increase access to basic workplace digital skills training in small rural businesses that would be suitable for low literacy workers. Many employees with low literacy in small and medium-sized organizations in rural areas are known to lack digital skills and have little access to basic digital skills training that would allow them to fully participate in an increasingly technological economy. In response to this gap, Restigouche CBDC, in concert with a private learning software developer, created an online digital skills training platform. This is the product that was piloted and assessed in this project, with a view to wider distribution in the future. The purpose of this report is to present results of the analysis by the Social Research and Demonstration Corporation, which assesses the success of the implementation on a number of pre-determined indicators and describes the outcomes of participants and their employers.

The first chapter presents an overview of the project including the rationale, objectives, and target groups. The second chapter describes the training process, the research framework, and the accompanying data collection activities that support the evaluation of the implementation and outcomes of participants and employers. The third chapter provides a profile of participating workers and their organizations as well as a description of the training that was taken. Chapters 4 and Chapter 5 present the results of the analysis, relating to, respectively, the indicators of successful implementation followed by the outcomes of participants and employers along with an analysis of the factors that were found to contribute to these outcomes. The final chapter presents a concluding summary.

Chapter 1: Description of the project

Rationale and objective

The increasing need for digital skills to perform routine activities has caused a fundamental shift in the job tasks of workers, especially lower-literacy workers in smaller organizations, and notably, those in rural settings. These organizations face particular challenges in accessing the means to enhance their employees' digital skills. The overall objective of the Workplace Digital Essential Skills in Rural Small Businesses pilot project was to address this gap, specifically to develop, implement, evaluate and disseminate an online self-paced training model that would deliver digital skills training to employees with low or no digital skills in these types of rural small organizations.

The model was to have two main attributes: (1) be suitable, flexible and accessible for low-literacy workers in rural small businesses; and (2) be effective in addressing digital skills gaps and other associated needs of workers thereby contributing to improvements in job and organizational performance. The project, therefore, had essentially two main objectives, the attainment of which will define success:[1]

- **Implementation**: to develop a training product that is autonomous, self-paced, flexible and suitable for low digital skills and low literacy workers of rural small businesses. Here the concern is with the twin implementation issues of design and delivery.
- **Effectiveness**: to develop training that addresses basic workplace digital skills gaps of workers in rural small businesses. In seeking to address access and skills gaps of those with lower digital skills, the training was expected to improve their performance using digital tools and networks to perform workplace digital tasks and thereby enable their employers, in the **medium to longer run**, to keep up with changes in digital technologies and maintain or increase productivity, innovativeness and competiveness.

Definitions and target sample

The working definition of digital skills/competency that is used in this project is: "Workplace digital competencies (task-oriented, technical and cognitive) include [being able to use] digital technologies and communication tools and networks to acquire and evaluate information, communicate with others, and perform practical job related tasks in the workplace that enhance business success." (Modified from OECD's definition; cited in Satya Brink's comments, January 21, 2013).

[1] The research design has a related but separate set of objectives that are described in more detail in Chapter 2. Given constraints on the research design, sample size, and data collection timelines, only the implementation objectives can be evaluated with the intended scope. The effectiveness of the training is explored only through a description of the short-term outcomes of participants and employers following training.

The training that was developed and delivered in this project was designed to provide **basic** digital skills to employees with no or little digital skills and/or at lower-literacy levels to enable them to use the Information and Communication Technologies (ICTs) that will allow them to carry out their job-related tasks more efficiently and effectively. Basic digital skills enable one to use generic ICT tools and software to carry out job-related tasks (e.g., computers to search the Internet, conduct commercial transactions, and communicate with clients) at a basic enough level to perform in one's job. For this category, ICTs are **not** the main part of a job but a tool.

The target sample for this project was to be composed mainly of employees with low levels of literacy and/or with low digital skills and working in a variety of occupations in a variety of industries. For administrative purposes, employees for this project were selected on the basis of the following criteria:

- **Educational credentials**: workers who had less than a high school diploma (**or** who had an educational credential that was obtained before 2004, i.e., have been out of school since 2003 or earlier) – this criterion was used as a proxy for literacy level, i.e., to increase chances of selecting workers with low literacy skills as it has been established in past research (Green & Riddell, 2007) that those with lower education levels have lower literacy (the actual literacy levels of workers was later measured using the Canadian Adult Achievement Test); and
- **Job type**: year-round employees (not just seasonal) and those **not** working on a contractual, term basis – this criterion was used to ensure that participating employees would be available to participate in all of the pilot training program elements and research follow-up activities.

Partners

The Restigouche CBDC (Community Business Development Corporation) was mandated and funded by the Office of the Literacy and Essential Skills (OLES) at the then federal department Employment and Skills Development Canada (ESDC, now the Department of Employment, Workforce Development and Labour) to develop and implement the online digital skills training model through partnership with:

- local CBDCs (or provincial equivalent Community Futures organizations), which were responsible, under the oversight of a CBDC-designated **Guide**, for recruiting organizations in their catchment area and generally overseeing the project on the ground in their community;
- respective provincial governments responsible for training in the host province, which contributed financial and human resources to this project, including an **Instructor** from the provincial department handling workplace essential skills, whose responsibilities were to give guidance and assistance to the learners;
- Ellicom, an e-training developer, responsible for developing and implementing the online training platform; and
- Social Research and Demonstration Corporation (SRDC), a non-profit research organization, responsible for (1) providing support to CBDC Restigouche in the development of and recruitment for the training platform; (2) conducting the evaluation research for this project;

including the pre/post-training research surveys of employees and employers; (3) conducting the analysis of all data collected with the research and platform surveys and tests; and (4) reporting of the analysis results, the product of which is this report.

Digital skills

An early step in this project was to identify, using Essential Skills Profiles,[2] a manageable number of workplace tasks of a literacy complexity level of 1 or 2 from a variety of occupations from three large occupational categories (Administration, Production, Client Services) that could be performed better using digital technologies. From this inventory, eight digital tasks were identified as having significant digital content matching fairly well digital tasks identified in the literature[3] as covering the range of such basic digital skills tasks performed in workplaces. Further, this eight-task construct was presented in an Organizational Needs Assessment (referred to as the Pre-ONA) survey/consultation conducted by SRDC with participating employers in the summer of 2013 to confirm the identified occupations and tasks as those present in their workplaces and that they were experiencing digital skills gaps in them. Indeed, participating employers were.

The original eight digital skills/tasks were as follows:

1. Consult/read documents on the Internet or by using other digital media
2. Use documents and databases on the Internet or by using other digital media
3. Fill out forms on the Internet or by using other digital media
4. Perform online commercial transactions
5. Search databases on the Internet or other digital media to find useful information
6. Seek, find and choose information on the Internet
7. Use a calendar to schedule activities on the Web or other digital media
8. Communicate electronically with co-workers, suppliers and clients (to coordinate workplace activities, among other things).

However, it was later determined that there was overlap among some of these tasks, for example between consulting/reading digital information (Task 1) and using digital information (Task 2). Combining closely-related tasks was seen as increasing the cohesion of learning capsules and facilitating the integration of learning content, while also reducing duplication between learning capsules. This was further seen as reducing the number of workplace documents needed to contextualize the learning program to the workplace and as increasing the relevance of the training.

2 See: federal government: http://www.esdc.gc.ca/en/essential_skills/profiles/index.page

3 (particularly WDM-Consultant report *Defining Essential Digital Skills in the Canadian Workplace: Final Report*) and by Satya Brink (commissioned as an expert advisor during the initial phase of the project).

This consideration resulted in the consolidation of the original eight tasks into **five** digital tasks for which training content would be produced in this project, as follows, with rising level of complexity:

1. **Communicate electronically (by email) with co-workers, suppliers or clients to coordinate workplace activities (former Task 8)**
2. **Consult/read and Use digital documents on the Internet or by accessing databases (combining former Tasks 1 and 2)**
3. **Fill out digital forms and do commercial transactions on the Internet (combining former Tasks 3 and 4)**
4. **Use new digital technologies to access workplace coordination, collaboration and training tools (former Task 7)**
5. **Search, select and save useful information by using the Internet in a workplace problem-solving context (combining former Tasks 5 and 6).**

Moreover, a sixth skill/task was identified as missing from the original construct owing to the importance of security in information technologies: **6. Know, understand and apply security measures in a digital environment.** As the WDM-Consultant Report cited above identified numerous security measures judged important by employers when their workers use digital technologies. Thus, training content for this skill was embedded in the each of the digital training workshops corresponding to the five basic digital tasks identified above.

Targeted sectors and occupations

The sectors targeted in this pilot project were manufacturing and services. The targeted occupational areas were the following:

- **Administration**: examples include general office clerks, administrative clerks, accounting and related clerks, and purchasing and inventory clerks;
- **Operations**: examples include cleaners, janitors, housekeepers, homemakers and material handlers;
- **Production**: examples include machine operators, assemblers/fabricators/finishers, and inspectors/testers; and
- **Client service**: examples include customer service clerks, receptionists and switchboard operators, and client service assistants.

Chapter 2: Process, model, and research methodology

This chapter describes the process of recruitment, training delivery, and the research methodology and framework. At each stage, we also describe the data collection activities that generated the measures used in the analysis to assess the implementation and outcomes of participants and their employers.

Business recruitment

In collaboration with Restigouche CBDC, CBDCs in the respective communities recruited 10 small businesses initially between January and April 2013. Employers in the manufacturing industry in particular, as well as other industries, that were experiencing digital skills gaps were encouraged to participate in the digital skills training project not just for the immediate gains they individually would realize from the training, but also for the longer term benefit to the wider economy by contributing to a project that would demonstrate the effectiveness of such training. Businesses had to complete and sign the project's Business Participation Form which provided contact information, details that would help profile their business and confirmed their acceptance of various responsibilities regarding their participation in the project. A key recruitment criteria was to ensure the presence in the employee sample of a portion of low-literacy workers to ensure the project could identify if the workplace digital skills training was suitable for this group.

Organizational Needs Assessment[4] (ONA)

The ONA survey was administered by SRDC to participating businesses during the spring and summer of 2013. This survey had two objectives:

1. to determine if the training being developed would address their needs, and
2. to profile the digital skills needs of the business and its eligible employees in order to inform the design of the training program and ensure its alignment with business needs.

The 10 businesses that were initially recruited confirmed the presence of digital skills training needs at various levels for all of the eight digital tasks proposed for the digital skills training program. The Workplace Digital Skills training program therefore was developed for these eight digital tasks, which were eventually streamlined to five digital tasks and would become the focus of each of five training workshops in the program.

Workplace piloting process

The piloting of the digital skills training program in the workplaces of participating companies was done in three phases. The piloting was an intrinsic part of the project's research program and also

[4] Called Pre-ONA in this project.

part of the product development process of the training. The piloting process was conducted in three phases:

A. **Pre-Training Activities**, which took place over two time periods: January to March 2013 and September to December 2015

B. **Training**, which took place from September to December 2015

C. **Post-Training Activities**, which took place from September to December 2015.

Each phase is described below.

A. Pre-Training Activities

In each organization that agreed to participate, the Guide worked with the manager/owner to recruit employees to participate in the training. Employers completed and signed a research data release (consent) form and compiled and provided a list of prospective employees who met the criteria provided above. The original set of Pre-Training Activities comprised the following:

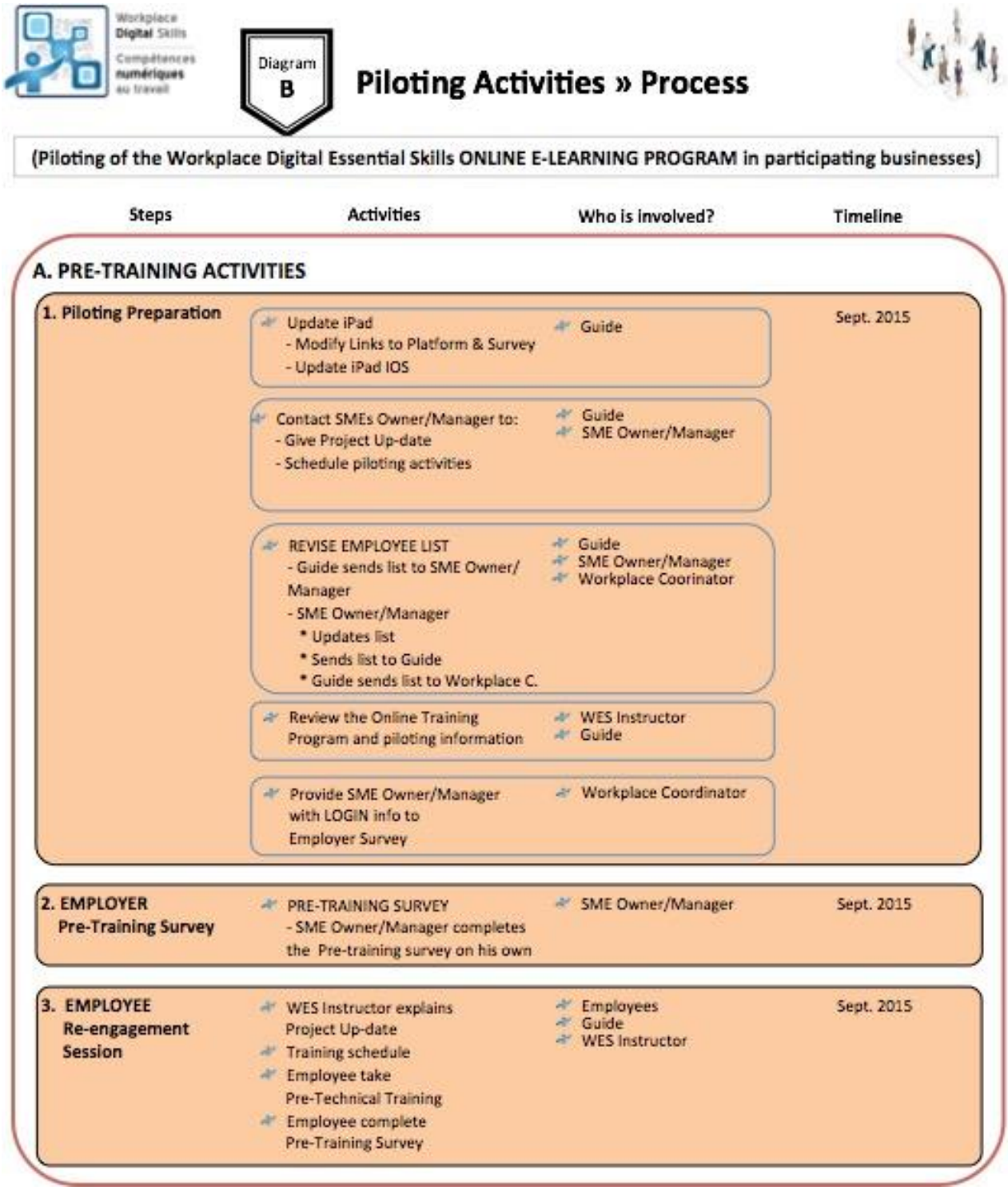
1. SME Briefing Session
2. Employee Briefing Session
3. Canadian Adult Achievement Test (CAAT)
4. Pre-Technical Training
5. Pre-Training Employee and Employer Surveys

Between January and March 2014, activities 1 to 5 were administered in all participating businesses. The Guides and Instructors organized the employer and employees briefing sessions (activities 1 and 2) to adequately inform participants about the project and the piloting activities and to schedule those activities. They also oversaw the completion of the **Canadian Adult Achievement Test (CAAT)** by participants (activity 3) to determine the level of literacy skills (lower than Level 2, Level 2, or higher than Level 2) of participating employees. Then, the Instructor and/or Guide provided/delivered the **pre-technical training** (activity 4) to employees to ensure they were able to easily access the online platform and participate in the training using an iPad Mini. The latter was the digital tool selected for participation in the training and was used to ensure maximum mobility of the training. At the same time, the Guide oversaw the completion of the online **pre-training employee survey**. Then the business owner/manager was invited to complete the online **employer pre-training survey** on his/her own. Note that these Pre-Training Surveys served to gather data for purposes only of the pilot (i.e., for research purposes only) and will not be part of the full production version of the training model.

At this point (spring 2014), the piloting paused owing to platform-development problems. In the fall of 2015, the online Workplace Digital Skills platform and training program were ready for piloting and the project team undertook a series of pilot preparation activities, many of which were repeats of the activities undertaken in the spring of 2014, as illustrated in Figure 1. The Guide led the re-engagement of employers for the pilot in his or her respective community. As indicated in the

first panel of the figure, this consisted of giving a project update to the business owner/manager, scheduling piloting activities, and revising the employee trainee list which, once updated by the owner/manager, was sent to the designated workplace coordinator. Since 18 months had passed since the last piloting activities, SRDC determined that it would be necessary to conduct more recent employee and employer pre-training surveys. Business owners/managers were sent their login information for the online pre-training employer survey, which they completed on their own (second panel of Figure 1). Panel 3 of the figure indicates the Instructor provided a project update to employees, thus re-engaging them in the piloting activities, and they then completed their pre-training technical training and pre-training survey questionnaire.

Figure 1 Piloting – Pre-Training Activities



B. Training/Platform Activities

The Training/Platform Activities phase of the piloting activities, as illustrated in Figure 2, included the piloting of the two sections of the online Workplace Digital Skills Training Platform and Program:

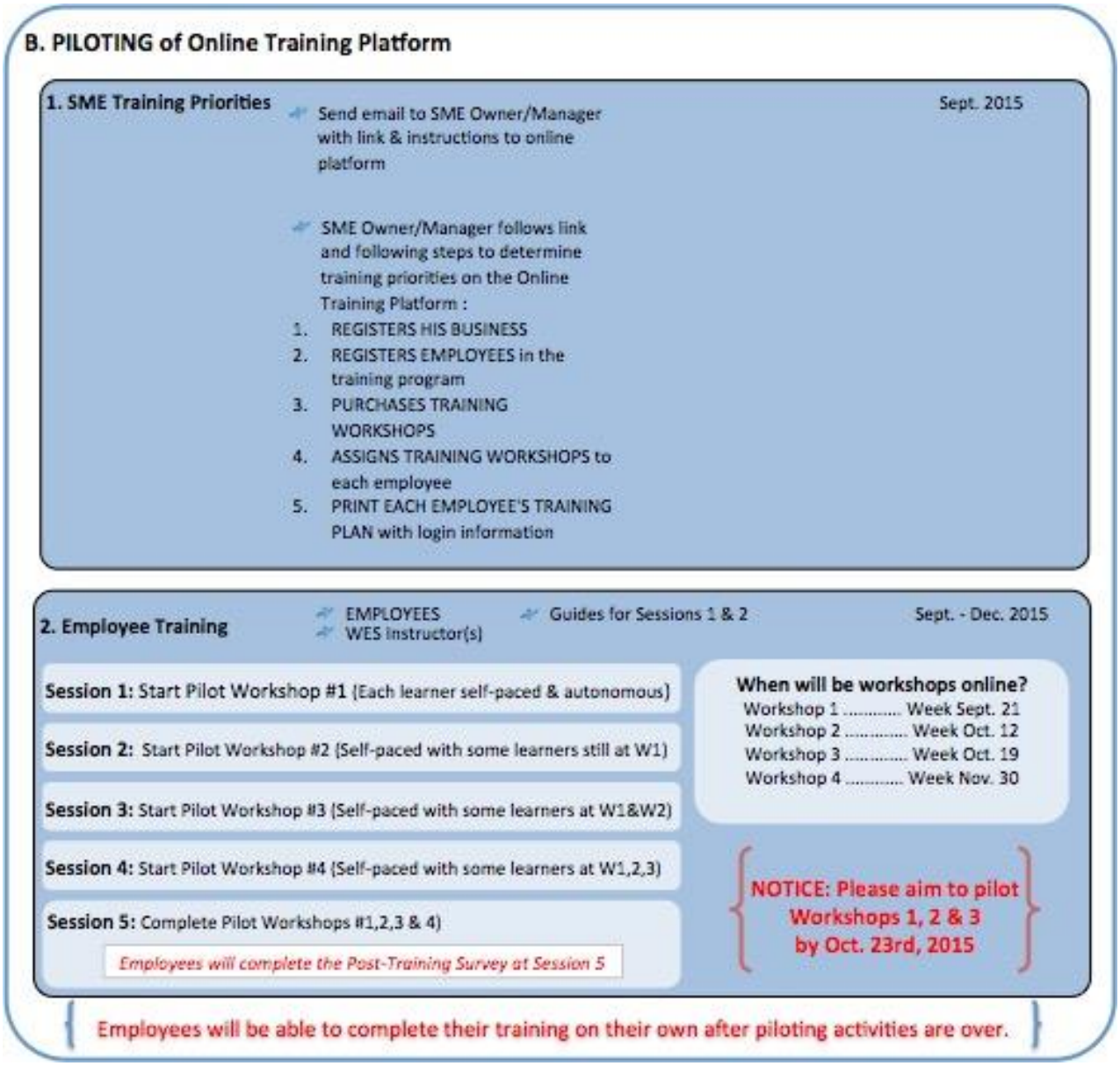
- **Manager Section** where the Employer Owner/Manager would login to the platform to manage the training program for his/her business/organization
- **Learner Section** where the employees would access and participate in the digital skills training program assigned to each of them by the business owner/manager.

Manager Section

The training model was designed so that business owners/managers could identify (and address) their businesses' Training Priorities by choosing, from amongst the proposed five (5) training workshops, the ones that their individual employees need to perform their digital workplace tasks. It was in the Manager Section (see the Training Priorities panel of Figure 2) where this took place, along with activities related to registration and to workshop purchase/assignment. Note that in the pilot most business owners/managers of participating businesses completed this step **autonomously**, i.e., without or with minimal help from the project's staff, Guides or Instructors.

The project's workplace coordinator first supplied the owner/manager with a link to the platform and instructions on how to use it. The owner/manager then followed the link to register his or her organization and employees for the platform. The owner/manager provided for the organization such information as its contact details, sector, size, language, and the name and contact information of its designated workplace coordinator. For each participating employee, the employer provided information on his or her occupational group and job title, along with a list of workshops the employer felt the employee should take based on perceived digital skills needs. The owner/manager then purchased the appropriate workshops; assigned them to the respective employees; printed the list of workshops for each participating employee, known as the Personalized Learning Plan; and sent each employee his or her plan.

Figure 2 Piloting – Training/Platform Activities



It should be pointed out that owners/managers, following registration of their organizations, had access to the platform for three main purposes: Management of Learners, setting Training Priorities, and Reports.

- First, in regard to **Management of Learners**, owners/managers were able to register new learners from among their employees, edit the learner login information, and print the learner Personalized Learner Plan including login information and the workshops assigned to each learner.

- Second, in regard to **Training Priorities**, owners/managers were able purchase workshops for their employees and assign those workshops to the respective learner which would become part of the Personalized Learning Plan of each employee.
- Third, in regard to **Reports**, the owner/manager could produce Organization Reports showing the progress of their participating employees, in order to monitor progress and observe final results in regard to the number of their employees who completed each type of workshop. In the Skills Gains Map section, the employer owner/manager could view the Skills Gains Map of each employee showing their personal skills gains (pre-test and post-test scores) for each workshop they took.

Learner Section

Designated employees began their training using their personal login information to access the Learner Section of the online Workplace Digital Skills training platform (see the second panel of Figure 2). A learner could participate in up to five workshops[5] (based on his or her Personalized Learning Plan). The Learner Section was designed so learners with low digital skills (and low literacy skills) could participate in the training autonomously in a self-paced fashion. Here we describe two important aspects of the Learner Section: the navigation interface and the learner path, both global and individual. Note that, as with the employers, in this pilot, participating employees were **not** provided with an instruction manual or video to show them how to proceed through the model. The only instructions provided to participants employees at the first piloting session when they received their printed Personalized Learning Plan along with their login information and the list of workshops to be completed were instructions from the Instructor to access the login page with the iPad, and instructions to enter their login information and to login the Learner section of the platform.

Navigation Interface

Once a learner logged-in, he/she was welcomed with two simple navigation tabs:

- **Current Tab**: When the learner logged-in, the platform brought the learner to the Current Tab where he or she was presented with the learning activity that he/she was to complete as per his/her Personalized Learning Plan. Once the learner completed a learning activity, the next learning activity he or she was to complete was presented in the Current Tab. Note that the learner path was partially automated to facilitate navigation for those low digital skills and especially low-literacy workers**.**
- **Progression Tab**: Once the learner completed a learning or assessment activity or capsule of a workshop, this activity was placed by the platform in the Progression Tab. All completed

[5] Note again that, while five workshops of training were produced, given time constraints on the pilot, research data were collected and analyzed only for the first three of them, namely: communicating electronically (by email) with co-workers, suppliers or clients to coordinate workplace activities; consulting/reading and using digital documents on the Internet or by accessing databases; and filling out digital forms and completing commercial transactions on the Internet.

learning activities were stored in the Progression Tab and could be accessed by the learner anytime for revision purposes.

Learner Path

Globally, the learner path was as follows. The Learner Section enabled the learner to take charge of her or his path. In the Current Tab, the learner was presented with the learning activity he or she had to complete in order to progress in his or her Personalized Learning Plan. Each of the five workshops had the same three-step structure. The learner had to successfully complete step 1 before moving to step 2, which he or she had to complete before moving on to step 3. After step 3, the learner had to successfully complete the End-of-Workshop Test (Summative) to receive his or her certificate of completion. Then, the learner was presented with the first step of the next workshop, inviting the learner to continue progressing in her or his Personalized Learning Plan.

With respect to individual learning paths, the subcomponents of each workshop are as follows:

- **Pre-tests:** for each step of each workshop, there was a **self-evaluation (SE)** and a **prior learning assessment (PLA)**. First, a participant took the self-evaluation, by responding to questions in which he or she was asked to evaluate (i.e., self-report) their digital capacity and abilities. If the participant scored less than 100% on the self-evaluation, he or she was directed to the training capsules. However, if the learner scored 100% on the self-evaluation, he or she was directed to the PLA, where his or her knowledge/skills were objectively assessed, based on contextualized learning situations that were intended to demonstrate or corroborate a participant's mastery of the learning objectives for that step.[6] If the participant scored 100% in the PLA of a learning step, he or she was assumed to have all the knowledge/skills being taught in, and was deemed not in need of, the training for this step. The Learner is then directed to the following step within the particular workshop. If the participant scored less than 100% on the PLA, he or she was directed to the training for that step.
- **Training:** There was first an overall Introduction stage of the training where participants were familiarized with the goals and mechanics of the training being delivered. Each of the five workshops consisted of three steps of learning with rising levels of complexity. Each step had on average six learning capsules, of which one was training, and each was of duration of between two and five minutes. If a participant completed a learning step in 20-25 minutes, up to six minutes was spent on training. The training content was contextualized to supply-chain

[6] This design feature of the pre-training skills assessments – where objective PLAs are administered to only participants who scored less than 100 per cent on the self-evaluation – introduces a serious constraint on the research design in that it is not possible to construct a consistent objective measure of *changes* in digital skills before and after training. Only a very small percentage of participants scored 100 per cent on the self-evaluation and were therefore administered the objective PLA prior to training. As a result, researchers needed to make use of the self-evaluation as the pre-training digital skill measure for the large majority of the sample, which is not consistent with the post-training objective skills measure, which was the post-training equivalent of the pre-training PLA. The objective PLA should be administered to all participants prior training in future implementations of this program, if consistent objective measurement of changes in digital skills is a priority.

occupations in manufacturing but was developed to be generic enough for those in other sectors. Learners in the various occupations had the same basic curriculum, but, in some workshops, were able to choose the context of the training exercises to reflect their particular occupation.

- **Post-test:** At the end of each step, there was a post-test consisting of a contextualized learning situation (or a "challenge") that served to demonstrate whether or not the participant had mastered the compulsory learning objectives of that step. If the participant scored 80% or greater on the post-test, then she or he received a **success badge** and proceeded to the next step (see immediately below). However, if the participant scored less than 80%, he or she could re-do the training for that learning step and take the post-test again, noting that the learner must pass the post-test in order to continue the training. Note that, as the questions in this post-test were the same as those on the pre-training test, a comparison of the results of both tests can provide a measure of skills gains for that step (see Chapter 5). Alternatively, when an objective pre-training PLA was not administered, the self-evaluation was used as the pre-training skills score. These skills gains results for all participating employees of a particular organization were exhibited in the **Skills Gains Map** in the Report Tab of the Manager Section of the platform where the owner/manager could view the progression of each employee.

After having successfully completed the three steps of a workshop, the learner had to pass the Workshop Assessment to receive the workshop certificate of completion.

- **Workshop assessment (or summative workshop test)**: After completing all three steps of a workshop, participants took a final online test that was an objective audit of the skills attained from all mandatory learning situations of the workshop. If the learner scored 80% or more on this test, he or she received a **workshop certificate** of completion indicating competency for the particular digital task of that workshop and then proceeded to a workshop feedback survey (see immediately below). However, if the learner scored less than 80% on the final assessment, he or she was permitted to make one or more attempts at it; in any situation, the participant was able to choose to re-take one or more of the learning steps of the workshop.

After completing the Workshop assessment, the learner was then presented with the **End-of-workshop survey.**

- **End-of-workshop survey**: as the final activity of each workshop, before a participant proceeded to the next one, he or she completed a short questionnaire capturing his or her perceptions of the user-friendliness, flexibility, suitability and autonomy of the learning situations and content of the training, among other issues. The end of workshop survey will be part of the full-production version of the platform and will assess of participants' perception of the training.

The workplace piloting of the Learner Section took place in group sessions facilitated by the Instructor and assisted by the Guide.

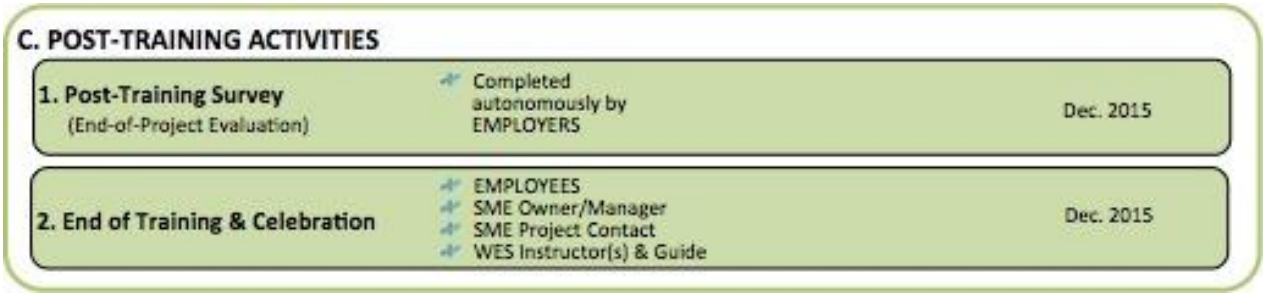
- **Testing Report:** At the end of each group session, Instructors completed the online Testing Report on employee assistance requests. During the course of the training, each time an employee asked for help from a Guide or Instructor – either with online platform navigation or

with content of various capsules – it was duly noted, along with the reasons and employees' recommendations for improvement, and the various notations were compiled in a report. These reports are part of the research tools. Considering that one key design feature of the online Workplace Digital Skills Platform and Program was that learners with low digital skills and low literacy skills could complete their training autonomously, these reports were very important not only to identify bugs but also to explain why employees could not be autonomous while participating in the training.

C. Post-Training Activities

At the very end of the training for the three pilot workshops, each owner/manager of the participating organizations and their employees participating in the training were asked to complete online research surveys. Specifically, employers completed the **post-training employer survey** on their own, while participating employees completed the **post-training employee survey** in a group session with the assistance of their Instructor/Guide (and possibly workplace coordinator). Again, these surveys were conducted as part of the pilot only and will not be part of the full production version of the platform. Figure 3 below illustrates the post-training activities, which also shows end of the training celebration which will now take place later in the spring of 2016.

Figure 3 Piloting – Post-Training Activities



Sample size

The online digital skills training was taken by **67 employees in nine rural businesses**,[7] one in each of Manitoba and Nova Scotia, two in each of Alberta and Quebec, and three in New Brunswick. Note that these numbers represent the maximum number of observations: as the reader will discover below, for a number of the datasets used in the analysis the number of observations was typically less owing to the fact that not all employers and employees typically participated in the survey or test in question, or the respondent may have chosen to leave a particular question item blank.

[7] Strictly speaking, these were not all businesses per se, as one of them was an extended care facility.

Note that the original expectation was that about 100 employees across 10 SMEs would be trained in this pilot project and indeed 102 employees in 10 manufacturing and service organizations were recruited by CBDC Restigouche in the fall of 2013. However, because of difficulties arising over the development of a training package, training development and delivery had to be delayed and recruitment started anew.

Research questions, data, evaluation framework, and methodology

Research questions

The research questions, corresponding to the project's main objectives laid out in the previous chapter, addressed in the evaluation conducted by SRDC are the following:

1. ***Implementation*: Was the training model designed and implemented successfully as intended?**
    - Was the model sufficiently **flexible** in terms of flexibility of access and options for customization?
    - Was the model **suitable** for low-literacy workers in a diverse range of occupations in rural organizations, in terms of its usability, content-accessibility and autonomy?
    - Were participants and employers **satisfied with other aspects** of the training model, such as the extent of support offered, or technical aspects of the platform?
2. ***Outcomes*: What were the outcomes of the training for low-literacy workers and the rural organizations they work for?**
    - Did participants experience improvements in their **digital skills** and other related outcomes such as confidence and use of information and communication technologies (ICTs) or attitudes to training and education?
    - Did the training model **assist organizations** in assessing and enhancing the digital skills of their employees? Did it help employers address their digital skills gaps and in turn did they experience any performance gains?
    - What **contextual factors** might influence these outcomes? Were there differences in outcomes based on the characteristics of workers, their jobs, or their employers and workplaces?

In addition, this research also sought to explore several traditional evaluation questions including:

- **Rationale**: Is there a demonstrated need for this program?
- **Program fidelity**: Was the program delivered as intended and did participants understand it?
- **Targeting and Generalizability**: Was the intended target reached? Can the product being evaluated be used in the broader economy?

Data

To address these questions, data were gathered by SRDC via surveys specifically for this evaluation research and by the training platform and Instructors by means of piloting tests and reports. Data from all these sources were merged by SRDC into a single dataset for purposes of analysis for this research, the results of which are presented in this report. The data sources and available sample sizes are provided below.

Employee-level data

The following are the sources of data that were available for participating employees. As noted, the model was developed to provide up to five workshops for each, corresponding to the five digital skills/tasks listed in the previous chapter (noting again that, for reasons of timing, the analysis is based only on participants of the first three workshops of the pilot):

- **Administrative reports** ("Platform/admin data"): date of initial login to the training program, occupation, training language, gender, age group, education level (n=67)
- **Literacy Level**: literacy level for most participants as measured in the initial Canadian Adult Achievement Test (CAAT[8]), (n=48)
- **Score Results** ("Scores"): for each of the three steps of each workshop completed (n=63), the scores include results from the:
    - Self-Evaluation: results/scores from participants' pre-training self-assessment of their digital skills that are the focus of the particular learning step
    - Prior-Learning Assessment (PLA): scores from the pre-training audit of participants' digital knowledge. Only participants who score 100% on the self-evaluation move on to this learning unit
    - Training/Learning: data on aspects of the training relating to participation and timing for the step; this shows a score of 100 if participants have gone through the learning
    - Post-Test: the results/scores of the post-training audit/assessment of the participant's knowledge of content taught in this step, with questions similar to those posed in the pre-test PLA
    - End-of-Workshop Test and End-of-Workshop Test 2nd Try: results of the tests of participants' acquired knowledge of the content in all steps of each workshop
    - End-of-Workshop Survey: results from questions on employees views of the user-friendliness and navigability of the training for each workshop, among other issues
    - Other administrative data: the number of times participants have accessed the step and the time spent in the Introduction capsule of the training

[8] The CAAT was used to the literacy level of participants as it was considered to be less costly and more easy to use than other literacy tests.

- **Self-evaluation results**: containing the detailed breakdown from the Self-Evaluation
- **End-of-Workshop Survey**: containing the detailed results for End-of-Workshop Survey on employee qualitative views on the platform's user-friendliness and navigability, among other things (n=43)
- **Testing report**: completed and all responses compiled by Instructors each time an employee asked for help, either with online platform navigation (n=35) or with the content of capsules (n=36).

In addition, data was collected by SRDC through research surveys administered on the Fluid Surveys platform (which will not necessarily be part of the training platform in the full production version of this product):

- **Employee pre-training survey**: data on employee profile variables and the pre-training levels of a wide range of outcome variables in such areas as digital skills and information communications technology and a range of psychosocial and attitudinal outcomes (n=60)
- **Employee post-training survey**: data on qualitative implementation data, and the post-training levels of a wide range of outcome variables in such areas as digital skills and information communications technology and a range of psychosocial and attitudinal outcomes (n=54).

Employer-level data

At the employer level, there were data from following two surveys designed by SRDC and administered on the Fluid Surveys platform for research/evaluation purposes only (bearing in mind the small number of employers in this project limited analysis at this level):

- **Employer pre-training survey**: organization profile data and pre-training levels of outcome variables such as organizational performance (n=8)
- **Employer post-training survey:** data on post-training levels of outcome variables such as organizational performance, perceptions of the role of the DES training in various outcomes, and satisfaction with aspects of model and implementation, as well as data from a number of implementation questions that were originally to be part of an employer exit survey administered by CBDC Restigouche (n=7).

CBDC Restigouche provided data to SRDC from the multiple training-platform sources in Excel spreadsheet form. SRDC then cleaned these datasets and merged them, using a unique identifier, with the platform data and data from the pre/post employer and employee surveys into a single analysis dataset. Univariate frequency distributions were first produced for all implementation indicators and outcome variables. Then, for selected implementation indicators and outcomes, bivariate distributions were conducted in order observe patterns and identify contextual factors that were particularly beneficial or particularly in need of corrective attention.

It should be emphasized that there were a number of sources of data to measure skills gains. All tests and surveys were self-administered, but in some cases digital skills were **self-**

reported/assessed, while in other cases they were **assessed based on learning situations**. On the platform, there were, before and after the training, skills tests, which were self-administered by participants but were **objectively** scored by the online system. These pre-training scores were compared to post-training skills assessment scores based on learning situations in order to measure skills gains. However, as noted above, only a small percentage of participants completed objective PLAs before training. As a result, the measures of digital skills gains presented in this report needed to utilize the self-evaluation before training and are, therefore, implicitly reliant on self-assessments.

Evaluation framework

The framework to measure implementation success and outcomes of participants and employers was based in part on research designs from related studies of workplace literacy and essential skills training (see Gyarmati, Leckie, Dowie, Palameta, Hui, Dunn, & Hebert, 2014; Palameta, Gyarmati, Leckie, & Dowie, 2013; and Leckie, Gyarmati, Dowie, & Hebert, 2012). The evaluation framework is built on a theory of change for how the **implementation** of a workplace training intervention can produce specific **outcomes** for participants and employers and how various characteristics and **contextual factors** can influence this process of change. Indicators include both implementation and outcome measures, and the latter include not just the immediate outcomes of interest – such as digital skills gains – but also outcomes that can take longer to manifest themselves such as changes in attitudes towards education, and, in turn, might lead to further outcomes down the road such as career advancement. The next section elaborates on these important aspects of the framework: context, implementation and outcomes.

Context

Research has shown that it is not sufficient to simply measure the outcomes of training interventions but also to take into consideration the contextual variables as they typically can influence how effective the training is. Thus, results will be disaggregated by contextual variables (where sufficient sample size and variation exists). There are two main types of contextual variables.

First, **participant characteristics and workplace factors** can affect both implementation and outcomes. These variables include factors such as the participants' pre-training skills and education levels, ages, pre-training experience with and attitudes toward learning, psychological traits (e.g., confidence, self-efficacy), and their future orientation and degree of social interaction. Those with lower levels of skills and education might be expected to benefit more from the training, since there would be greater room for improvement. On the other hand, those with negative experiences with and attitudes towards education and training might be expected to not do as well as those with positive learning experiences if they are less likely to actively engaging in learning. Future orientation is another important variable to consider as implicit in the decision to train is that it is an investment in the future. Social interaction can influence training success as well, as interaction with co-workers during and after the training can reinforce and magnify what one learns from training. Similarly at the workplace level, one might expect that the size, sector, or organizational

structure could influence outcomes of training as these factors can mitigate the degree to which employers are engaged and how they utilize the outputs of training.

Second, **aspects of the training implementation** itself can also affect outcomes. These include variables such as the dosage or intensity of training (the number of hours of training taken); the amount taken autonomously; and the technical aspects of the training related to software and hardware, as well as the environment in which the training is taken. Another important aspect of the training to consider is the extent to which there is "intentionality" in the intervention, which refers to the degree to which employers and employees understand the goals of training, are clear in what they hope to attain from it, and are active participants in achieving those goals. While intentionality can be complex to measure, several strong indicators of it include participants' pre-training motivations and willingness to take the training (for example, whether or not it was mandatory or voluntary) their expectations for the training (how useful it would be), as well as their employers' degree of support for the training (are they actively encouraging its use, and is there a plan for its application). Those who have been forced or strongly encouraged to take the training counter to their intentions, might not do as well as those who are willing and active participants. Similarly, those who believe their employer supports them in the training and who have an active plan for its use in the workplace may more actively engage and apply their training.

Implementation and outcomes

First, there are several key indicators of a successful **implementation** that are fundamentally linked to the goals of the digital skills training model, which were envisioned in the project design. These include notions of *flexibility* in access and customization, its *suitability* of format and content for low literacy workers, and the degree of *autonomy* the training model affords in its use. Indicators of **flexibility** include those that measure the extent to which participants were able to access the platform when, where and how they wanted; and the degree to which participants could take the kind of training they wanted and whether employers had a degree of choice and flexibility in assigning workers and training content as needed. Indicators of **suitability** include those related to the degree of website navigability, and content suitability in regard to the clarity of the information and language. The degree of **autonomy** for participants relates to their ability to self-direct their use of the platform and training content.

Second, regarding participant and employer **outcomes**, the focus is not just on the immediate outcomes of interest – i.e., those relating to digital skills and information communications technologies – but also on potential **intermediate** outcomes of learning such as psychological and attitudinal outcomes that relate to longer-term outcomes of employability and enhanced productivity of workers. One important set of intermediate outcomes concerns general **learning attitudes**. The expectation is that training, even in small dosages, can lead to a greater appreciation for learning and its value to the individual's performance and success in the labour market, which in turn can lead to actual enrolment and engagement in further learning and skills development, leading to longer-term career advancement. Another set of intermediate outcomes includes those related to various **psychosocial measures** such as confidence and self-efficacy, self-esteem, persistence, future orientation, and social interaction and networks. Gains in these outcomes are not only linked with improvements in one's overall wellbeing but they are often also important

precursors to further labour market success including job stability, retention, and improved productivity in the longer term (Gyarmati et al., 2014 and 2011; Palameta et al., 2013).

The latter set of outcomes is in keeping with a longer term objective of the digital skills training in this project: to increase the performance and competitiveness of the participating organizations by enabling them to increase the digital skills of their employees. However, it should be noted that the degree to which outcomes would be observed at the employer level, and to some extent for participating employees, was limited by the relatively small amount of training delivered (dosage) in this project (a maximum of two hours of training, out of potential five hours accessing the platform including pre- and post-tests for each learning step and post-workshop test), the fairly short follow-up time frame, and the small number of participating workers (n=67) and, particularly, employers (n=9). Indeed, given the limited amount of training, where strong pre-post change is observed, in spite of these challenges, might suggest that the quality of training is high.

To measure the extent to which outcomes were attained in this project as per the research questions and project objectives, indicators or measures were derived based on the available data. A summary of the more detailed matrix linking the indicators to the research questions and to the data sources is presented in Appendix A.

Methodology

Ideally, to measure the effects of a training program, the post-training outcomes of participants and/or the changes they experience would be compared to the same set of measures for a similar group of who individuals had not received the training. Depending on how this "comparison group" is constructed, it can provide what is referred to as a "counterfactual" – an estimate of what would have happened to the training participants had they not participated in the intervention. If the two groups are statistically similar before training, one may be able to attribute observed differences between the groups over time to the training intervention. However, for this project, insufficient funding and sample size prevented the use of a comparison group design. Instead, the possible effects of training are explored through several methods, described below.

- **Pre/post-training comparisons:** Before and after the training, respondents were asked similar sets of questions related to the outcomes of interest, e.g., skills, ICT confidence, attitudes to education and training. The differences in responses before and after the training can be used to approximate the changes arising due to the training. However, this approach implies a "no-change" assumption – that is, it assumes that the outcomes would be the same before and after training had the intervention not been delivered. In other words, the analysis assumes that all of the changes participants experience are caused by the intervention. For most outcomes this is simply not a satisfactory assumption, as they generally do change over time without intervention. As a result, we caution the reader that the pre-post differences presented in this report represent changes and **not** necessarily the effects or impacts of the training.
- **Bivariate frequency distributions for subgroups:** In the original design of the project, there were to have been over 100 participants, which likely would have been enough for multivariate regression analysis whereby the outcomes of interest, such as skills gains, would have been "regressed" upon a set of explanatory and control variables that comprised the training itself

and a range of contextual factors. Regression analysis provides another method to control for differences that are unrelated to training in an attempt to isolate the possible effects of the intervention. However, because of the smaller than expected sample size, multivariate regression analysis could not be utilized with these data. Instead, we were limited to the analysis of bivariate frequency distributions to observe how indicators varied across particular subgroups of interest (such as initial skill level, gender, and sector) with no additional control variables. Furthermore, groups needed to be chosen on the basis of the available sample size and distribution of the outcomes, ensuring that there were sufficient numbers of observations. As a result, an analysis of subgroup differences was simply not possible in all circumstances given sample size restrictions.

- **Implicit counterfactual:** Another alternative to a comparison group design or multivariate regression analysis to control for changes unrelated to an intervention is the use of what is referred to as an implicit counterfactual. This approach involves asking each respondent to indicate the likelihood that the changes they experienced would have occurred without the training. The respondent's own assessment of that likelihood provides an "implicit" estimate of how much of the change is caused by the intervention. While this approach is certainly inferior to many comparison group designs, it has been shown in some studies to approximate the effects, as estimated from a counterfactual (Black & Smith, 2003). However, given time constraints on participant surveys, only a very limited number of outcomes can include follow-up questions to assess the implicit counterfactual. The results from these are reported in subsequent chapters when they have been included in the analysis.
- **Triangulation and preponderance of evidence:** In spite of the sample size constraints and the limitations of the above approaches, this study does employ a rich evaluation framework for assessing outcomes of training. This includes an underlying logic model, or theory of change, which articulates quite explicitly the kind of outcomes that would occur if the intervention was implemented successfully. It also include multiple measures and sources of confirmation. As a result, if the observed changes occur in a way that matches this theory, it provides a degree of confidence that the changes are indeed related to the intervention, even in the absence of a counterfactual. While this is not a substitute for a design using a counterfactual, it can provide the reader some additional confidence that the intervention has been a factor in generating the outcomes, given the "preponderance of evidence" that is present when a number of indicators are observed as excepted.

Data analysis

SAS (Statistical Analysis Software) was first used to generate univariate distributions of most variables and then to generate the bivariate distributions of the outcomes of interest by subgroups, where sufficient sample size permitted. Statistical tests were conducted on the differences in means and distributions of outcomes of interest at different points in time (pre- and post-training levels). Similarly, statistical tests of differences in outcomes between subgroups of interest were also conducted. The results of statistical testing are reported only when a difference was found to be statistically significant (with P-values of less 0.10).

The next chapter profiles the participating workers and organizations and a description of the training that was delivered in this project. The following two chapters present the results of the analysis of the implementation and outcomes of participants and employers, respectively.

Chapter 3: Profile of participants, organizations, and training provided

This chapter is concerned with profiling participating businesses, employees, and the training that was provided to participants. The profiles are based on administrative data from the platform, data from the pre-training research surveys of employees and employers as well as data from the pre-training platform tests/assessments.

In addition to profiling participants and the training provided, results in this chapter serve several purposes. First, they can be used to address evaluation issues other than the main ones concerned with the implementation and training outcomes addressed in the next two chapters.

- **Rationale**: whether or not there truly is a need for the program – by demonstrating the existence of an actual digital skills gap among participating employees and employers.
- **Program fidelity**: whether or not the program as delivered was true to its intent and the degree to which participants understood its purpose.
- **Target group**: whether the intended target group for the program was reached, mainly in regard to initial digital and literacy skills. Note that education level was used as a proxy for literacy level, as the latter could not be known at the time of recruitment, but was later measured using the Canadian Adult Achievement Test. This speaks to the recruitment and selection process, though it also should be pointed out that having participants with a range of literacy/digital skills enabled researchers to observe differences in results by literacy/digital skill level.

Second, among the profile variables are a number of key **contextual factors** that can affect the training (as described in the previous chapter as part of the evaluation framework). The results presented enable identification of those key variables where there is sufficient variation and sample size to facilitate **subgroup** analysis. The purpose is to identify particular groups or factors between which differences in training outcomes are more or less likely to occur (identifying relevant patterns). Also, by identifying subgroups between which there are **not** differential outcomes, e.g., between the manufacturing and service sectors, the analysis can to some extent also serve to demonstrate the program's applicability or generalizability (e.g., beyond the manufacturing sector to which the training was contextualized). Third, in many cases, the participant profile results presented in this chapter represent initial pre-training outcome levels of interest to which post-training levels were later compared in order to derive potential gains from the training. While Chapter 5 presents an analysis of these changes, this chapter provides the reader with a set of "**baseline**" outcomes of interest.

Main profile findings

Targeting/recruitment/selection

There is evidence that program administrators did reach, to a large extent, their intended targets. As intended, the sample was formed with a majority of employees (52%) having low literacy levels (level 2 and less than level 2). The fact that a large proportion (48%) had higher literacy level (more than level 2) enabled the researchers to compare the performance of low literacy employees with those with a higher literacy level and judge for what level of literacy the Workplace Digital Skills was most suitable. While large proportions of participating employees indeed reported DES and ICT gaps, there was a sizeable number as well who self-reported fairly high levels of DES/ICT proficiency, enabling the researchers to observe differences in outcomes by DES/ICT level. Furthermore, a large proportion of participants were in year-round, full-time jobs, thus ensuring those who were registered for the training would be available for training and testing during the pilot.

Rationale

The rationale for a DES training program was demonstrated. In developing the DES training platform and implementing this pilot to evaluate it, CBDC Restigouche held that small and medium-size organizations in rural settings have workforces that lack digital skills, which prevents the organizations and workers from fully taking advantage of digital technologies. The evidence gathered in this evaluation indicated that both participating employees and the small and medium-sized organizations that employ them were experiencing digital skills gaps before the training. A majority participating organizations reported that their employees were not proficient in digital tasks and information and communications technologies and that, moreover, they spent very little on digital skills training over the previous year. Similarly, large proportions of participating employers reported that their employees were not proficient in digital tasks. This would suggest that there was and is in fact a need for a program aimed at enhancing digital skills and that DES program fulfills this need.

Fidelity

Program fidelity was demonstrated in this evaluation. Most participating employees reported that they were in the program to enhance their digital skills, indicating they fully understood the purpose of the training and that those implementing the program adequately explained its purpose during the promotional and recruitment stage. Similarly, employers were supportive and optimistic about the training, indicating that they too were engaged in the process. This high degree of engagement can likely be attributed to how program administrators promoted it to potential participating employers and employees. These are good results in light of the fact that the piloting of the online training program was done in two time frames (winter 2013 and fall 2015) and with a 16-month separation between the two phases.

Engagement in the process

Employers' and employees' pre-training motivation and expectations for the training were high, suggesting a high degree of engagement in it, though with some provisos. An overwhelming majority of participants reported that their employer supported them in the training. Despite reporting low levels of digital skills and ICT proficiency among their employees, most employers were confident that the DES training would increase ICT markers relating to employee acceptance, comfort, proficiency, the amount of time to do tasks, and overall use. Large majorities of participants said they were looking forward to the training and were motivated to do their best in it. However, about two-thirds of participants were concerned about having to do the training on their own. Also, almost a third said they were required to take the digital skills training by their employer, while about a half said they were encouraged to take it.

Profile of participating employees

Data mainly from the pre-training employee survey but also other pre-training sources were analysed to profile participants in the DES training. In total, 60 employees participated in the pre-training survey, out of the 67 who participated in the training.

Demographics

A demographic profile of participants is as follows (see Table 1):

- **Sex**: Only about 40 per cent of participants are female (39%). This would suggest that men are somewhat overrepresented, compared to the sample of Canadian adults with lower literacy (latest results from the 2012 PIAAC show men and women have similar distributions of proficiency in literacy and PSE-TRE).[9]
- **Age**: Participants represent a fairly mature workforce. Just over 18% of participants are under 35 years of age while almost two-thirds (65%) are 45 years or older.
- **Marital status**: About two-thirds are married or in a common-law relationship.
- **Aboriginal status**: One in eight participants (12%) considered themselves an Aboriginal person, either First Nations, Metis, or Inuit.
- **Language spoken**: About a third of participants speak primarily French at home and about a quarter speak English. About 5% speak another language, while the rest were non-respondent to the question. As for language used primarily at work, participants are evenly split between French and English.
- **Immigrant status**: About 80% of participants were born in Canada. Another 13% were permanent residents (landed immigrants).

[9] Statistics Canada (2015).

- **Disability status**: About a fifth of participants reported that they have a physical or mental health condition that reduces the amount of kind of activity they can do at work.
- **Province**: Participants were from five provinces: Alberta (35.8%), Manitoba (6.0%), New Brunswick (28.4%), Quebec (25.4%), and Nova Scotia (4.5%).

Table 1 Demographic profile of participants

Characteristic	Incidence or Distribution (%)
Gender (n=67): Female	38.8
Age (n=66)	
34 years or younger	18.2
35-44 years	16.7
45-54 years	36.4
55 years plus	28.8
Marital status (n=60)	
Married/common law	68.3
Separated/divorced/widowed	6.7
Single, never married	25.0
Disability status: Has a physical/mental/health condition that reduces amount of activity done at work (n=59)	20.3
Aboriginal status: Is one of First Nations, Metis or Inuit (n=60)	11.7
Language:	
French spoken most often at home (n=60)	50.0
French spoken most often at work (n=60)	55.0
Immigrant status (n=60)	
Born in Canada	81.7
Permanent resident ("landed immigrant")	13.3
Not born in Canada or not a permanent resident	5.0

Characteristic	Incidence or Distribution (%)
Province (n=67)	
Alberta	35.8
Manitoba	6.0
New Brunswick	28.4
Quebec	25.4
Nova Scotia	4.5

Source: Platform data and pre-training employee survey.

Outcome indicators, pre-training levels

The results presented in this section are for variables many of which could change over the course of the training and serve as the baseline or pre-training levels of outcomes. Many of the results presented are based on questions in the research surveys asking respondents to indicate their level of agreement with certain statements capturing the concept of interest using a 5-point scale ranging from 1=disagree strongly, 2=disagree somewhat, 3=neutral, 4=agree somewhat, and 5=agree strongly. Typically the results are presented as the proportion **agreeing** with a statement, which comprises those who reported 4 (agree somewhat) and those who reported 5 (agree strongly). Another type of question was to rate something (such as an experience) on a 5-point scale, ranging from 1=very negative, 2= somewhat negative, 3=neutral, 4=somewhat positive, and 5=very positive. The proportion who said something was negative or positive is the proportion indicating 1 or 2 (very or somewhat negative), or 4 or 5 (somewhat or very positive), respectively.

The results are presented in three areas:

- **human capital:** literacy and educational credentials, education and training attitudes, digital essential skills (DES) and information and communications technology (ICT) proficiency;
- **employment conditions:** sector/occupation, type of job, benefits and learning supports; and
- **psychological aspects of the job and self:** quality of the job, psychological factors relating to the job, future orientation, and social interaction.

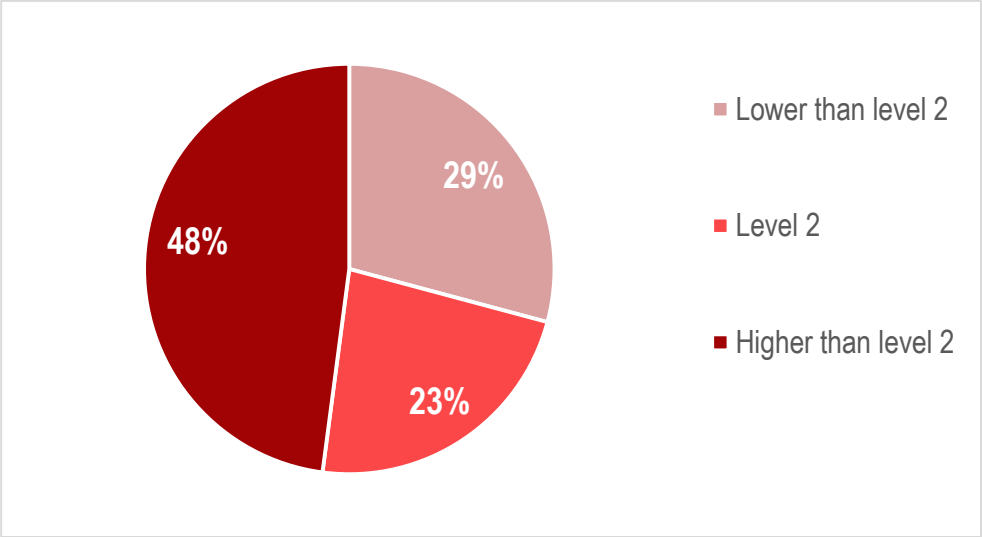
Human capital and ICT proficiency

Literacy and educational credentials

The program was targeted at those with low literacy, defined as those at literacy level 1 or 2. As Figure 4 indicates, over half (53%) were at literacy 2 or less, according to the Canadian Adult

Achievement Test administered just prior to the start of the training, indicating fairly low literacy, **in keeping with the focus of this program**.

Figure 4 Distribution of participants by literacy level

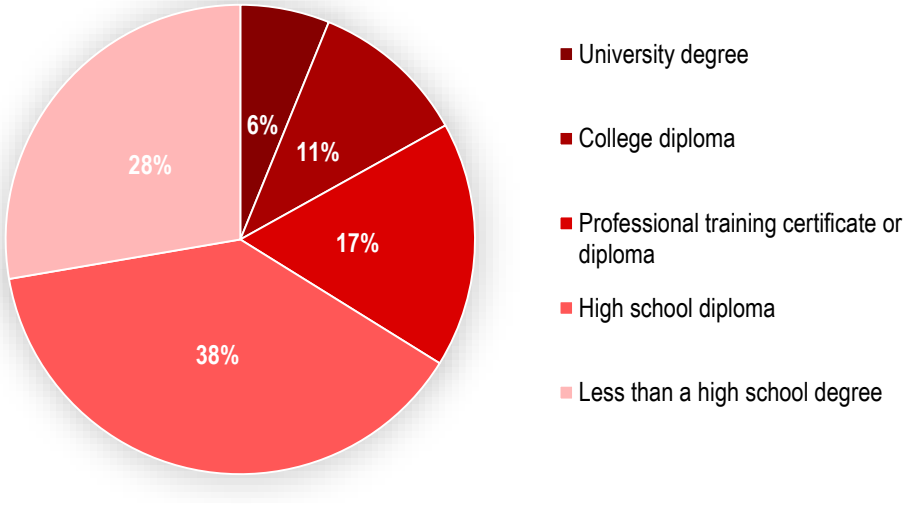


Source: Canadian Adult Achievement Test.

As low education level is typically associated with low literacy level,[10] to increase the chances of having employees in the training program who had low literacy, selection was focused on those with lower (recent) education qualifications, specifically those without a high school diploma, or "older" secondary and post-secondary credentials. As shown in Figure 5, the profile results indicate that 28% of participants had less than a high-school certificate. About a third of participants had attained some kind of post-secondary education, be it a professional diploma, a college diploma or a university degree; the rest has a high school diploma (39%), though when they attained these qualifications is not known when the educational credential was attained. Nevertheless, participants were less highly educated than the workforce at large, as the proportion without a secondary or post-secondary certificate is considerably higher than it is in the Canadian workforce (11%), suggesting low relative literacy among training participants.

10 Learning – Adult Literacy, http://well-being.esdc.gc.ca/misme-iowb/.3ndic.1t.4r@-eng.jsp?iid=31

Figure 5 Distribution of participants by educational credentials obtained



Source: Platform administrative data.

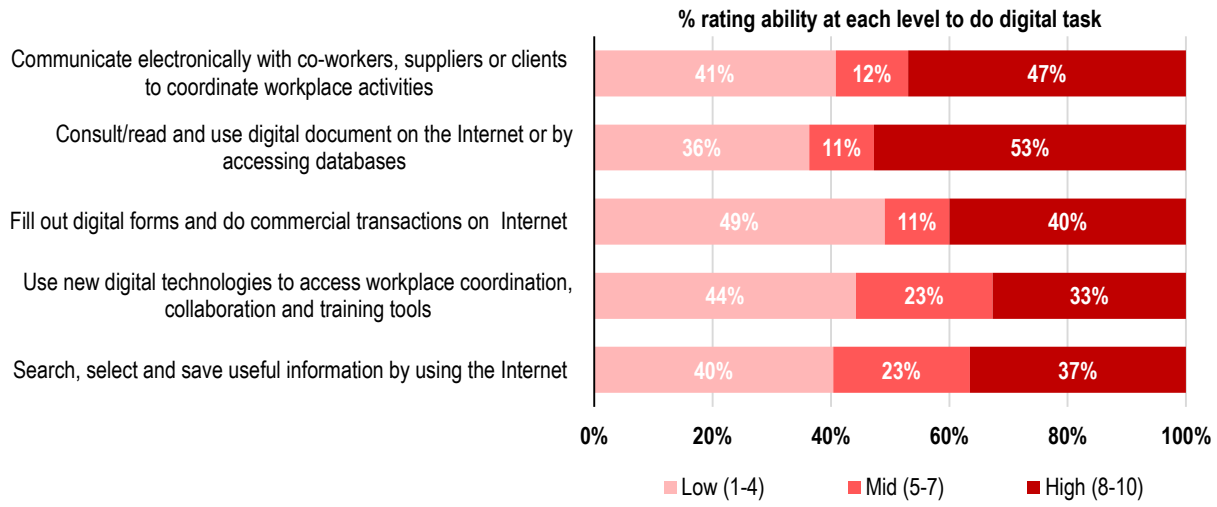
Education and training experience/attitude

Participants generally had positive prior experiences with education and appreciated the benefits of education and training. Those with negative experiences might be expected not engage less with the DES training compared to those with positive experiences. About three-quarters of participants had a somewhat or very positive experience with the education system. Similarly, they had a very positive attitude to training and education: the vast majority believe that learning increases chances of getting a better job (90%) and that learning increases confidence (97%). Less than a fifth (18%) said that getting education and training certificates requires too much effort.

Digital Essential Skills (DES)

Large proportions of participants had low levels of digital skills, though several were not basic DES levels. Results from the pre-training research survey (Figure 6) indicated that large percentages (36-49%) of participants had low levels of ability in the five digital skills of the training program. Also, as Figure 7 below indicates, just two in five participants (39%) felt that they had the digital skills to do their job well. On the other hand, large percentages rated their digital-skills highly on the scale (between 33-53%) for the five (5) digital tasks of the training program (Figure 6). As indicated above, the target of the program was employees with low digital skills. However, bear in mind that these are self-reported skill levels and it may well be that participants were exaggerating their skills and/or were not aware of their skill shortfalls. Also, employers reported digital skills gaps among its employees, as shown below in the Profile of Organizations.

Figure 6 Self-reported digital skills, baseline

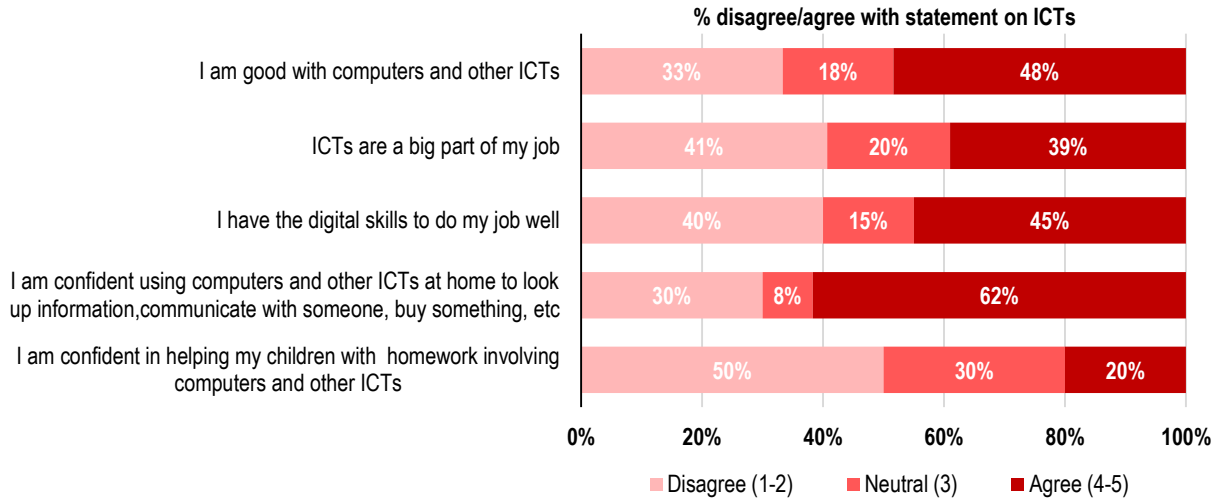


Source: Employee pre-training survey.

Information Communications Technologies (ICTs)

ICT use and comfort were fairly low among this group of employees. Figure 7 indicates that less than half the participants reported that ICTs were a big part of their job (39%) and only about a half (48%) felt they were good with computers. These gaps are corroborated by employers, as the next section profiling organizations will show. Outside work, three in five participants (62%) reported being confident using computer and other ICTs but only a fifth (20%) of those with children indicated they were confident in helping their children with homework using computers and other ICTs.

Figure 7 Information and Communications Technologies – attitudes and practices



Source: Employee pre-training survey.

Employment

Sector/occupation and job type

This program was designed to be used economy-wide and participants did indeed come from a range of industries and occupations, though there are no participants in client-service occupations as originally intended. There was a fairly even split in the participants between manufacturing and services. Seven in ten participants (69%) were in two fields: 46% in manufacturing and production occupations (e.g., processing, machine operating, assembling, natural resources occupations); and 23% in trades, transportation, and machinery occupations (e.g., industrial, electrical and construction trades; maintenance and installation). The rest were in more "white collar" positions: 14% were in business or administration-related occupations (e.g., office, financial, supply chain); 6% were managers; 6% were in government; and 4% in health.

A majority of participants were in full-time, year-round jobs consistent with the administrative criterion to select full-time employees in an effort to ensure their continued availability to participate in the piloting of the training in the workplace. Only 29% of participants are under short-term contract and/or regularly work on a part-time basis. This demonstrates that when the online training platform was piloted that it succeeded to include temporary workers.

Benefits and learning supports at work

Access to and take-up of employer benefits and learning supports was moderate to high. Almost all participants (92%) reported having paid vacation leave while about 63% said they paid sick leave and/or employer-paid medical, drug and/or dental insurance. Just over a third (37%)

reported receiving individual or group bonuses for doing well on the job. As for learning supports, about four in five (82%) reported participating in training generally on company time; the rest were in workplaces where this was not offered (7%) or those who did not take advantage of this option where it was offered (12%). Less than half (47%) reported that they have had their external education/training costs paid for by their employer, but 23% were in workplaces where this was not even offered. Similarly a little over half (53%) reported that they have taken paid or unpaid education leave at their workplace, with a fifth in workplaces without this option. Almost four in five participants (78%) agreed somewhat or strongly that they were happy with the training they received from their employer.

Psychosocial aspects of job and self

Job satisfaction, control and job health

Majorities of participants were satisfied in their jobs, had control at work, and had good mental health at work.

- **Job-satisfaction:** Large proportions agreed that that their workplace was family-friendly, i.e., employer lets them fit work around their family (77%), that they were happy with the overall quality of their working life (87%), and that they were happy with the training they received from the employer (78%).
- **Job control**: Seven in ten participants (70%) feel they have a say in their areas of work, while 75% disagreed that they do not have much control over how they do their job.
- **Job-related mental health**: Only about a third (35%) were stressed in their jobs, i.e., agreed that they experienced anxiety on their job, while few (15%) said they procrastinated at work, i.e., agreed that that they sometimes did things such as putting things off that lower their chances of doing well in their job.

A sizeable proportion reported experiencing anxiety and stress in their jobs (35%) and felt they had low degree of control over their work (30%). Other things equal, participants with higher stress and lower control over their work might be expected to engage less in training and experience more moderate improvements.

Self-actualization, self-efficacy

Large majorities of participants reported high levels of confidence, efficacy, persistence, self-improvement, organization/planning skills, and persistence in their jobs. These factors are typically associated with training success.

- **Self-efficacy**/self-reported proficiency: Almost all participants felt they did a good job (97%) or felt what they do at work is important or useful (95%).
- **Self-esteem**: Eight in ten participants (80%) reported having high self-esteem at work.
- **Self-improvement focus**: Almost all participants (92%) reported that they were more focused on improving/learning than on competing in their job.

- **Time/organization/planning skills**: A large majority of employees said they organize their time and work area so that they can work under the best conditions (93%) or that they try to plan out things they have to do in their job (86%).
- **Persistence**: Almost all participants (97%) agreed somewhat or strongly that they stick with their job even if it is difficult or challenging.

Future orientation

Participants showed mixed results with respect to future orientation. While a majority showed a moderate orientation to the future, a sizable minority were more focused on the present. Furthermore, a large proportion were fatalistic in their views of the future, attitudes that are less consistent with receptivity to training. A majority of participants (68%) agreed somewhat or strongly that meeting tomorrow's deadlines and other necessary work must come before tonight's play. Similarly, only a minority of participants agreed with more present-focused statements regarding making decisions on the spur of the moment (32%), about it not mattering what one does now (because "whatever will be, will be") (20%), and being more focused on the present than the future (18%). However, a small majority (62%) agreed somewhat or strongly that one cannot plan for the future because things change so much.

Social engagement

There is a fairly low level of social interaction among participants. Only 43% of participants took part in groups at work such as a social committee, health and safety committee, or employee-management or union committee. Social interaction can be a channel through which gains from training are further amplified, as interaction with co-workers during and after the training can provide further opportunities to reinforce what one learns from training.

Life satisfaction

There was a high degree of satisfaction among participants: Participants appear to be happy with their lives, for the most part. About 66% are quite happy (reporting 8 to 10 on a 10-point life satisfaction scale) and about 31% reported being somewhat happy (5 to 7). Only about 7% being unhappy (reported 5 or less).

Profile of participating organizations

Data for the eight organizations whose owners/managers responded in the pre-training employer survey (out of the nine that participated in the pilot) were analysed to produce frequency distributions, percentage incidences, or means to profile the organizations based on data mainly from the pre-training employer survey. Profile results are presented in terms of the basic characteristics of the organizations, as well as rewards and benefits, learning culture.

Region, size, workforce characteristics

Five provinces are represented among participating organizations, two from each of Alberta, New Brunswick and Quebec, and one each from Manitoba and Nova Scotia. By sector, the organizations are equally split between manufacturing and services (i.e., four in each sector). Half the

organizations considered their workforce to be primarily French-speaking and half English-speaking.

Participating organizations have on average 84 employees, with an average 44 employees being female. Of the eight organizations that participated in the pre-training employer survey, there were three organizations with less than 30 employees, another three with between 30 and 74, and two with 75 or more employees, one of which has 375 employees. **Technically, this means that all organizations, but one, are, by Statistics Canada standards, small organizations (<100 employees), or that, by Industry Canada standards, are all indeed small or medium-sized organizations (<500 employees).**[11]

On average, 72% of the organizations' workforce is not full-time, i.e., working under short-term contract, and/or in a temporary job, or on a part-time basis (<30 weekly hours on average), or regularly work on a part-year or seasonal basis. Three organizations have 30% or less of their workforce that is not full-time and three have all their workforce that is not full-time.

Rewards and advancement

Half of the eight responding organizations had a payroll over the last quarter of under $200,000, or $800,000 annually. Another three had between $200,000 and $399,999, and the remaining two had a payroll of $500,000 or greater over the last quarter, $2,000,000 annually.

As for rewards and benefits, only two organizations had performance-based pay, i.e., a reward system based on good performance. Organizations reported a high degree of employee access to various employer-provided benefits, as over half their staff, on average, had access to various benefits. Almost all of the staff (95%) on average were reported to have access to vacation leave (with three-quarters reporting 100% access), 85% on average for sick leave (with half reporting 100% access), 78% on average for training cost coverage (with 75% reporting 100% access), and 66% for medical, dental and drug insurance (with 38% reporting 100% access).

Turning to advancement, all but one of the organizations sometimes or often promote workers in their organization, and all but two choose managers and supervisor sometimes or often from within the organization.

Training culture

For the most part, there is a fairly strong overall training culture in participating organizations. Managers/owners of six out of the eight responding organizations strongly agree with the statement that training is important to the profitability of the organization, while the other two agreed somewhat or were neutral. No organizations disagreed with this statement.

11 See Statistics Canada: http://www.statcan.gc.ca/daily-quotidien/130612/dq130612a-eng.pdf (for the definition of business size in the Survey of Digital Technology and Internet Use). Another definition of small and medium-sized enterprises, used by Industry Canada, is those organizations with less than 500 employees: http://www.ic.gc.ca/eic/site/061.nsf/eng/02803.html.

As for total training expenditures, among the seven organizations that responded to the respective question, one spent $50,000 on training over the last year, three spent $10,000 to $20,000, and three spent $5,000 or less. No organizations reported spending less on training over the previous 12 months than the average annual amount spent over the previous two or years. Six reported spending about the same and two reported spending more.

However, only one organization spent anything ($5,000) on training last year to increase the digital skills of their staff. Given reported digital skills gaps, this lack of spending on digital skills training suggests a need for the training being provided by this model.

Digital Essential Skills (DES)

A majority of organizations reported at baseline (before the training) that their staff were not proficient in performing each digital essential skill, thus indicating need for the DES training as well much room for improvement by means of it. The first column of Table 2 indicates mean employer ratings of the DES proficiency of their employees of less than 6 on the 10-point scale, ranging from 1=very low to 10=very high proficiency, indicating fairly low levels of employer-reported DES proficiency. The second column indicates large majorities of employers rating their employees' DES proficiency at less than 8, suggesting a lack of skills and much room for improvement in many organizations. These results corroborate the results from the previous employee profile section on DES gaps.

Table 2 Digital Essential Skills gaps: employers' baseline view of employees' proficiency

Digital Essential Skill	Mean score*	No. reporting less than high level of DES proficiency (<8)*
Communicate electronically (by email) with co-workers, suppliers or clients to coordinate workplace activities (n=8)	5.9	6
Consult/read and Use digital document on the Internet or by accessing databases (n=8)	4.9	7
Fill out digital forms and do commercial transactions on the Internet (n=6)	4.3	5
Use new digital technologies to access workplace coordination, collaboration and training tools (n=7)	4.4	6
Search, select and save useful information by using the Internet in a workplace problem-solving context (n=8)	4.8	7

Notes: *Employers asked to rate on a 10-point scale their staff's proficiency in each of the five digital essential skills, ranging from 1=not at all proficient to 10=extremely proficient.

Source: Employer pre-training survey.

Information Communications Technologies (ICTs)

A majority of organizations reported low levels of acceptance, confidence and competence with respect to Information Communications Technologies (ICTs) among their staff, further corroborating the existence of a gap that may be addressed by the project's training. Employers were asked to rate level of each ICT indicator on a 4-point scale, from 1=extremely low, 2=somewhat low, 3=somewhat high, and 4=extremely high. The results in Table 3 indicate that for all indicators but level of acceptance of ICTs in the workplace, which had the highest mean rating at 2.8, most employers reported somewhat or extremely low levels (levels 1 or 2 on the scale). These results corroborate the results from the previous employee profile section on ICT proficiency gaps.

Table 3 Information Communications Technologies (ICTs): employers' baseline view of employees' acceptance, confidence, competence

ICT measure	Mean level*	No. of employers reporting extremely low or somewhat low level ICT measure*
Level of acceptance of new ICTs in the workplace (n=8)	2.8	4
Level of confidence/comfort in using ICTs (n=8)	2.3	6
Level of competence/proficiency in using ICTs (n=6)	2.0	6
Amount of time it takes to complete tasks using ICTs (n=7)	1.9	7
Level of overall use of ICTs (n=8)	2.1	6

Notes: *Employers asked to rate level on a 4-point scale, from 1=extremely low, 2=somewhat low, 3= somewhat high, and 4=extremely high.
Source: Employer pre-training survey.

Organizational performance

Organizational performance was fairly static, generally speaking neither worsening nor improving in the year prior to the training. Employers rated their performance in the previous year on a 7-point scale, from 1=got much worse to 7=got much better. Column 1 of Table 4 indicates means in the 4-5 range which is in the middle of the scale. Rated performance was highest in employee satisfaction/ morale (mean 5.4). The second column indicates that owners/managers of few organizations (n=8) reported deteriorating performance over the last year (rating of less than 4). The areas where more than one organization reported performance declining were in the areas of employee turnover and organizational capacity for change.

Table 4 Organizational performance in year before the training, self-reported

Performance indicator	Mean rating**	No. of orgs reporting worsening performance (<4)
Productivity and costs		
Sales revenue	4.4	1
Productivity/efficiency: time to complete a task	4.1	0
Errors on job: in making a product or providing a service	4.6	1
Cost-control, wastage: unused or misused supplies	4.3	1*
Health and safety		
Absenteeism: days off work	4.1	1
Employee turnover: employees leaving the organization	4.6	3
Workplace safety: injuries on the job	4.0	1
Product/service provision		
Product or service quality	4.3	0
Communication/relations with customers and suppliers	4.4	0
Customer satisfaction	5.0	0
Human resources		
Inter-employee relations/communications	4.9	0
Staff development and training: training provision/participation	5.1	0
Organizational capacity for change	4.7	2*
Employee satisfaction/morale	5.4	0
Employee-management/supervisor relations	5.0	1
Employee confidence	4.9	1
Employee engagement/involvement and sense of belonging	5.0	2*

Notes: n=8 organizations;

*=where 1 or 2 organizations felt that a lack of DES was the reason for the worsening performance;

**Employers asked to rate organizational performance since the training on a 7-point scale, where 1=got much worse to 7=got much better.

Source: Employer pre-training survey.

Very few owners felt that the lack of digital skills was the reason for a decline in performance. Where performance was worsening (rating of <4), employers were asked if the lack of the digital skills was a factor. Few employers attributed the decline to the DES lack. The areas where one or two employers felt the lack of DES was the reason were: cost-control, employee turnover, and organizational capacity for change. This suggests that participating employers at baseline did not see that the DES training would necessarily help improve their organization's performance.

Profile of training – attributes and intentionality

Various implementation features of the digital skills training model can also affect its effectiveness. While outcomes of the training are presented in the next chapter, this section presents, first, a description of the training in terms of number of participants taking each digital task area, the mean number of hours, and the number of online sessions. Second, we present results for a set of pre-training variables that may be broadly called "intentionality" indicators, covering the reasons and motivations of participants for taking the training (motivations), their understanding, confidence and expectations of the training, and employer expectations for how effective it would be for improving employees' attitudes toward and use of ICTs.

Training attributes

Platform data indicate that a large majority of participants accessed each learning step a small number of times. Table 5 indicates that, apart from the first steps of Workshops 1 and 2, the mean number of attempts was less than two, particularly after the first learning step of the first workshop, suggesting initial unfamiliarity with the platform that was soon dissipated by use. The results also indicate that a very small minority of participants made greater than two attempts at a learning step. **This suggests that the platform and content were "pitched" at the right level (or suitable) for most participants, thus fulfilling one of the implementation objectives** (see next chapter). Note that frequent attempts may also be an indicator of, rather than of difficulty, participants' being too busy at work to spend much time on a training step over a period of time, which on average took a participant 20-25 minutes to complete, up to 6 minutes of which was spent per task area on training per se, which in total amounted to a maximum of two hours of training. Note that other aspects of the training such as pattern of use and autonomy will be presented in conjunction with the expected implementation outcomes in the next chapter.

Table 5 Number of attempts at the training, by learning step and workshop

Training workshop and learning step number	Mean No. of attempts	Proportion trying > 2 times (%)
Workshop 1		
Step 1 (n=63)	2.8	31.8
Step 2 (n=55)	1.7	16.4
Step 3 (n=51)	1.9*	17.7

Training workshop and learning step number	Mean No. of attempts	Proportion trying > 2 times (%)
Workshop 2		
Step 1 (n=39)	2.4	18.0
Step 2 (n=37)	1.4**	10.8
Step 3 (n=37)	1.4	5.4
Workshop 3		
Step 1 (n=23)	1.8	17.4
Step 2 (n=17)	1.8	11.8
Step 3 (n=17)	1.7	11.8

Notes: *Computed without two outliers of 186 and 324 attempts at this learning step;

**Computed without an outlier of 188 attempts at this learning step.

Source: Platform data.

Training intentionality/engagement

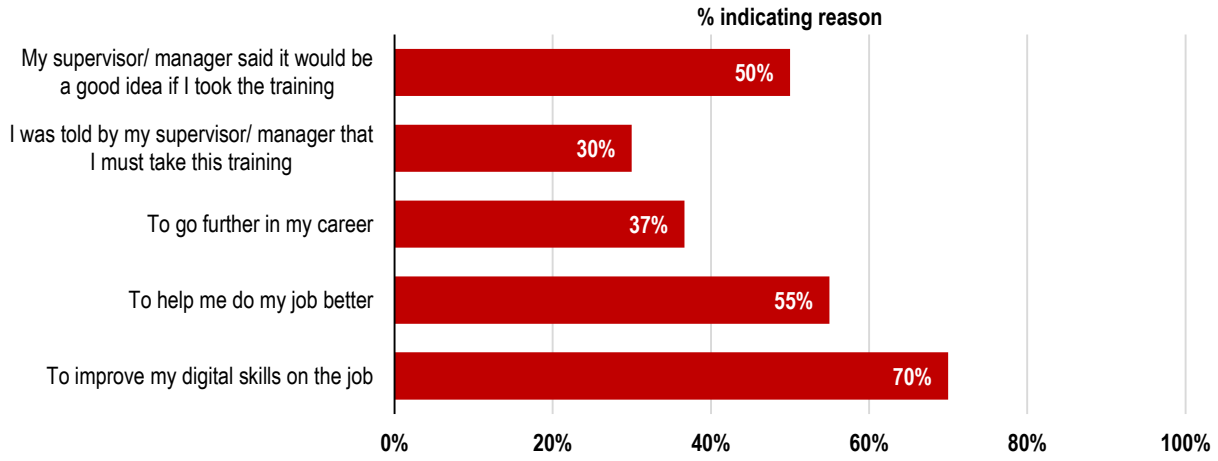
Research has shown that employers and employees who not only understand the goals of training but are also motivated and optimistic about it are more likely engage with the content and ultimately benefit from it, which is why it is important to understand their motivations and expectations.

Employee motivation/expectations

While the majority of participants are volunteering to take the training, a large minority were instructed to do so by their supervisors. Figure 8 indicates that about 30% of participants said they were required to take the digital skills training by their manager/supervisor, while about a half said they were encouraged to take it ("it would be a good idea"). Those for whom the training is mandatory might be expected to engage and gain less from the training as those who took it on their own volition.

Participants understood the objective of the training (i.e., to increase DES). Regarding personal reasons for enrolling in the training, Figure 8 indicates that 70% said it was to improve their digital skills, which corresponds to the objective of the training. Just over half the participants (55%) took the training to do their job better, and 37% took it to improve their career prospects.

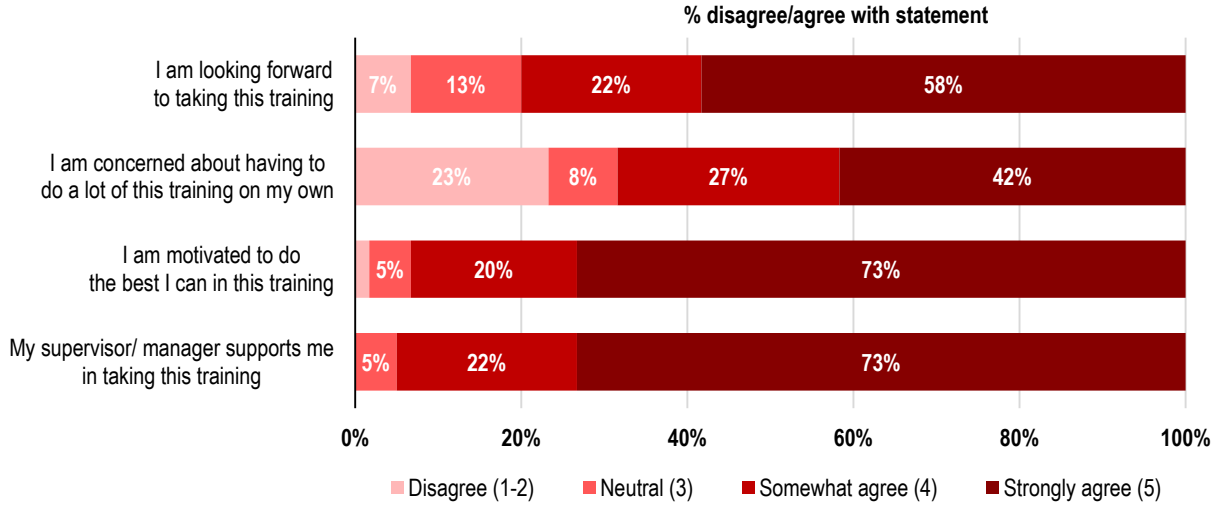
Figure 8 Employees' reasons for taking the DES training



Source: Employee pre-training survey.

Participants were strongly engaged in the process: before the training, motivation, expectations and employer support for the training were high, however, a large proportion had concerns about having to do the training on their own (autonomously). As Figure 9 indicates, four in five participants (58+22=80%) agreed somewhat or strongly that they were looking forward to the training and 93% (20=73) that they were motivated to do their best in the training. However, about two-thirds (27+42=68%) were concerned about having to do the training on their own. We might expect that this group experienced greater difficulty with this self-directed training product.

Figure 9 Employees' expectations and perceived employer support, pre-training



Source: Employee pre-training survey.

Employer support/confidence

Employer support for the training was also high according to participants. As indicated in the last bar of Figure 9 above, almost all participants (22+73=95%) agreed somewhat or strongly that their supervisor/manager supports them in the training.

Employers themselves reported being engaged in the process and optimistic that it would improve their employees' ICT acceptance and proficiency. Most reported being confident at baseline that the DES training would increase, in regard to ICTs, employee acceptance, comfort, proficiency, the amount of time to do tasks, overall use. The first column of Table 6 indicates **high mean confidence levels for all ICT indicators reported by employers** on the 10-point confidence scale, ranging from 1=not at all confident to 10=extremely confident. Columns 2 and 3 indicate that no organization rated their confidence at less than 5 on the 10-point scale and about half rated as high, i.e., 8 or higher.

Table 6 Information Communications Technologies (ICTs): employers' baseline rated confidence* in DES training improving employees' ICT attitude/use

ICT measure	Mean confidence that DES training would improve it	No. of employers reporting >7	No. of employers reporting >5
Level of acceptance of new ICTs in the workplace	7.3	4	8
Level of confidence/comfort in using ICTs	7.5	4	8
Level of competence/ proficiency in using ICTs	7.5	3	8
Amount of time it takes to complete tasks using ICTs	7.3	3	8
Level of overall use of ICTs	7.9	5	8

Notes: n=8 for all measures. *Employers asked to rate their confidence that the DES training will improve various ICT measures on a 10-point scale, ranging from 1=not at all confident to 10=extremely confident.

Source: Employer pre-training survey.

Chapter 4: Implementation success

In this chapter we present the results of the analysis of various indicators of implementation success. This includes indicators of flexibility (in terms of the training accessibility and customizability), suitability (in terms of its appropriateness for low-literacy workers) and a number of additional implementation delivery factors. We also present key subgroup differences in the experience of participants on a subset of these critical indicators of the successful implementation of the training model.

Main implementation findings

Meeting main implementation objectives

- **The main implementation objectives of the DES training model relating to flexibility and usability have been met.** Regarding flexibility, sizeable proportions valued its accessibility as to time and location and took advantage of the accessibility features, far in excess of traditional workplace LES training models. A large majority also valued being able to customize parts of their training experience. Employers, too, were happy with the customizability aspect of the model. Similarly for usability, most participants found the platform navigable and the content accessible for low-literacy workers. **However, participants registered some concerns with navigating the login section and with the content of the platform tests and surveys.** These are problems that could likely be addressed with the introduction of a learner instruction manual or video in the full-production version of this product.
- **There is evidence that the third usability objective – autonomy – may have been more challenging to meet, or at very least, was not a significant priority of most participants.** Sizable proportions of participants never took the training on their own and/or they required assistance from their Instructor or Guide. Also, a large proportion of employees expressed some concern before the training about its self-directed nature. This suggests the possible need by program administrators to better prepare prospective employees for this aspect of the model, such as by providing a learners instruction manual and/or a presentation video, as is intended in the future.
- **The subgroup analysis revealed few differences among subgroups, suggesting its wide applicability across the population.** In particular, there were no differences in perceptions of content-accessibility by literacy level, suggesting low-literacy workers can access the training product's content as easily as higher literacy ones.
- **However, there were two interesting differences by groups defined by engagement in the training.** First, participants who volunteered for the training were more likely to understand its content than those who were required or instructed to take the training. This points to the value, in information sessions, of making employers and employees aware of the value of voluntary participation in the program. Second, those who voluntarily participated in the program were more likely to do the training autonomously on their own, further underlining the need to make the value of voluntary participation clear when recruiting participants.

Attaining other implementation outcomes

- **Large proportions of participants reported being happy with all aspects of the training, particularly, with the assistance provided by the Guide and the Instructor.** Large proportions were happy with the help provided by the Instructor and the Guide, the computer hardware, the assessments and survey on the platform, and the training overall.
- **However, there is some indication that the speed of the platform was a concern for some participants suggesting a possible area for improvement.** Only a half were happy with the speed of the software. It is unclear whether this relates to constraints with the software itself or with the bandwidth available to the participant accessing it; however, concerns were also expressed with the Internet connection. This would suggest the need in the future to work with employers and developers to ensure participants have access to high-speed software and hardware.
- **Satisfaction among employers with key components of the training platform was also fairly high, with some provisos.** Most were satisfied with such elements as managing the organization's training program, assigning workshops to employees based on need, and monitoring employee progress. However, more than half the participating organizations recommended improvement in technical support and navigation instructions. Indeed, in the full-production of the training model, a manager instruction manual will be provided, which should address these concerns.

The detailed results are presented below for the two main implementation issues: **flexibility** and **suitability for lower literacy workers**.

Flexible training model: accessible and customizable

Accessibility

There is evidence that the accessibility objective of the training model was attained. First, regarding flexibility as to time, Table 7, Panel 1, indicates that over a quarter (27%=100%-73%) of respondents to the relevant question on the End-of-Workshop Survey did **not** participate in the training during the regular training schedule (specifically at home and during free time at work). The table further indicates that about a third (35%) of participants in Workshop 2 liked the fact that they could take the training **when** they wanted. Almost a quarter (23%) took the training during their leisure hours (outside work hours) and 15% took the training during their free time at work.

As for flexibility as to place, Panel 2 indicates that two in five participants (39%) liked the fact that they could take the training **where** they wanted.

Finally, regarding flexibility as to device, Panel 3 indicates that only 12% of participants took the training on equipment other than a tablet computer, which is as expected since the tablet was intended by the developers to be the device participants would use for this training. Still participants could have taken the training on another device, if they had the opportunity, but did not.

Table 7 Flexibility indicators: accessible as to time, place and device

Indicator	Number	Proportion of respondents to question (%)*
1. Accessibility as to time		
Question: When did you participate in the e-learning program**? (Workshop 2 survey, n=28)		
During the training schedule set by my employer	19	73
Outside work hours (at home during my leisure hours)	6	23
During my free time at my workplace	4	15
During my work breaks	2	8
After my workday	1	4
Question: What did you like about this training? I was able to follow training when I wanted		
Workshop 2 survey (n=28; 23 answered question)	8	35
Workshop 3 survey (total n=8; 5 answered question***)	5	100***
2. Accessibility as to place		
Question: What did you like about this training? I was able to follow training where I wanted		
Workshop 2 survey (n=28; 23 answered question)	9	39
Workshop 3 survey (n=8; 5 answered question***)	4	80***
Question: No. of hours of training spent at home *(post-training employee survey, n=60; 52 answered question)*		
0	40	77
1 to 10	7	13
Greater than 10	2	4
Other-time undefined	3	6

Indicator	Number	Proportion of respondents to question (%)*
3. Accessible as to device		
Question: Type of device participant did training on *(Workshop 1 survey, n=42; 41 answered question)*		
Tablet only	36	88
Computer only	3	7
Both	2	5

Notes: *Number who selected response divided by number of people who answered question.

**Multiple response question, so percentages do not add to 100.

***Results should be treated with caution given the small number of participants for this workshop.

Source: End of workshop surveys and employee post-training surveys.

Subgroup differences in flexibility

Differences were assessed across key subgroups in the experiences of participants with flexibility of the model – specifically with respect to whether they participated in e-learning outside of work hours, either, at home or during free time at work. Table 8 illustrates that differences in this kind of flexibility were apparent for several subgroups. Women (57.1%) were significantly more likely to report flexible access to training at home or during free time at work than were men (16.7%); similarly, English-speaking participants (66.7%) more so than French-speaking participants (9.1%); and those who were more active in their workplaces prior to training (62.5%) compared to those who were not (20.0%). Finally, the largest difference was observed between those participants who were instructed to take the training and those who were not. **Participants whose participation was mandatory or strongly encouraged accessed the training outside of regular hours at very low rates (14.3%) compared to those who voluntarily took part (66.7%).** There were no differences observed in flexibility measures of those with varying literacy levels, education levels or occupations.

Table 8 Flexibility indicators, by subgroup: participated in e-learning at home or during free time at work

Subgroup	Percentage of Participants	Difference	Significance
Participated in e-learning at home OR during my free time at work			
All (workshop 2 participants, n=28)	38.5		
Gender			
Male	16.7		
Female	57.1	-40.5	**Yes** (P=.0351)**
Language			
English	66.7		
French	9.1	57.6	**Yes** (P=.0103)**
Occupation, Sector			
Services, Administrative	33.3		
Production, Manufacturing	42.9	-9.5	No
Postsecondary education			
None	41.2		
Some	33.3	7.9	No
Baseline literacy level			
2 or 2-	40.0		
2 +	35.7	4.3	No
Particpated in workplace groups			
Yes	62.5		
No	20.0	42.5	**Yes** (P=.0432)**
Supervisor/manager told me to take the training ("volun-told")			
Yes	14.3		
No	66.7	-52.4	**Yes*** (P=.0047)**

Source: End of workshop surveys and employee pre- and post-training surveys.

Customizability

Employees were happy with the amount of customizability of the training platform.
Employees were asked how much they liked certain aspects of the platform on a 10-point scale, ranging from 1=did not like this at all or no choice at all, to 10=liked it a great deal or a lot of choice. Panels 1 and 2 of Table 8 indicates that large majorities (responding with ≥ 5 on the scale) liked or

liked a lot the fact that they were able to retake workshops (89% Workshop 2, mean=7.6; 75% Workshop 3, mean=7.3) and retake tests (89% Workshop 2, mean=7.9; 88% Workshop 3, mean=7.6). Panel 3 indicates that smaller majorities felt they had at least a fair amount of choice (responding with >4 on the scale) in selecting exercises for the workshops (61% for Workshop 2 (mean=5.1) and 50% for Workshop 3 (mean=4.6)). The final panel of Table 9 indicates that the majority of the people who answered the respective questions said they skipped learning steps in a workshop, indicating participants were taking the training according to their need, i.e., customizing it. However, the administrative data (not shown in table) indicate that only three participants skipped a step (one in the case of step 1 and two for step 2) and one skipped step 1 of Workshop 2.

Table 9 Customizability indicators

Indicator	Mean	Number	Proportion of respondents to question (%)
1. Question: Did you like being able to retake part of a workshop*?			
Workshop 2 survey (n=28)	7.6		
1 to 4 (didn't much like it)		3	11
5 to 7 (liked it)		9	32
8 to 10 (liked it a lot)		16	57
Workshop 3 survey (n=8***)	7.3		
1 to 4 (didn't much like it)		2	25
5 to 7 (liked it)		2	25
8 to 10 (liked it a lot)		4	50
2. Question: Did you like being able to retake a test*?			
Workshop 2 survey (n=28)	7.9		
1 to 4 (didn't much like it)		3	11
5 to 7 (liked it)		6	21
8 to 10 (liked it a lot)		19	68
Workshop 3 survey (n=8***)	7.6		
1 to 4 (didn't much like it)		1	13
5 to 7 (liked it)		3	38
8 to 10 (liked it a lot)		4	50

Indicator	Mean	Number	Proportion of respondents to question (%)
3. Question: Do you feel you had a choice regarding the type of exercises to complete**?			
Workshop 2 survey (n=28)	5.1		
1 to 4 (little choice)		11	39
5 to 7 (some choice)		10	36
8 to 10 (much choice)		7	25
Workshop 3 survey (n=8***)	4.6		
1 to 4 (little choice)		4	50
5 to 7 (some choice)		2	25
8 to 10 (much choice)		2	25
4. Number of participants skipping steps			
Workshop 1 survey (n=42)			
No		5	83
Yes		1	17
Workshop 2 survey (n=28)			
No		4	100
Yes		0	0
Workshop 3 survey (n=8***)			
No		1	50
Yes		1	50

Notes: *Employees were asked how much they liked certain aspects of the platform on a 10-point scale, ranging from 1=did not like this at all, to 10=liked it a great deal.

**Employees were asked how much choice they had in exercises on a 10-point scale, ranging from 1=had no choice at all, to 10=had lot of choice.

***Results should be treated with caution given the small number of participants for this workshop.

Source: End of workshop surveys.

Employers also rated the customizability of the platform fairly high. One indicator of customizability for employers is the degree to which employers liked the functionality of assigning different workshops to different employees depending on employees' needs, using a 10=point scale ranging from 1=did not like it at all, to 10=liked it a great deal. Not one organization rated this feature at less than 5. Four of the seven organizations answering this question rated it at 9 or 10 ("liked it a lot") and the other rated it at 5-7 ("liked it somewhat"). Another indicator of customizability for employers is the rated ease of use of the feature of the platform enabling

employers to assign individual workshops to meet specific employee needs, using a 10-point scale, ranging from 1=not at all easy to use, up to 10=very easy to use. Of the seven organizations that responded to this question, not one rated this feature at less than 5. Four rated ease of use highly (8-10) and three rated it in the mid-range (5-7).

Subgroup differences in customizability

Differences were assessed across key subgroups in the experiences of participants with customizability of the training – specifically with respect to whether participants liked that they could retake part of a workshop. Table 10 illustrates that differences in customizability were apparent for only two subgroups. Women had a nearly 2-point higher mean response (on the 10-point scale) than men (8.5 vs. 6.7) affirming their stronger interest in customization, in terms of being able to repeat lessons. Similarly, participants in production and manufacturing positions had a two-point higher mean response than those in services (8.5 vs. 6.7). There were no other subgroup differences observed in opinions related to this dimension of customizability, including for those with different literacy levels or education prior to training.

Differences were also assessed across key subgroups in the opinions of participants with respect to whether participants liked choice in the type of exercises. For this measure, once again women had an over 2-point higher mean response (on the 10-point scale) than men (6.1 vs. 3.9). Similarly, participants who voluntarily participated in the training had a 2.1 higher mean response than those who were required or instructed to take the training (6.3 vs. 4.2). There were no other subgroup differences observed in opinions related to choice in types of exercises, including for those with different literacy levels or education prior to training.

Table 10 Customizability Indicators, by subgroup: Liked that I could retake part of a workshop

Subgroup	Mean Score (out of 10)	Difference	Significance
Liked that I could retake part of a workshop (scale from 1 to 10)			
All (workshop 2 participants, n=28)	7.6		
Gender			
Male	6.7		
Female	8.5	-1.8	**Yes* (P=.0856)**
Language			
English	6.3		
French	7.9	-1.6	No
Occupation, Sector			
Services, Administrative	6.7		
Production, Manufacturing	8.5	-1.8	**Yes* (P=.0856)**
Postsecondary education			
None	7.6		
Some	7.7	-0.1	No
Baseline literacy level			
2 or 2-	8.1		
2 +	8.0	0.1	No
Particpated in workplace groups			
Yes	7.0		
No	7.6	-0.6	No
Supervisor/manager told me to take the training ("volun-told")			
Yes	7.8		
No	7.6	0.2	No

Source: End of workshop surveys and employee pre- and post-training surveys.

Suitable of training for low-literacy workers

There are three components to this implementation issue: usability, content-accessibility and autonomy. Evidence for each is presented in turn.

Usability/navigability

Participants found the platform quite usable, thus meeting a major objective of the training program. We have two results pointing to this outcome. The first panel of **Table 11** indicates that four in five participants (86%, 82%, and 88%, for the three workshops, respectively) found it navigable; this is measured as the ease in finding oneself around the training. i.e., reporting 5-7 (=somewhat easy) or 8-10 (=quite easy) on a 10-point scale ranging from 1=not at all easy, to 10=very easy. The second panel of the table indicates, again, over four in five participants were comfortable during the training, with high mean ratings of 7.7 and 7.6 for workshops 2 and 3, again implying usability. Being comfortable is measured on a 10-point scale ranging from 1=not at all comfortable, to 10=very comfortable.

Table 11 Usability indicators

Indicator	Mean	Number	Proportion of respondents to question (%)
1. Question*: How easy was it to find your way around (i.e., navigate) in this training?*?			
Workshop 1 (n=42)	6.8		
1 to 4 (difficult)		6	14.3
5 to 7 (somewhat easy)		18	42.9
8 to 10 (quite easy)		18	42.9
Workshop 2 (n=28)	6.7		
1 to 4 (difficult)		5	17.9
5 to 7 (somewhat easy)		12	42.9
8 to 10 (quite easy)		11	39.3
Workshop 3 (n=8***)	7.4		
1 to 4 (difficult)		1	12.5
5 to 7 (somewhat easy)		3	37.5
8 to 10 (quite easy)		4	50.0

Indicator	Mean	Number	Proportion of respondents to question (%)
***2. Question:** Did you feel comfortable during the training*			
Workshop 2 (n=28)	7.7		
1 to 4 (uncomfortable)		3	10.7
5 to 7 (somewhat comfortable)		8	28.6
8 to 10 (very comfortable)		17	60.7
Workshop 3 (n=8***)	7.6		
1 to 4 (uncomfortable)		1	12.5
5 to 7 (somewhat comfortable)		3	37.5
8 to 10 (very comfortable)		4	50.0

Notes: *Employees were asked how easy it was on a 10-point scale, ranging from 1=not at all easy, to 10=very easy.

**Employees were asked how much choice they had in exercises on a 10-point scale, ranging from 1=not at all comfortable, to 10=very comfortable.

***Results should be treated with caution given the small number of participants for this workshop.

Source: End of workshop surveys.

About half of participants asked for navigation help, with the login section being most often the target. Another source of data on content-accessibility is the Instructors testing report that captures information on employees seeking assistance. Of the 67 participants, 34 or 57% sought assistance for with platform navigation and, on average among those seeking help, assistance was requested 2.3 times. Those seeking assistance most frequently did so for the login section (68% of those who sought help). The second and third most frequently features for which help was needed were the current tab (41%) and the progress tab (32%). Participants requesting assistance were asked to indicate the reasons why help was sought and the most frequently cited reason, by far, was a technical problem, identified by 97% of those who sought help. A lack of digital skills was another often identified reason, though far less so at 59%.

Most of the reasons why the participants asked for help about navigation could have been addressed by a learner instruction manual. This is what participants suggested and what is being seriously considered for the full-production version of the model. A learner instructor manual explaining the login section and the navigation interface could greatly have enhanced the usability of the platform. The manual could have provided information needed for the learner to login autonomously and have addressed most of the questions that participants had about navigation.

Finally, as noted in the training profile section of the previous chapter, participants generally had to make few attempts at a learning step. Few made more than two attempts, other than the first learning step of Workshop 1, which suggests initial unfamiliarity with the platform which diminished as time went on. **This again suggests that the training was suitable for most participants.**

Subgroup differences in usability

Differences were assessed across key subgroups in the experiences of participants with usability of the training – specifically with respect to whether participants were comfortable during the training. Table 12 illustrates that differences in levels of comfort were apparent for only two subgroups. Participants with a higher degree of perceived control over their jobs had a nearly 2-point higher mean response (on the 10-point scale) than those with lower levels of control (8.5 vs. 6.7) affirming their higher levels of comfort. Similarly, participants who did not participate in workplace groups prior to training had higher levels of comfort during the training (8.5 vs. 6.7). There were no other subgroup differences observed in this key dimension of usability, including for those with different literacy levels or education prior to training.

Table 12 Usability indicators, by subgroup: did you feel comfortable during training

Subgroup	Mean Score (out of 10)	Difference	Significance
Do you feel comfortable during the training (scale from 1 to 10)			
All (workshop 2 participants, n=28)	7.7		
Gender			
Male	7.4		
Female	8.0	-0.6	No
Language			
English	6.8		
French	8.3	-1.5	No
Occupation, Sector			
Services, Administrative	7.5		
Production, Manufacturing	7.9	-0.3	No
Postsecondary education			
None	7.7		
Some	7.7	0.0	No
Baseline literacy level			
2 or 2-	7.9		
2 +	7.6	0.2	No
Control over one's work			
Yes	8.6		
No	7.1	1.5	**Yes* (P=.0569)**
Particpated in workplace groups			
Yes	6.7		
No	8.1	-1.4	**Yes* (P=.0989)**
Supervisor/manager told me to take the training ("volun-told")			
Yes	7.5		
No	8.0	-0.5	No

Source: End of workshop surveys and employee pre- and post-training surveys.

Content-accessibility for low-literacy workers

Very few participants found the training content inaccessible, thus meeting another objective of this platform: to develop a training product containing language that is accessible to low-literacy workers. Participants were asked to rate the clarity and ease of understanding of the instructions and language used on the platform, on a 10-point scale, ranging from 1=not at all clear or easy to understand, up to 10=very clear or easy to understand. Table 13 indicates that about 93% (52.4+40.5; mean=6.9) found the instructions for Workshop 1 somewhat or quite easy to understand (with only slightly lower proportions for Workshops 2 and 3); about 93% (28.6+64.3; mean=7.8) found the language used during the training somewhat or quite clear (with somewhat lower proportions for the other workshops); and about 92% (31.0+61.9; mean=7.6) found the language used during the training somewhat or quite easy to understand (with slightly smaller proportions for the other 2 workshops).

Table 13 Content-accessibility indicators – 1

Indicator	Mean	Number	Proportion of respondents to question (%)
1. Question*: Did you find the instructions used during this workshop were easy to understand?			
Workshop 1 (n=42)	6.9		
1 to 4 (difficult to understand)		3	7.1
5 to 7 (somewhat easy to understand)		22	52.4
8 to 10 (quite easy to understand)		17	40.5
Workshop 2 (n=28)	6.7		
1 to 4 (difficult to understand)		5	17.9
5 to 7 (somewhat easy to understand)		12	42.9
8 to 10 (quite easy to understand)		11	39.3
Workshop 3 (n=8**)	7.0		
1 to 4 (difficult to understand)		1	12.5
5 to 7 (somewhat easy to understand)		3	37.5
8 to 10 (quite easy to understand)		4	50.0

Indicator	Mean	Number	Proportion of respondents to question (%)
2. Question*: Did you find the language used during this workshop was clear?			
Workshop 1 (n=42)	7.8		
1 to 4 (unclear)		3	7.1
5 to 7 (somewhat clear)		12	28.6
8 to 10 (quite clear)		27	64.3
Workshop 2 (n=28)	7.6		
1 to 4 (unclear)		4	14.3
5 to 7 (somewhat clear)		7	25.0
8 to 10 (quite clear)		17	60.7
Workshop 3 (n=8**)	7.3		
1 to 4 (unclear)		2	25.0
5 to 7 (somewhat clear)		2	25.0
8 to 10 (quite clear)		4	50.0
3. Question*: Did you find the language used during this workshop was easy to understand?			
Workshop 1 (n=42)	7.6		
1 to 4 (difficult to understand)		3	7.1
5 to 7 (somewhat easy to understand)		12	31.0
8 to 10 (quite easy to understand)		27	61.9
Workshop 2 (n=28)	7.4		
1 to 4 (difficult to understand)		4	14.3
5 to 7 (somewhat easy to understand)		8	28.6
8 to 10 (quite easy to understand)		16	57.1

Indicator	Mean	Number	Proportion of respondents to question (%)
Workshop 3 (n=8**)	7.5		
1 to 4 (difficult to understand)		1	12.5
5 to 7 (somewhat easy to understand)		4	37.5
8 to 10 (quite easy to understand)		3	50.0

Notes: *Employees were asked how clear or easy it was to understand on 10-point scales, ranging from 1=not at all clear or not at all easy to understand, up to 10=very clear or very easy to understand. **Results should be treated with caution given the small number of participants for this workshop.

Source: End of-workshop survey.

Table 14 presents further evidence, this time from the employee post-training survey, suggesting **training content was accessible to participants.** The first panel indicates that seven in ten participants (71%) agreed on a 5-point agreement scale that they understood the content of the training. The second panel indicates that majorities also found the content suitable with 63% saying they were happy with clarity of the information they received about the training (proportion that was almost identical to the proportion saying this at the start of the survey) and 67% being happy with how easy it was to take the training.

Table 14 Content-accessibility indicators – 2

Indicator	Mean	Proportion of respondents to question (%)
1. Question*: Please indicate whether you agree or disagree with the statement:		
I clearly understood the training content (n=52)	**3.8**	
Disagree (1-2)		17.3
Neutral (3)		28.9
Agree (4-5)		71.2

Indicator	Mean	Proportion of respondents to question (%)
2. Question: Please indicate how happy you are with the following aspects of the training:**		
How clear and complete the information received about the training was (n=52)	**3.7**	
Disagree (1-2)		17.3
Neutral (3)		19.2
Agree (4-5)		63.4
How easy it was to take the training (n=52)	**3.5**	
Disagree (1-2)		26.9
Neutral (3)		5.8
Agree (4-5)		67.3

Notes: *Employees were asked to agree or disagree with the statement on a 5-point scale, ranging from 1=strongly disagree up to 5=strongly agree, with the mid-point 3=neutral. **Employees were asked happy they were with the statements on a 5-point scale, ranging from 1=very unhappy up to 5=very happy, with the mid-point 3=neutral.

Source: Employee post-training survey.

The Instructors testing report was another source of data on content-accessibility. Of the 67 training participants, 35 or 52% sought assistance with the content of the platform, with an average of 3.8 times per participant seeking help with content. Assistance with the content was most frequently sought in Workshop 1, again possibly due to initial unfamiliarity, but also because there were more participants in this workshop than in others. Two-thirds of all content-assistance requests were in Workshop 1, with 12%, 11%, and 2% in Workshops 2, 3, and 4 respectively. The fact that only 3% of requests were for the Introduction section indicates the section was simple to use.

Consideration might be given to improving the content accessibility of the tests and surveys associated with the training. The reason is that content-assistance was much more frequently sought in regard to the tests and surveys administered before and after the training than to the training itself. Of the 89 times assistance with content was sought in Workshop 1, on only two occasions was it for training content; in Workshop 2, only four of the 16 times; and in Workshop 3, only 2 of the 12 times. As with the navigation-assistance results discussed above, offering a learner instruction manual would have addressed 70 of the content-assistance requests, suggesting consideration be given to offering an instruction manual in the future. As for reasons help was sought, instructors could check off multiple reasons and three reasons stood out: lack of digital skills (n=46), lack of clarity of an instruction (n=39), and lack of understanding related to low literacy level (n=34).

Subgroup differences in content-accessibility

Differences were assessed across key subgroups in the experiences of participants with the content-accessibility of the training – specifically with respect to whether participants felt the instructions were easy to understand. Table 15 illustrates that differences in the degree of perceived clarity of instructions were apparent for only one subgroup. Participants with a higher degree of perceived control over their jobs had a nearly 2-point higher mean response (on the 10-point scale) than those with lower levels of control (7.6 vs. 6.0). There were no other subgroup differences observed in this key dimension of content-accessibility, including for those with different literacy levels or education prior to training, suggesting lower literacy participants did **not** have difficulty understanding the content, as was intended.

Differences were also assessed across key subgroups for other content-accessibility indicators, specifically with respect to whether participants felt the language used during workshop was clear. Table 16 illustrates once again that differences in the degree of clarity of language were apparent for only one subgroup. **Participants who volunteered for the training had a 1.5 higher mean reported clarity of understanding (on the 10-point scale) than those who were required or instructed to take the training (8.4 vs. 6.9).** There were no other subgroup differences observed in language clarity, including for those with different literacy levels or education prior to training.

Table 15 Content-accessibility indicators, by subgroup: instructions easy to understand

Subgroup	Mean Score (out of 10)	Difference	Significance
Did you find the instructions easy to understand (scale from 1 to 10)			
All (workshop 1 participants, n=42)	6.7		
Gender			
Male	6.3		
Female	7.1	-0.8	No
Language			
English	6.2		
French	6.7	-0.5	No
Occupation, Sector			
Services, Administrative	6.8		
Production, Manufacturing	6.6	0.2	No
Postsecondary education			
None	7.0		
Some	6.2	0.8	No
Baseline literacy level			
2 or 2-	6.7		
2 +	6.9	-0.2	No
Control over one's work			
Yes	7.6		
No	6.0	1.6	**Yes** (P=.0416)**
Particpated in workplace groups			
Yes	6.2		
No	6.7	-0.4	No
Supervisor/manager told me to take the training ("volun-told")			
Yes	6.4		
No	7.1	-0.7	No

Source: End of workshop surveys and employee pre- and post-training surveys.

Table 16 Content-Accessibility Indicators, by Subgroup: Language used was clear

Subgroup	Mean Score (out of 10)	Difference	Significance
Did you find the language used during workshop clear (scale from 1 to 10)			
All (workshop 1 participants, n=42)	7.6		
Gender			
Male	7.2		
Female	7.9	-0.8	No
Language			
English	7.4		
French	7.5	-0.1	No
Occupation, Sector			
Services, Administrative	7.4		
Production, Manufacturing	7.7	-0.4	No
Postsecondary education			
None	8.1		
Some	6.8	1.2	No
Baseline literacy level			
2 or 2-	7.6		
2 +	7.6	-0.1	No
Control over one's work			
Yes	7.1		
No	8.2	-1.0	No
Particpated in workplace groups			
Yes	7.2		
No	7.5	-0.3	No
Supervisor/manager told me to take the training ("volun-told")			
Yes	6.9		
No	8.4	-1.5	**Yes* (P=.0707)**

Source: End of workshop surveys and employee pre- and post-training surveys.

Autonomy

Employee views of autonomy

In terms of autonomy, results indicate that the training platform is suitable for independent learning for a majority of participants. As shown in Table 17, almost two thirds of participants (64%) somewhat or strongly agreed with the statement, "I was comfortable with having to do the training on my own." While only about 15% of participants took the training on their own *most* of the time, almost half (42%) took it on their own at least *some* of the time. The first panel of Table 17 indicates a minority completed the training on their own, though the proportion rose with each workshop, from 11% in Workshop 1, 14% in Workshop 2, and 25% in Workshop 3, suggesting growing familiarity with use. The second panel indicates only about a third (35%) of the participants liked the ability to do the training on their own, though this proportion also increased with workshop number, to 60% in Workshop 3.

Taken together with the fact that participants reported the platform as highly usable, the training content as highly accessible – and given that a large proportion made use of the platform outside of work – these results suggest that the training platform is, indeed, suitable for independent learning for a majority of participants. At the same time, given there are no well-established benchmarks for appropriate levels of autonomy for online learning, participants' preferences provide a reasonable guide – and suggest that while flexibility in access is certainly important, independence of learning may be less important to participants.

It should also be noted that participants were involved in a pilot project, which itself may have led to higher levels of interaction with Guides and Instructors than would otherwise be the case in a wider non-pilot implementation of the platform. Participants often played an informal role in the platform development, where they were asked to report bugs or other areas for improvement, which would have encouraged further interaction rather than autonomous use. These results may also have been different had a learner instruction manual been made available to participating employees from the outset. As indicated in Chapter 2, the only instructions provided to participating employees at the first piloting session (when they received their printed Personalized Learning Plan along with their login information and the list of workshops to be completed) were instructions on how to access the login page with the iPad, to enter their login information, and to access the Learner section of the platform.

Table 17 Autonomy indicators

Indicator	Number	Proportion of respondents to question (%)
1. Question: Did you complete the workshop alone or did you receive help? I completed the training on my own.		
Workshop 1 survey (n=45)	5	11.1
Workshop 2 survey (n=28)	4	14.3
Workshop 3 survey (n=8**)	2	25.0
2. Question: What did you like about this training? I was able to follow the training by myself.		
Workshop 2 survey (n=23)	8	34.9
Workshop 3 survey (n=5**)	3	60.0
3. Question: About how much time did you take the training on your own, i.e., with nobody else in the same room taking the training? (Post-training employee survey, n=52)		
Never	22	42.3
Some of the time	22	42.3
Most of the time	8	15.4
4. Question: Indicate whether you agree or disagree with the statement*: I was comfortable with having to do the training on my own (Post-training employee survey, n=52)		
Strongly and somewhat disagree (1-2)	11	21.2
Neutral (3)	8	15.3
Somewhat and strongly agree (4-5)	33	63.5
5. Question: What did you like about this training? I was able to follow the training as quickly or as slowly as I wanted.(Self-Paced)		
Workshop 2 survey (n=23)	18	78.3
Workshop 3 survey (n=5**)	4	80.0

Notes: *Employees were asked to indicate how much they agree with the statement on a 5-point scale, ranging from strongly disagreeing to strongly agreeing. **Results should be treated with caution given the small number of participants for this workshop.

Source: End of workshop survey and employee post-training survey.

Employer view of employee autonomy

Only one organization out of the seven that answered the question was dissatisfied (reporting 1 or 2 on 5-point satisfaction scale) with the self-directed nature of the training. Four were very or somewhat satisfied (reporting 4 or 5) with it and two were neutral about it (reporting 3).

Subgroup differences in autonomy

Differences were assessed across key subgroups in the experiences of participants with the autonomy of the training – specifically with respect to whether they liked that they could take training on their own and whether they liked if it was self-paced. Table 18 illustrates that there were no significant differences in their preferences for taking the training on their own. Table 19 illustrates two important subgroup differences in preferences for the self-paced nature of training. Younger participants (those under 45 years of age) were significantly more likely to value the self-paced nature of the training compared to participants 45 and older (100.0% vs. 66.7%). Similarly, French-speaking participants valued the self-paced nature of training at higher rates than English-speaking participants (90.9% vs. 50.0%). There were no other subgroup differences observed in this key dimension of autonomy on any measure including for those with different literacy levels or education prior to training.

Table 18 Autonomy indicators, by subgroup: liked being able to do the training by myself

Subgroup	Percentage of Participants	Difference	Significance
Liked being able to do the training by myself			
All (workshop 2 participants, n=28)	34.8		
Gender			
Male	40.0		
Female	30.8	9.2	No
Language			
English	33.3		
French	36.4	-3.0	No
Occupation, Sector			
Services, Administrative	50.0		
Production, Manufacturing	26.7	23.3	No
Postsecondary education			
None	28.6		
Some	44.4	-15.9	No
Baseline literacy level			
2 or 2-	33.3		
2 +	36.4	-3.0	No
Particpated in workplace groups			
Yes	16.7		
No	35.7	-19.0	No
Supervisor/manager told me to take the training ("volun-told")			
Yes	38.5		
No	30.0	8.5	No

Source: End of workshop surveys and employee pre- and post-training surveys.

Table 19 Autonomy indicators, by subgroup: liked that I could do the training at my own pace

Subgroup	Percentage of Participants	Difference	Significance
Liked that I could do the training at my own pace			
All (workshop 2 participants, n=28)	78.2		
Gender			
Male	90.0		
Female	69.2	20.8	No
Age			
Under 45	100.0		
45 and over	66.7	33.3	**Yes** (P=.0192)**
Language			
English	50.0		
French	90.9	-40.9	**Yes* (P=.0626)**
Occupation, Sector			
Services, Administrative	87.5		
Production, Manufacturing	73.3	14.2	No
Postsecondary education			
None	85.7		
Some	66.7	19.0	No
Baseline literacy level			
2 or 2-	83.3		
2 +	90.9	-7.6	No
Particpated in workplace groups			
Yes	50.0		
No	85.7	-35.7	No
Supervisor/manager told me to take the training ("volun-told")			
Yes	76.9		
No	80.0	-3.1	No

Source: End of workshop surveys and employee pre- and post-training surveys.

Other indicators of implementation success

In this section, the results from the analysis of data on feedback on different aspects of the DES training other than flexibility and suitability gathered from mainly the employer and employee post-training.

Employee views of design and delivery factors

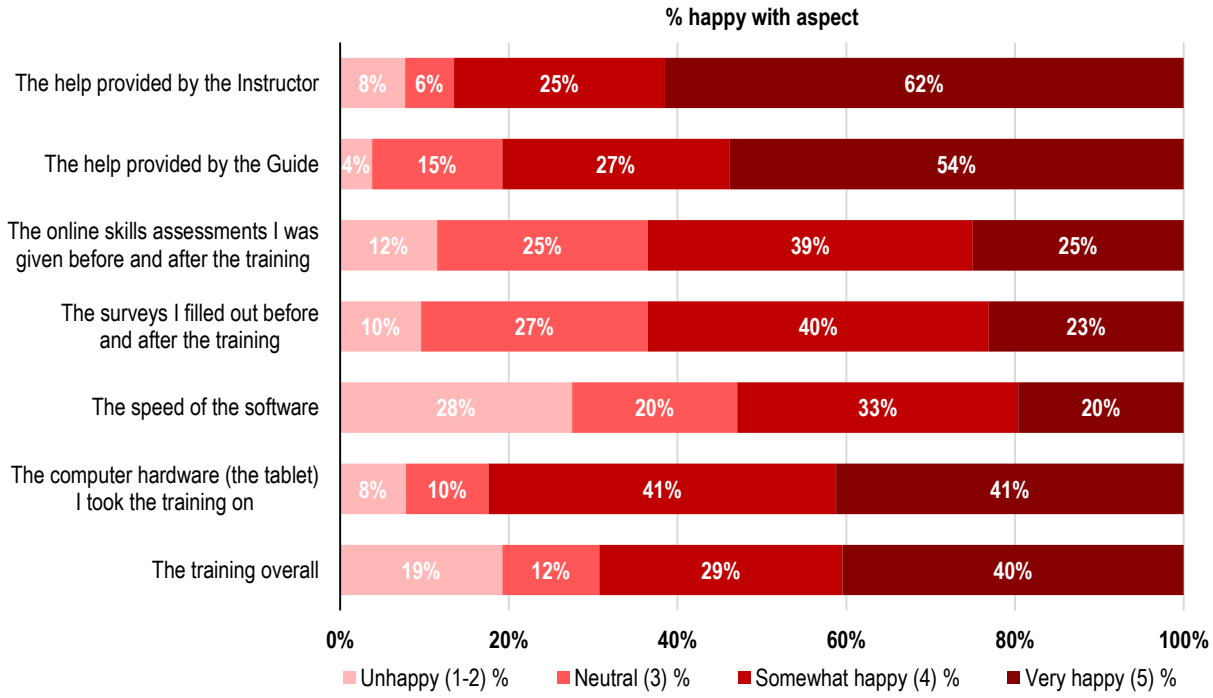
Satisfaction with aspects of model

Prior to the training, participants reported in the pre-training employee survey being happy with the few aspects of the model they had encountered to date. Here, "happiness" is rated on a 5-point scale, where 1=very unhappy and 5=very happy. Large majorities of participants said they were happy or very happy (4 or 5 on the scale) with the support of the Instructor (83%) and the Guide (77%). Smaller majorities were happy or very happy with the recruitment of employees (53%), the amount of information about the project they were provided (63%), and the clarity of the information provided (58%), the latter being an indicator, as presented earlier in this chapter, of one of the principal expected implementation outcomes of the training: suitability for low-literacy workers. As previously mentioned no instruction manual was offered to the participants to assist with their participation in the training and likely would have improved this result.

Post-training, large proportions of participants reported that they were happy with all aspects of the training, particularly the assistance provided by the Instructor and Guide and the tablet they took the training on. As Figure 10 indicates, over 8 in 10 participants were somewhat or very happy with the help provided by the Instructor and the Guide (87% and 81%, respectively). In both cases this represents an increase from before the training (83% and 77%, respectively). Similarly large proportions expressed happiness with the computer hardware (the tablet) they took the training on (82%). Smaller majorities were happy with the other aspects of the training asked about. Noteworthy here is the bare majority (52%) who were happy with the speed of the software, suggesting an area for improvement.

Employees were also asked in the post-workshop platform survey about their motivation and confidence **during** the training and how much they liked the training overall. Once again, participants were asked to respond on a 10-point scale, ranging from 1=not at all comfortable, motivated, confident, or satisfied, up to 10=very comfortable, motivated, confident, or satisfied, depending on the questions. To these questions, most of which were asked at end just of Workshops 2 and 3, there were often too few responses to produce reliable results, particularly Workshop 3 where there were typically 8 responses.

Figure 10 Satisfaction with aspects of the training model, post-training



Source: Employee post-training survey.

What can be said about Workshop 2 training is that **a majority of participants were favourably inclined toward the DES training in terms of confidence, motivation and confidence during the training and were overall satisfied with it and would recommend it**. The results are as follows:

- 79% were **motivated** during the training (68% were quite motivated and 11% were somewhat motivated) (Workshop 2, n=28 responses);
- 90% were **comfortable** during the training (61% were quite comfortable and 29% were somewhat comfortable) (Workshop 2, n=28);
- 93% were **confident** during the training (54% were quite confident and 39% were somewhat confident) (Workshop 2, n=28);
- 100% found it motivating to receive a **completion certificate** (55% found it quite motivating and 45% found it somewhat motivating) (n=18, Workshop 1) (21% and 31%, respectively for Workshop 2, n=13);
- 78% were **satisfied** with the training overall (46% were quite satisfied and 32% were somewhat satisfied) (Workshop 2, n=28); and
- 68% were likely to **recommend** the training overall (39% quite likely and 29% were somewhat likely) (Workshop 2, n=28).

Employee satisfaction with employer-provided elements

A majority of participants were happy with aspects of the training in their employer's hands. Almost 8 in 10 participants (79%) were somewhat or very happy with the support they got from the manager/supervisor in taking the training, three-quarters (75%) were happy with the room they took the training in, and 64% were happy with the Internet connection. **The lower ratings for the Internet connection may be attributed to the lack of broadband capacity in the rural and small town settings of the participating organizations.**

Employer views of the implementation: design and delivery

Employer satisfaction with aspects of platform

Satisfaction with elements of the training model and its implementation was fairly high among owners/manager. Employers were asked to rate their satisfaction on a 5-point scale ranging from 1=very dissatisfied to 5=very satisfied. As Table 20 (Column 1) indicates, mean satisfaction ratings were above the half-way mark (2.5) on the scale. Satisfaction was highest for the support of the Instructor and Guide (mean ratings of 4.4 and 4.3, respectively).The second highest satisfaction ratings for the assistance in recruiting employees, the self-directed nature of the training (**autonomy**), and the response of staff to the training (means in the 3.4-3.6 range). The lowest ratings were for the clarity of project information, the Skills Map, the data provision demands, the surveys, and amount of time that their staff spent training (means in the 3.0-3.1 mean). Column 2 shows that a minority of organizations were very or somewhat dissatisfied (rating of 1 or 2) with the various aspects of the model and its implementation.

Table 20 Employer satisfaction* with aspects of the training model, post-training

Aspect of training model	Mean satisfaction rating*	Number dissatisfied (1-2)*
The availability of information from the project	3.4	2
The clarity of information received about the project	3.1	3
The recruitment of organizations	3.4	1
The assistance in recruiting employees	3.6	1
The support of the Instructor	4.4	0
The support of the Guide	4.3	1
The Skills Map	3.1	1
The data provision demands	3.1	1
The surveys you filled out on the training platform	3.1	2

Aspect of training model	Mean satisfaction rating*	Number dissatisfied (1-2)*
The self-directed nature of the training (**Autonomy**)	3.6	1
The amount of time staff spent on the project	3.0	2
The response of staff to the training	3.6	3

Notes: n=7.

*Employers asked to rate their satisfaction with aspects of the DES training on a 5-point scale, ranging from 1=very dissatisfied to 5=very satisfied. N/A = question not asked in pre-training survey.

Source: Employer pre- and post-training surveys.

There were some interesting changes in employer satisfaction from before the training (not shown in the table). Before the training, employers were asked to rate their satisfaction with particular elements of the training. Comparison of these results to the post-training results revealed that satisfaction increased over the course of the training for Instructor support. Over the same period, however, there was a distinct decline satisfaction with the clarity of the program information. This suggests attention should be paid by CBDC Restigouche to determining why this decline occurred.

Most employers were happy with the functionalities of the training platform. They were asked to indicate how much they liked each functionality on a 10-point scale from 1=did not like it all, to 10=liked it a great deal. Column 1 of Table 14 presents high mean "happiness" ratings for each functionality and Columns 2 and 3 indicate that most employers liked each functionality a lot and almost no organization disliked a feature. **The fact that employers were quite satisfied with the ability to assign workshops to employees according to their needs suggests that employers were happy with the customizability of the platform.**

Table 21 Employer satisfaction* with functionalities of platform, post-training

Functionality of platform	Mean happiness rating*	Number who were happy (8-10)*	No. who were not happy (1-3)*
Managing organization's training program (Management of Training)	8.3	5	0
Assigning training workshops to employees based on their needs (Training Priorities) (**Customizability**)	7.9	4	0
Monitoring employee progress in training program (Reports)	8.0	4	0
Receiving and giving employees' their Certificate of Completion	7.7	5	1

Notes: n=7 organizations.

* Employers asked to report how happy they were with functionality on a 10-point scale, from 1=did not like it at all, to 10=liked it a great deal.

Source: Employer post-training survey.

Employer ease of use of management of organization section of platform

Generally speaking, owners/managers found various aspects of the Training Management section fairly easy to use. They were asked to rate their ease of use of a feature on a 10-point scale, from 1=not at all easy to use, up to 10=easy very easy to use. As Table 22 indicates, all features received mean ratings of at least 7.4 on the 10-point scale. The feature enabling assignment of workers to training workshops appeared to be the easiest to use, noting again that **this indicates attainment of a major customizability implementation objective of the project**. Another result not shown in the table indicates that three of the four employers answering the question needed help in using the Management of Training section of the platform. These results point to the need for better information to be provided to the person acting as training managers possibly in the form of how to video and/or a training manager instruction manual.

Table 22 Employer ease of use* with aspects of training management section

Aspect of training management section	Mean rating*	Number reporting: Easy to use (8-10), Difficult to use (1-3)*
Registration of organization	7.6	4, 0
New learner registration	7.6	4, 0
Printing of personalized Learning Plan and login information for employees	7.7	5, 0
Purchasing of workshops	7.4	3, 0
Assignment of learners to workshops (**Customizability**)	8.0	4, 0
Organization reports	7.4	4, 1
Skills Gains Map	7.4	4, 1

Notes: n=7 organizations.

*Employers rated ease of use on 10-point scale, from 1=not at all easy to 10=very easy to use.

Source: Employer post-training surveys.

Employers' recommendations for improvement and overall satisfaction

Employers made the following recommendations for improvement: technical support when they start using the platform (5 of the 8 organizations), better instructions for navigation (4 of the 8 organizations), and better description of purpose in each section (1 of 8).

Half the participating organizations were, on the whole, satisfied with the quality of the DES training platform. They were asked to rate their general satisfaction with the quality of the online training platform on a 10-point scale, from 1=not at all satisfied, up to 10=very satisfied.

Four organizations reported being satisfied (8-10 on scale) on the scale and only one reported that they were not at all satisfied with platform (<5 on scale).

Perceived fair fee for a workshop

Six of the seven owners/managers who answered the question said they would pay $50 or less for a workshop for an employee. The other organization said $51-100 would be a fair price.

Chapter 5: Outcomes linked with training effectiveness

Results in this chapter will be first presented for each of the outcomes related to training effectiveness, then according to the contextual variables potentially influencing those outcomes. Observe as well that baseline (pre-training) levels for many of these variables, particularly with effectiveness, were presented in the profile chapter (Chapter 3).

Basic outcome indicators linked with training effectiveness comprise the following:

1. Digital skills/proficiency and other skills and knowledge gains
2. ICT confidence/proficiency gains
3. Improved attitudes to education and training
4. Enhanced psycho-social indicators
5. Improved organizational performance

Main findings

DES and ICT outcomes

- **One of the primary overriding objectives of the training program, indeed, was met – to effectively enhance digital skills of participants.** Participants in the training program realized large DES gains, as measured by the platform and as self-reported by participants, who largely attributed their gains to the training. A substantial proportion experienced gains of over 20 percentage points in each learning step of each workshop.
- **Moreover, skills gains were greater for those with at the lower end of the literacy skills spectrum than those at higher levels, thus addressing the expressed intention for the program to meet the needs of lower-literacy workers.** On the one hand, this could be due to the fact that the program was geared to lower-skilled workers. On the other hand, this could be attributed to the fact that lower-skilled individuals had more room for improvement and so would be expected to gain more – both absolutely and relatively – and they, in fact, did.
- **Skills gains were similar between those in manufacturing and those in other sectors, thus suggesting the training program would be applicable broadly beyond the manufacturing sector.** Much of the training content was contextualized to the manufacturing, so it was important to ensure that the training would be effective on other sectors. Indeed, there were no significant differences in skills gains between participants in the manufacturing and other sectors.
- **There were positive ICT outcomes for a significant proportion of training participants, thus fulfilling another major objective of the program.** The proportion of participants who said that they were good with ICTs and that ICTs were a big part of their job grew greatly over the course of the training, from 59% to 70%. Employers corroborate the employees' views in

regards to improvements in ICT proficiency since the training began, attributing this to the DES training.

Other measures of effectiveness

- **There were few changes from before the training to after it in more intermediate outcome indicators that research has shown are often the product of training and can lead to even greater outcomes down the road.** To some extent, this may be attributed to the relatively low dosage (up to 18 minutes per workshop/skill, with a maximum of two hours of actual training for a participant) delivered and to the fact that surveys took place too soon after the training to enable detection of outcomes that typically take some time to manifest themselves.
- **Employees' positive attitudes to education and training remained very much the same at high levels over the course of the training.** However, there was a modest decline in the perceived value of education and training relative to effort, which may be attributed to the training itself making individuals more aware of what it takes to increase skills and get ahead. On the other hand, employers believed that the training contributed to improvement in their employees' and their own attitudes to education and training.
- **Participants continued to be quite satisfied with qualitative aspects at work, but there was some evidence of declines in perceptions of job control.** On the other hand, there is evidence that participants were less likely to procrastinate after the training. As for self-actualization outcomes, there is some evidence of declines in this area, epitomized by declining desire for self-improvement. Again, this may be a question of the training opening participants' eyes as to what they do not know and what they need to get ahead. Self-efficacy levels retained their high levels from before the training. On the other hand, there was an increase in the future orientation of participants over the course of the training, suggesting the training increased participants' awareness of the value of looking ahead, which should serve well in the workforce going forward. Finally, there was negative change in participant's social networks over the course of the training.

The detailed results for each of the outcome indicators follow.

Digital skills and task proficiency

There were two main sources of data to measure digital skills gains, the first being the pre-/post-workshop assessment tests on the training platform, the second being the results from the pre-/post-training surveys conducted for this pilot with employees and employers. Each is discussed in turn. Note again that simply comparing post-training levels to pre-training levels is not necessarily a measure of the gains from the training, as other factors not accounted for could have contributed to the observed changes. This is the reason that, in some cases, we explicitly asked the respondent if the change observed would have occurred in the absence of the training, i.e., the simulated counterfactual.

Digital skills gains – platform assessment tests

At the beginning of each of the three steps of each workshop, participants were asked a series of questions to assess their capabilities in the learning area of the particular step. Those who reported 100% on this self-evaluation test were then subjected to a follow-up confirmatory test (or challenge assessment) and if they were found to still be at 100%, they were moved on to the next step of the workshop (or the next workshop if this was the third and final step of the workshop). Those who scored less than 100% on the challenge assessment and those who had scored less than 100% on the self-evaluation then were moved onto the training for that step. At the end of the learning step, participants were then subjected to the same challenge assessment test (post-training). The results presented are the differences in scores from the pre-training and post-training assessment tests.

The results presented in Table 23 indicate that **participants in the online digital skills training program realized large skills gains,** which are also statistically significant**.** This suggests that a primary of the objective has been met. Mean gains of 34-37 percentage points ranging across the three workshops delivered as part of the pilot were experienced by those taking all tests and steps of a workshop (last row of each workshop set of results).

The content of learning steps also was supposed to rise in complexity with each step, so one might expect a decline in scores across the steps within workshop. This is indeed the case in Workshop 3 (completing digital forms and business transactions), but not so in Workshop 1 (communicating electronically). It is quite the opposite pattern in Workshop 2 (consulting and using digital/online information/databases), where mean gains rose from 16 to 57 percentage points. This suggests that thought be given as to why there was such a variation in skills gains across the learning steps of Workshop 2.

Table 23 Digital skills gains: means of differences in pre/post-training scores, by learning step and workshop/digital skill

Skill and learning step	Mean skills gain* (percentage points)	Number taking tests
Workshop 1: Communicating electronically with co-workers, suppliers and clients		
Learning step 1	32.5	62
Learning step 2	43.1	55
Learning step 3	36.3	49
Mean gain for those taking all steps and tests	35.0	48

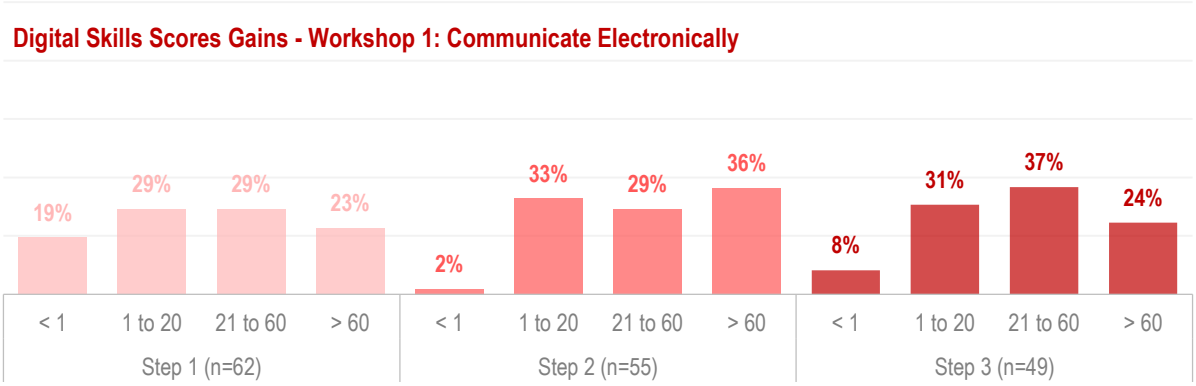
Skill and learning step	Mean skills gain* (percentage points)	Number taking tests
Workshop 2: Consulting/reading and using digital documents by accessing the Internet and databases		
Learning step 1	16.2	39
Learning step 2	29.4	37
Learning step 3	57.4	35
Mean gain for those taking all steps and tests	34.0	32
Workshop 3: Completing digital forms and commercial transactions on the Internet		
Learning step 1	44.0	23
Learning step 2	37.2	17
Learning step 3	36.0	15
Mean gain for those taking all steps and test	36.9	13

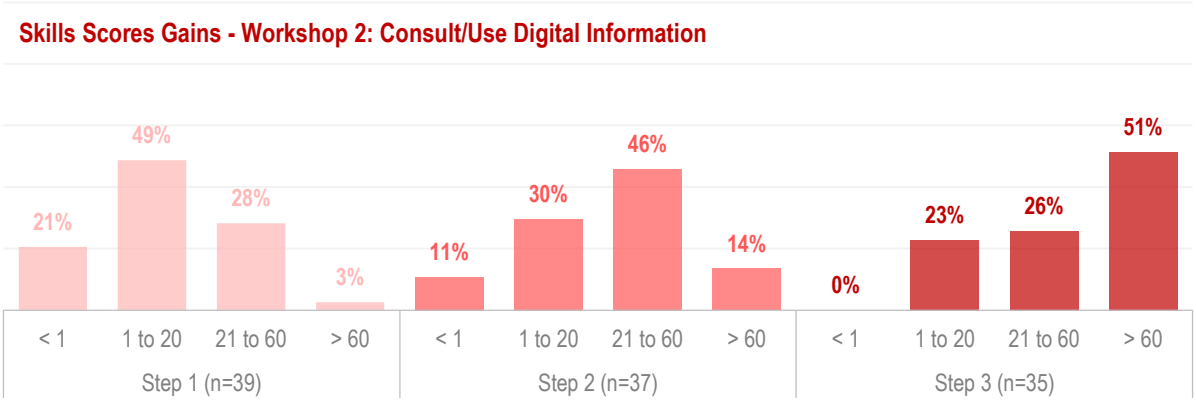
Notes: *All gains are statistically significant.

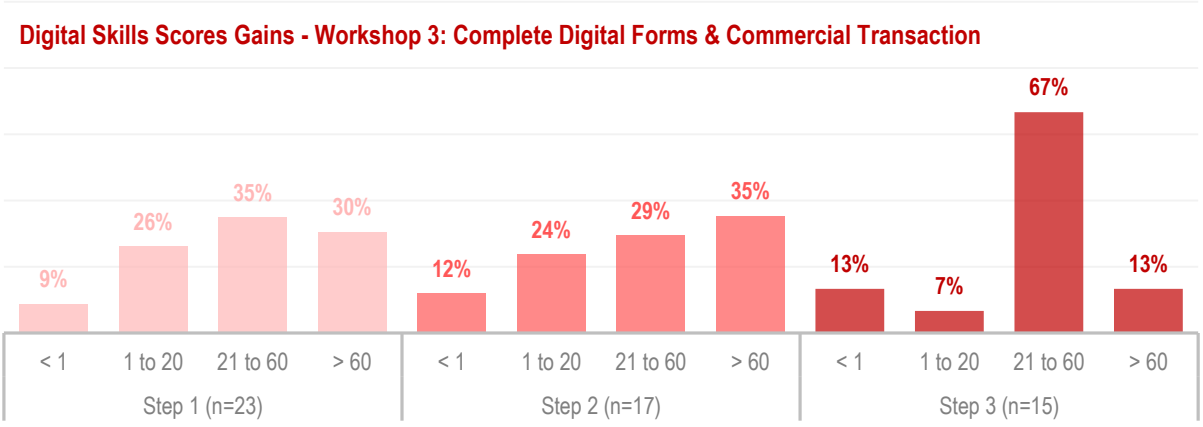
Source: Platform pre/post workshop assessment tests.

Figure 11 provides a pictorial look at the skills gains distributions across the learning steps of each workshop. The results show that majorities of participants (over half of them) experienced gains of over 20 percentage points in each learning step of each workshop, except the first one of Workshop 2. For example, in step 2 of Workshop 1, about two-thirds (65%) of participants gained in excess of 20 percentage points, in step 3 of Workshop 2, over three quarters (77%) gained over 20 points, and in step 1 of Workshop 3, over two-thirds (65%) gained over 20 points. In learning step 1 of Workshop 2, just 31% of the participants gained over 20 points, which goes hand in hand with the finding from above that the mean gains in this step were by far the lowest. Also note the very low proportions realizing gains of less than one point. The exception is in step 1 in Workshop 1, where about a fifth (21%) gained less than a point, which may be due to the novelty of and unfamiliarity with the online system at that point for participants.

Figure 11 Digital essential skills score gains – from the platform assessment tests



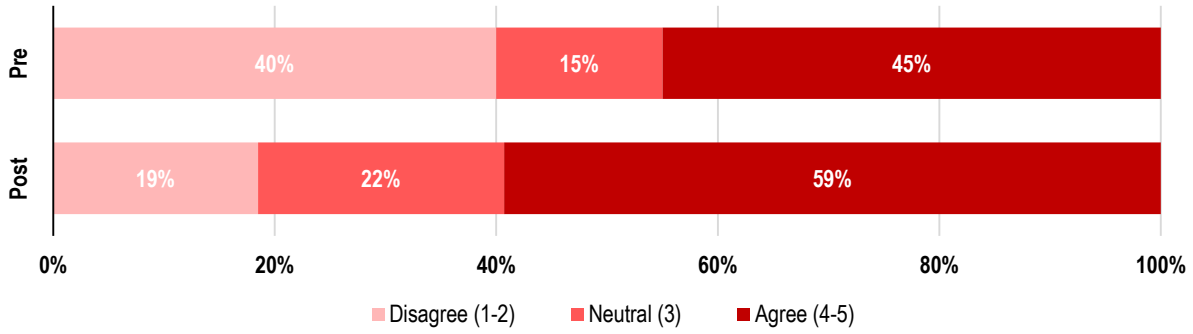




Self-reported DES gains – from research surveys

Self-reported skills results support the findings that participants appeared to have enhanced their digital skills. Questions in the employee pre- and post-training research surveys on self-reported digital skills were asked in a battery of questions on ICTs (The full ICT results are presented in the next section.) Training participants were asked before and after the training to indicate the extent to which they agreed, using the 5-point agreement scale, with the statement: "I have the digital skills to do my job well." A comparison of the responses from before and after the training (Figure 12) indicates a large one-third increase in the proportion of participants who agreed strongly or somewhat with the statement, from 45% to 59%, which was found to be statistically significant. This strongly suggests that the digital skills training provided by the online training platform met one of its primary objectives – to enhance digital skills.

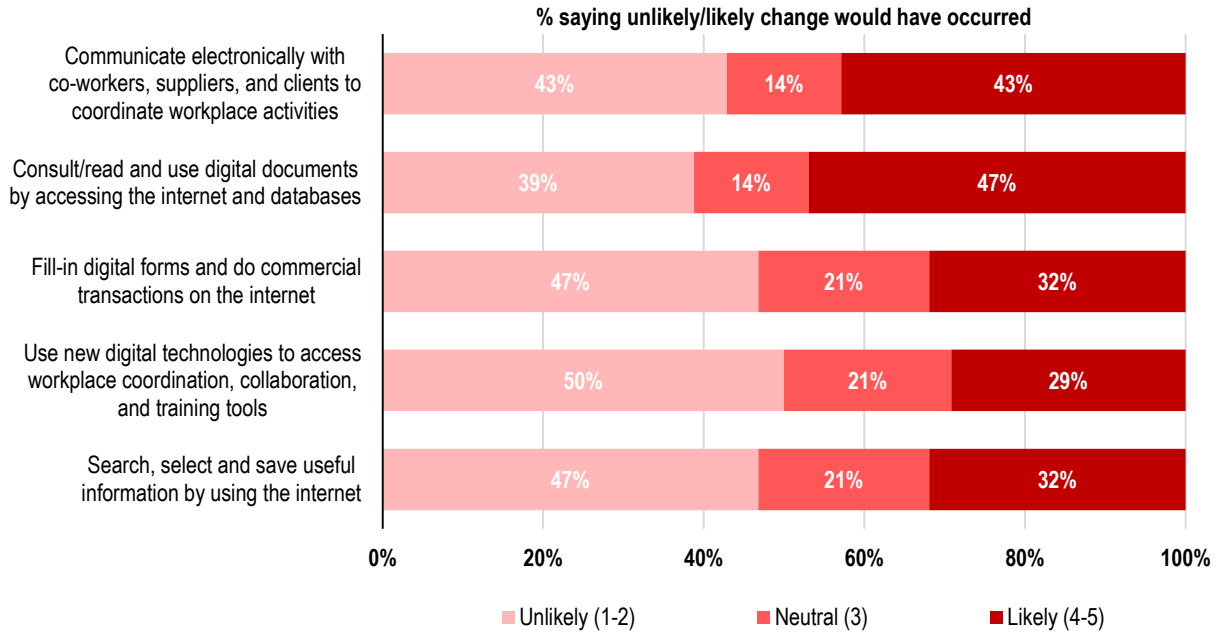
Figure 12 Participants' view of their digital skills, pre- and post-training (agreement with the statement: "I have the digital skills to do the job well")



Source: Employee pre- and post-training surveys.

Sizeable proportions of participants felt the digital skills training had a role to play in their skills gains. Further evidence from the research surveys on digital skills gains can be drawn from questions asking employees if they feel any improvement in their five digital tasks since the training would have happened without the training (i.e., the "simulated counterfactual"). They were asked how likely the changes would have occurred without the training, using a 5-point scale, ranging from 1=very unlikely to 5=very likely. The results presented in Figure 13 indicate that sizeable proportions (39%-50%) of participants felt that it was unlikely that changes in digital skill levels they experienced would have occurred without the digital skills training, i.e., that the training did play a role in the skills gains.

Figure 13 Digital skills: perceived likelihood change would have occurred without the training



Note: In the pilot, training was provided for just the first three digital skills.

Source: Employee post-training survey.

Employers similarly were asked if they felt any improvement would have happened without the training. First, they were asked if they had observed any improvement in digital skills of their employees since the DES training began, where improvement was rated on a 4-point scale where 1=no, 2=slight, 3=some, and 4=big. Then, employers who had experienced at least slight improvement (reporting greater than 1 on the improvement scale) were asked to rate the likelihood of the change occurring without the DES training on a 5-point likelihood scale in the same way as employees were above. These questions were asked digital skill by digital and occupation by occupation (administrative, operations, production, and client service). The results presented in Table 17 are shown by digital skill aggregated across the occupations, noting that not all occupations existed in all organizations.

The results indicate that the majority of employers observed improvement in digital skills since the DES training began and most of them attributed this to the training. Column 1 of Table 17 indicates average rated improvement at about 2.5 on the 4-point scale, in other words, slight to some improvement on average across the individual skills. Column 2 confirms this finding, as it indicates that most employers reported at least slight improvement, i.e., gave a rating of 2 or higher. The third column indicates that most of those who observed improvement believed that the training was the reason for it, i.e., they said it was very or somewhat unlikely (1 or 2 on the likelihood scale) that it would have occurred without the training.

Table 24 Digital Essential Skills (DES): employers' views on improvement in DES and role played by the DES training in the change

Digital skill	Mean improvement*	No. reporting at least slight improvement (>1)*	No. saying improvement unlikely without the training (1-2)**
Communicate electronically with co-workers, suppliers and clients to coordinate workplace activities (n=6)	2.6	6	4
Consult/read and use digital documents by accessing the internet and databases (n=7)	2.6	5	5
Fill-in digital forms and do commercial transactions on the internet (n=6)	2.7	5	4
Use new digital technologies to access workplace coordination, collaboration, and training tools (n=6)	2.5	5	4
Search, select and save useful information by using the internet (n=7)	2.7	6	4

Notes: n=7 respondents, but number varies by DES because not all occupations exist in all organizations.

*Employers asked to rate improvement since DES training began on a 4-point scale, ranging from 1=no improvement to 4=big improvement (averaged across the 5 skills). **Note that in the pilot, training was provided for only the first three of these digital skills.**

**Employers who experienced at least slight improvement (>1 on the scale) were asked to rate the likelihood improvement would have occurred without the training (counterfactual) on a 5-point scale, ranging from 1=very unlikely to 5=very likely (averaged across the 5 skills).

Source: Employer post-training survey.

Other self-reported skills and knowledge gains – platform post-workshop survey

The results from the platform post-workshop surveys indicate that **large proportions of participants feel that they acquired new skills and useful knowledge from the training.** In these surveys, employees were asked in two separate questions skills and knowledge gains from the training. They are asked to respond on a 10-point scale, ranging from 1=none/not at all, up to 10=a great deal. Across the first three workshops, a maximum of 83% said they acquired new skills from the training and 90% said the knowledge acquired from the training would be useful in the labour market. Specifically, across the first three workshops, about half (48%-50%) feel they have to a great extent (responding with 8-10) acquired new skills, and a quarter to a third (25%-33%) feels they have done so to some extent (responding with 5-7). Similarly, about half (50%-57%) feel that the knowledge gained from the workshops will be useful in the labour market, and about a fifth to third (21%-33%) feels it will to some extent.

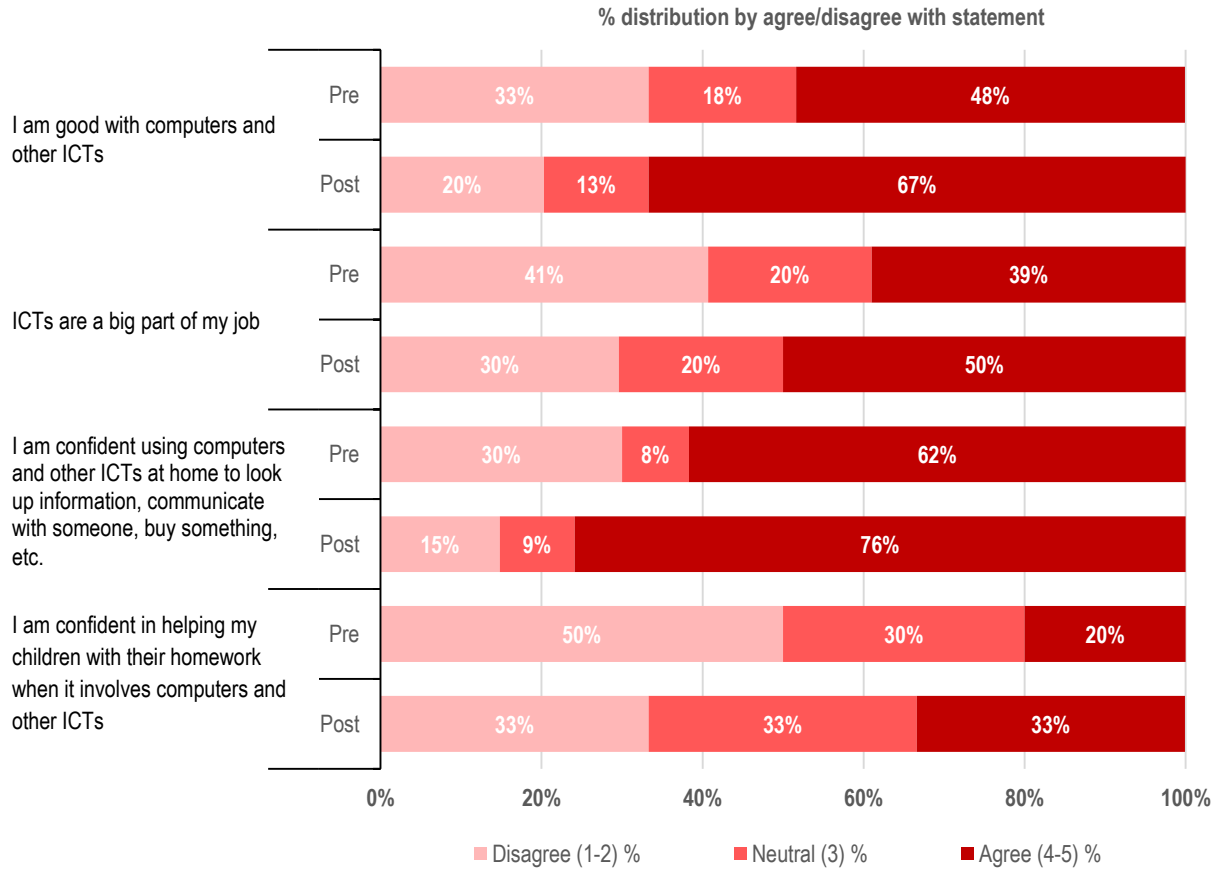
Information communications technologies: attitudes/practices

In this section, we examine attitudes and practices in regard to information communications technologies (ICTs) before and after the training, as well as employers' perceptions of effect of the training on these outcomes. An important secondary objective of the training is to increase employees' comfort with ICTs and their use of them. The expectation is that the training would make participants more amenable to the technologies and enable them to be more productive in using them.

ICT attitude/behaviour changes

There were positive ICT outcomes for training participants. Participants were asked to indicate whether or not they agreed with a series of statements on ICTs, using a 5-point agreement scale, ranging from strongly disagree (1), to neutral (3), to strongly agree (5). The results presented in Figure 14 indicate that the proportions who agreed with every statement rose a great deal from before the training to after it. The proportion who agreed that they were good with ICTs increased from 48% before the training to 67% after it, while the proportion who agreed they had the digital skills to do the job rose by a third, from 45% to 59%. Also, ICTs now appear to be a big part of more participants' jobs as the proportion who agreed they were rose from 39% to 50%. Finally, even in terms of ICTs at home, the proportion of participants agreeing with statements on the use of ICTs in searching for information at home and in helping with their children's homework rose greatly.

Figure 14 Information communications technologies attitudes/practices, pre-/post-training



Source: Employee pre- and post-training surveys.

Employer view of the training's effect on employees' ICT attitudes/behaviour

Employers also saw ICT improvements. Employers were asked to report any improvements they had observed in various ICT indicators since the DES training began. They were asked to respond on a 4-point scale ranging from 1=no improvement to 4=big improvement. As 0 indicates (column 2), few employers reported no improvement in the various ICT areas, i.e., reported a rating less than 2 (out of 4). Column 2 also indicates that the largest number of employers reporting some or big improvement was in regard to employee competence or proficiency in using ICTs on the job.

Employers experiencing at least slight improvement in each ICT indicator (reporting >1 on the 4-point improvement scale) were then asked to rate the likelihood the improvement would have occurred without the training, which is a rough approximation of the counterfactual. As Column 4 indicates, **most employers experiencing improvement attributed it to the DES training, i.e., they said it was unlikely the improvement would have occurred had there been no DES training.**

Finally, it should be pointed out that there were potentially useful question on ICT use at work and post-training ICT comfort. However, these questions were asked after only Workshop 3 and, as such, there only eight observations and therefore too few to present results from.

Table 25 Perceived effect of training on Information Communications Technologies (ICTs): employers' views

ICT measure	Mean improvement*	No. reporting at least a little (>1) & some or big improvement (3 or 4)*	No. saying improvement unlikely without the training (1-2)**
Level of acceptance of new ICTs in the workplace	2.3	5, 3	5 (n=5)
Level of confidence/comfort in using ICTs	2.6	6, 3	5 (n=6)
Level of competence/ proficiency in using ICTs	2.6	6, 4	5 (n=6)
Amount of time it takes to complete tasks using ICTs	2.1	5, 2	4 (n=5)
Level of overall use of ICTs	2.4	6, 3	5 (n=6)

Notes: n=7 for all measures.

*Employers asked to rate improvement since DES training began on a 4-point scale, ranging from 1=no improvement to 4=big improvement.

**Employers who experienced improvement since training began (2, 3 or 4 on the above scale) were asked to rate likelihood improvement would have occurred without the DES training (counterfactual) on a 5-point scale, ranging from 1=very unlikely to 5=very likely.

Source: Employer post-training survey.

Training and education attitudes

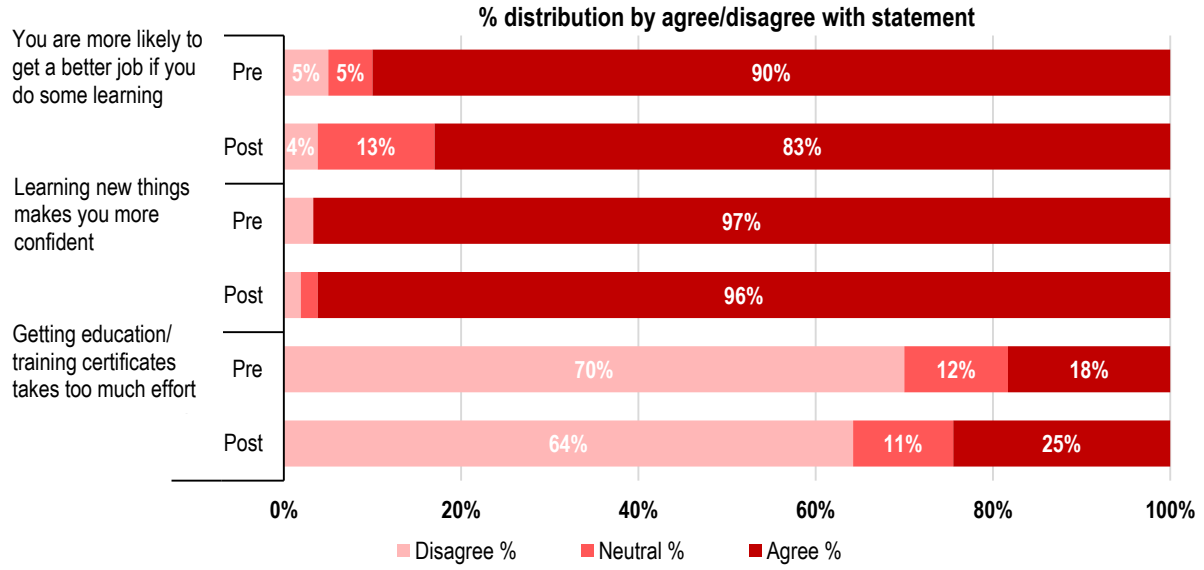
Another secondary objective of the training is that employee attitudes to training in general would improve as a result of the training, thus making them more amenable in the future to training that would further their workplace proficiency. Comparing pre- and post-training attitudes to training is a measure of the contribution of the digital skills training to these attitudes, but, as noted in Chapter 2, it is possible that factors other the training could have contributed to any changes observed. Results are also shown from the post-training survey of employers where they were asked if the training played a role in their attitude changes.

Employee views on training and education

There were few pre-/post-training differences in attitudes toward training and education. These were measured as the proportion agreeing with certain statements about education and training, using a 5-point scale, ranging 1=disagree strongly, to 3=neutral, to 5=strongly agree. It was

shown in the profile chapter (Chapter 2) that **employees were already positively inclined toward education and training generally, so we would not expect to see much growth** from the digital skills training. Indeed, Figure 15 shows that post-training education and training attitudes among employees are little different after the training from what they were before it. Continued large majorities agreed that one is more likely to get a better job by learning (83%, compared to 96% before the training) and that learning new things increases confidence (96% versus 97% before). A smaller, but similarly little changed, proportion disagreed that getting an education/training certificates takes too much effort (64% compared to 70% before).

Figure 15 Employees' attitudes to education & training, pre- and post-training



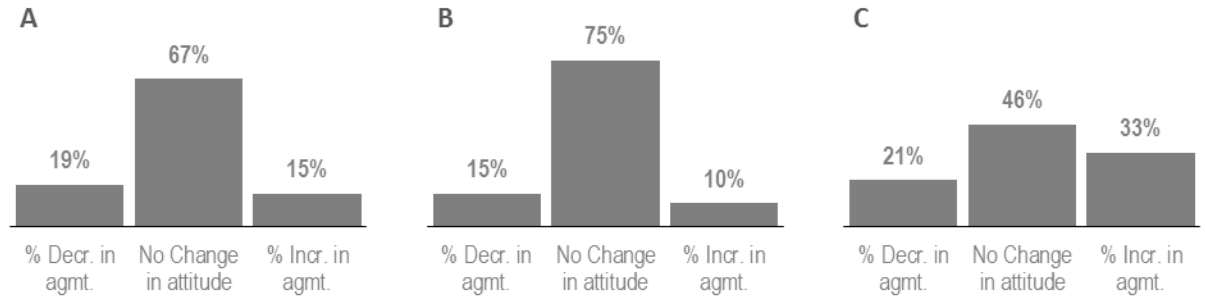
Source: Employee pre- and post-training surveys.

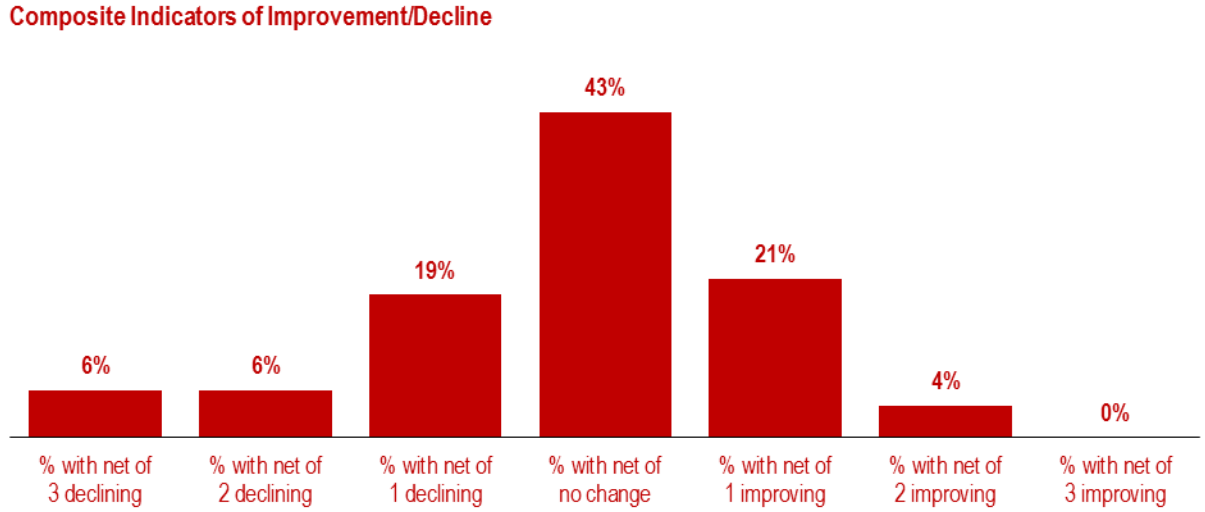
The preceding results were based on what is called **cross-sectional analysis**: simple differences between pre- and post-training proportions of all respondents in the respective surveys agreeing with the relevant statements. Technically speaking, these are not **changes** in proportions because different numbers of participants answered the question before and after the training. An alternative way of computing differences and a somewhat more precise way of measuring change is to conduct the **longitudinal analysis**: computing **paired** pre/post-training differences for only those who answered the question at both points in time. For each participant who did so, the pre/post-training difference in agreement rating was computed and the differences were aggregated into distributions to observe the following: what proportion of participants "increased" their agreement (moving from a lower to higher number on the scale), how many decreased (from a higher to lower number) and how many did not change their views (reporting the same number). Statistical tests of significance were applied to the differences between the proportion increasing and the proportion decreasing. Also, as a way of summarizing the results, a composite was computed of variables capturing similar concepts and a frequency distribution of the differences

was created. The results are presented in Figure 16 (and in tabular form in Appendix B) for each of the component education and training statements and for a composite of the three.

The longitudinal results confirm that **there was little change in employees' training and education attitudes over the course of the training**. For the component and composite measures, there is a concentration in the middle of the distribution – indicative of little or no change – with fairly balanced proportions between the lower (declines) and upper (increases) ends. In only one case (graph C: "getting educational certificates requires too much effort") is there a noticeably (though not significantly so) greater proportion in the upper end (33% increasing their agreement with the statement) than at the lower end (21% reducing their agreement), signifying an increased concern with the effort involved in getting an educational credential. Not surprisingly this is the same item where a decline was observed in the unpaired cross-sectional analysis above.

Figure 16 Changes in attitudes towards education and training (Longitudinal)





Notes:

A: You are more likely to get a better job if you do some learning.

B: Learning new things makes you more confident.

C: Getting education/certificates takes too much effort.

Source: Employee pre and post-training surveys.

Employer views of interest/participation in training and role of DES training

Owners/managers were asked to judge the effect of the DES training on their employees' and own attitude toward training, on a five-point scale ranging from 1=very negative to 5=very positive. The results in Table 19 indicate that four of the seven organizations answering the question felt that the **DES training has had a positive effect** (responding with 4 or 5 on the scale) on both employee interest/participation in and their own attitude toward training in general and digital skills training. The same can be said of the employers' view of their own attitude to training in general and digital skills training.

Table 26 Perceived effect of the DES training on employee interest/participation in training: employer views

Indicator	Mean rating*	Number of firms reporting Positive effect (4-5)*
Employee interest/ participation in …		
Training in general	3.7	4
Digital skills training	3.7	4
Employer attitude toward …		
Training in general	3.6	4
Digital skills training	3.7	4

Notes: n=7 organizations.

*Employers asked to rate the effect of the DES training on training participation/attitude on a 5-point scale, ranging from 1=very negative to 5=very positive.

Source: Employer post-training survey.

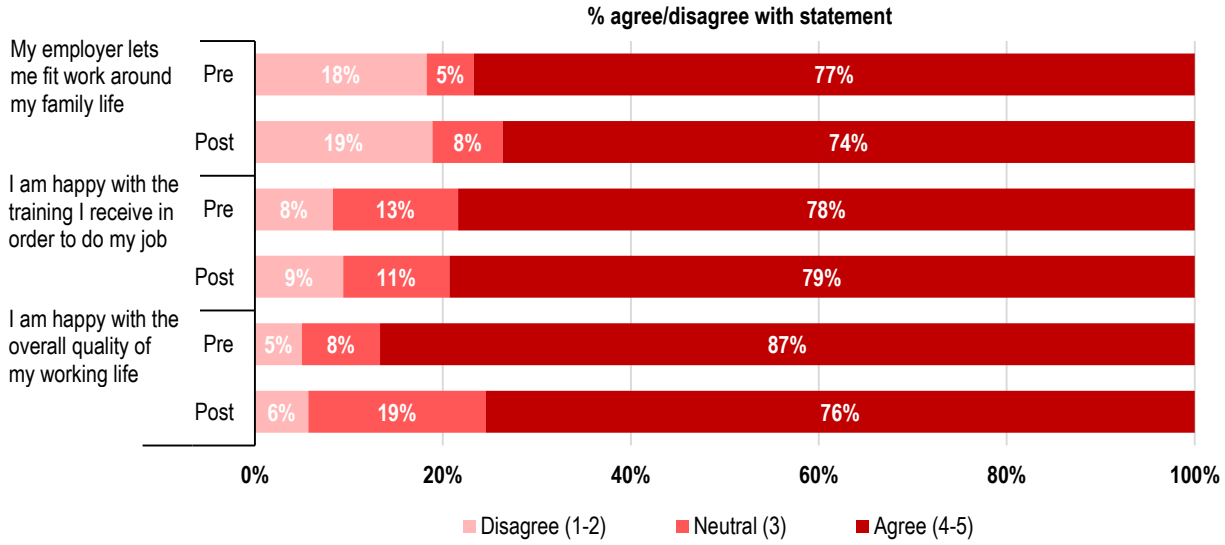
Psycho-social outcomes: changes in qualitative views on work and self

In research of this kind it is important to measure psycho-social outcomes of training such job control and confidence. It has been shown in past research that training can improve psychological aspects of the trainee, which in turn can **later** lead to greater engagement at work and improved productivity on the job. Most data for this section were gathered in the pre- and post-training surveys. All statements used to measure the different concepts have been used in prior research by SRDC and others. To measure the various concepts, survey respondents were asked to indicate whether or not they agreed with certain statements on a 5-point scale ranging from 1=strongly disagree to 5=strongly agree, with the midpoint 3=neutral. Results are typically presented in terms of the proportion agreeing, which combines the proportions agreeing strongly and somewhat (4 or 5 on the scale).

Qualitative aspects of work

There were few differences in employees' satisfaction with work over the course of the training, based on the cross-sectional analysis**.** Employees were asked to consider qualitative aspects of their work before and after the DES training, with a view to determining whether or not there had been changes in those views over the course of the training. The cross-sectional results presented in Figure 17 indicate that there were few differences in the distributions: similarly large proportions of participants before and after the training agreed that their workplace was family-friendly ("lets them fit work around family life") (77% vs. 74%) and that they were happy with the training provided at work (79% and 79%). The only result suggesting some movement is the proportion who agreed that the quality of their work life is high ("I am happy with the overall quality of my work life"), falling from about 88% who agreed with the statement to 78%.

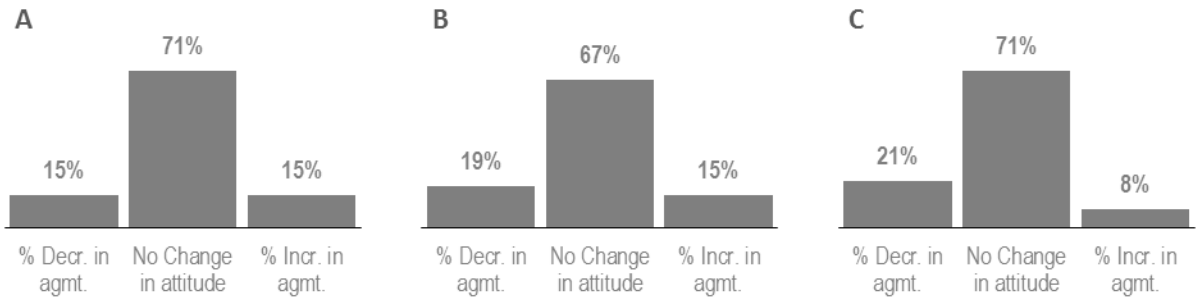
Figure 17 Satisfaction with aspects of work, pre- and post-training

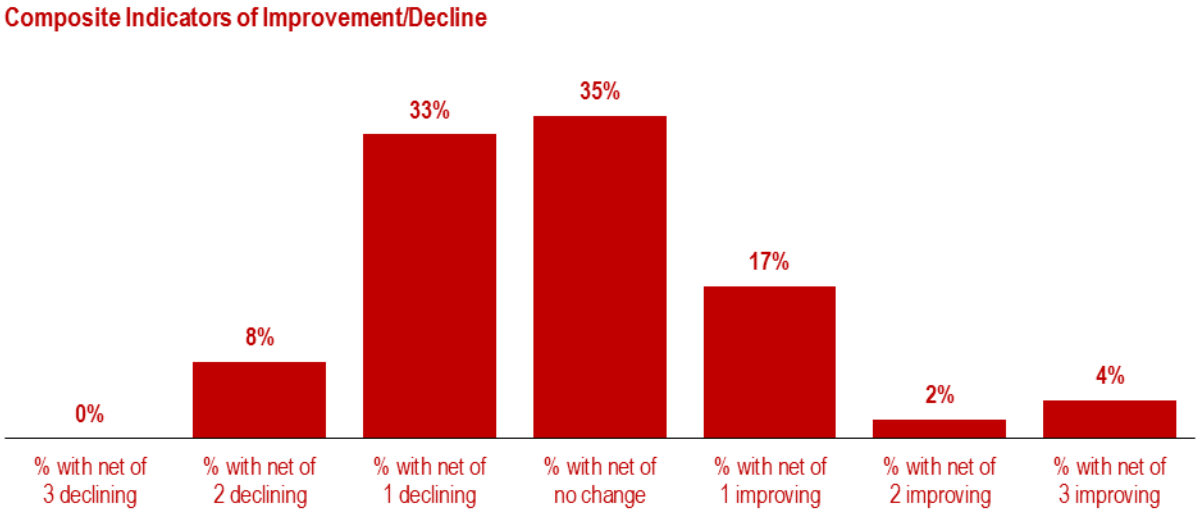


Source: Employee pre- and post-training surveys.

The longitudinal results based on paired differences yields a similar story of little change in employee satisfaction with work and employer supports. Again, the aggregate distribution of agreement changes (Figure 18 and in tabular form in Appendix B) reveals few changes in the component variables with large proportions (67%-71%) indicating no change and fairly balanced proportions at either end, though with respect to the third indicator (graph C: being happy with the quality of working life) the percentage increasing (21%) is somewhat greater than the percentage decreasing (8%). Moreover, with the respect to composite measure, there are somewhat greater proportions with declines in agreement than with increases: 33% and 8% falling by 1 and 2 points, respectively, compared to 17% and 2% rising by 1 and 2 points, respectively. This is suggestive of reduced satisfaction with work following training, but it is not significantly so in statistical terms.

Figure 18 Changes in quality of working life and employer supports (Longitudinal)





Notes:

A: My employer lets me fit work around my family life.

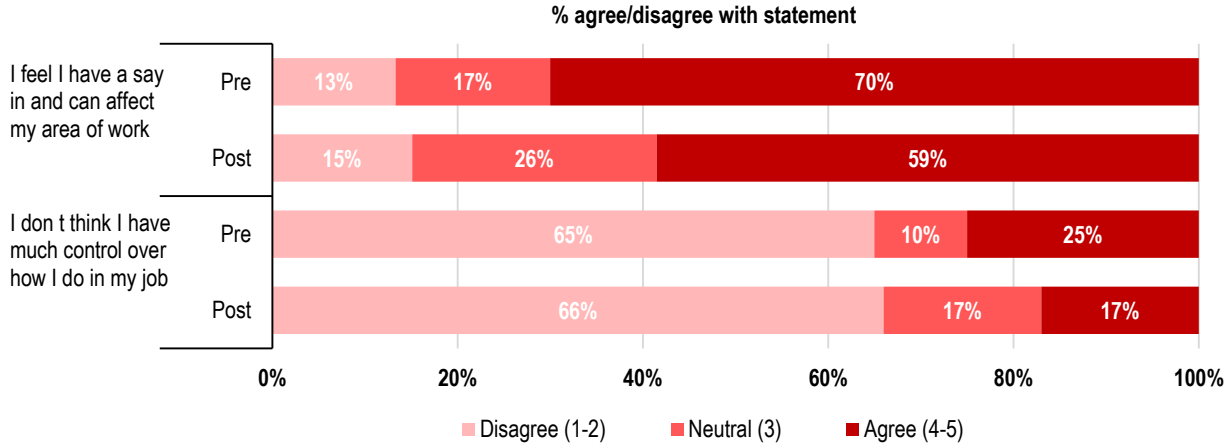
B: I am happy with the training I receive in order to do my job.

C: I am happy with the overall quality of my working life.

Source: Employee pre/post-training surveys.

With respect to job control, the cross-sectional analysis indicates a decline between before and after the training. There were two questions to measure this concept, the results of which are presented in Figure 19 (and in tabular form in Appendix B). The results indicate there was a fall in the proportion agreeing with the statement about "having a say and affecting my work" (from 70% to 59%) and with the proportion agreeing with the statement about "**not** having control over how I do my job" (from 25% to 17%).

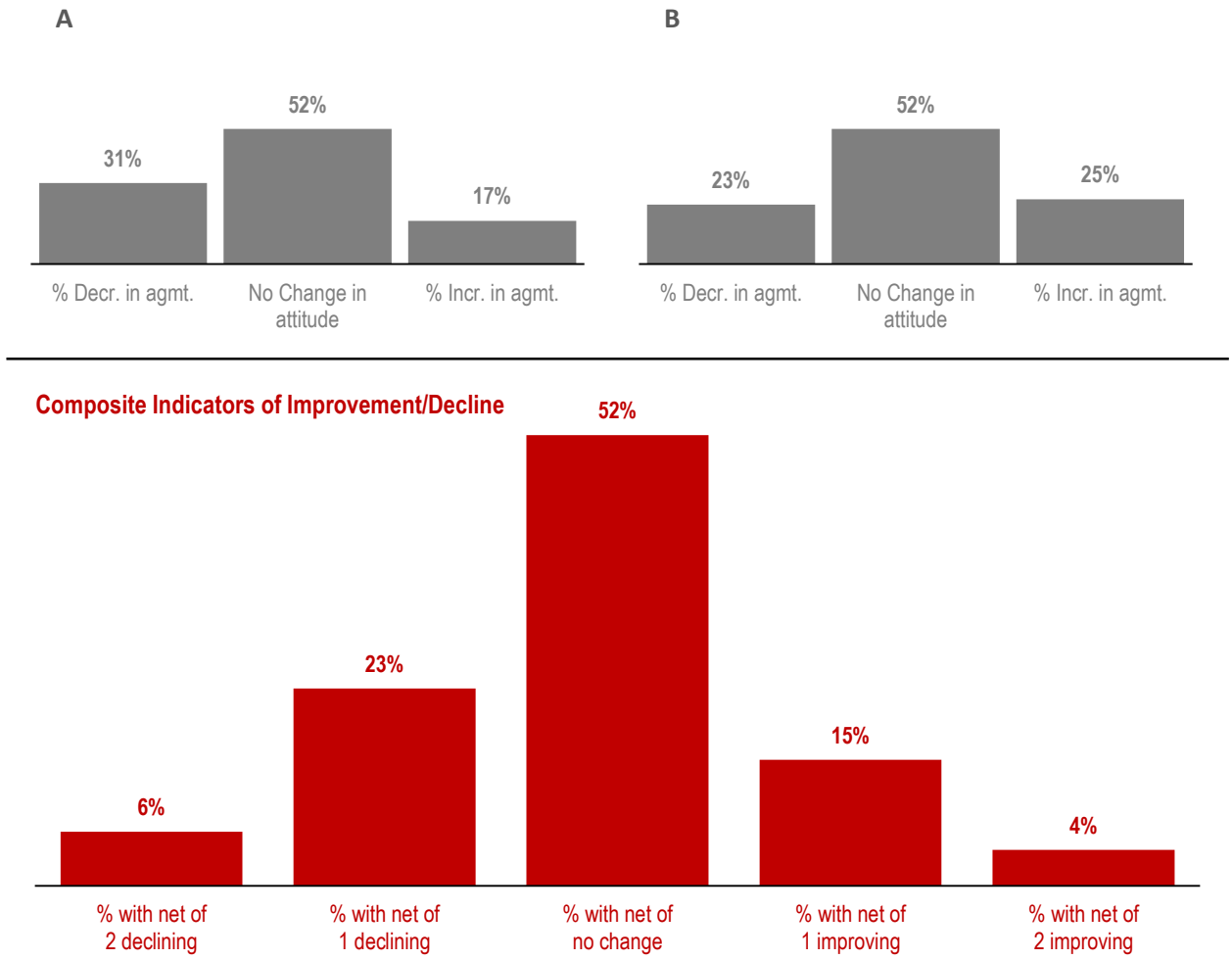
Figure 19 Degree of job control, pre- and post-training



Source: Employee pre/post-training surveys.

The longitudinal analysis little change in perceived job control over the course of the training. The results presented in Figure 20 (and in tabular form in Appendix B) indicate that in Graph A for the one of the component indicators and in the composite, the declines in agreement/improvement are only somewhat greater that the increases. For Graph B, changes are completely balanced, with declines almost the same as increases.

Figure 20 Changes in feelings of control over one's work and destiny (Longitudinal)



Notes:

A: I feel I have a say in and can affect my area of work.

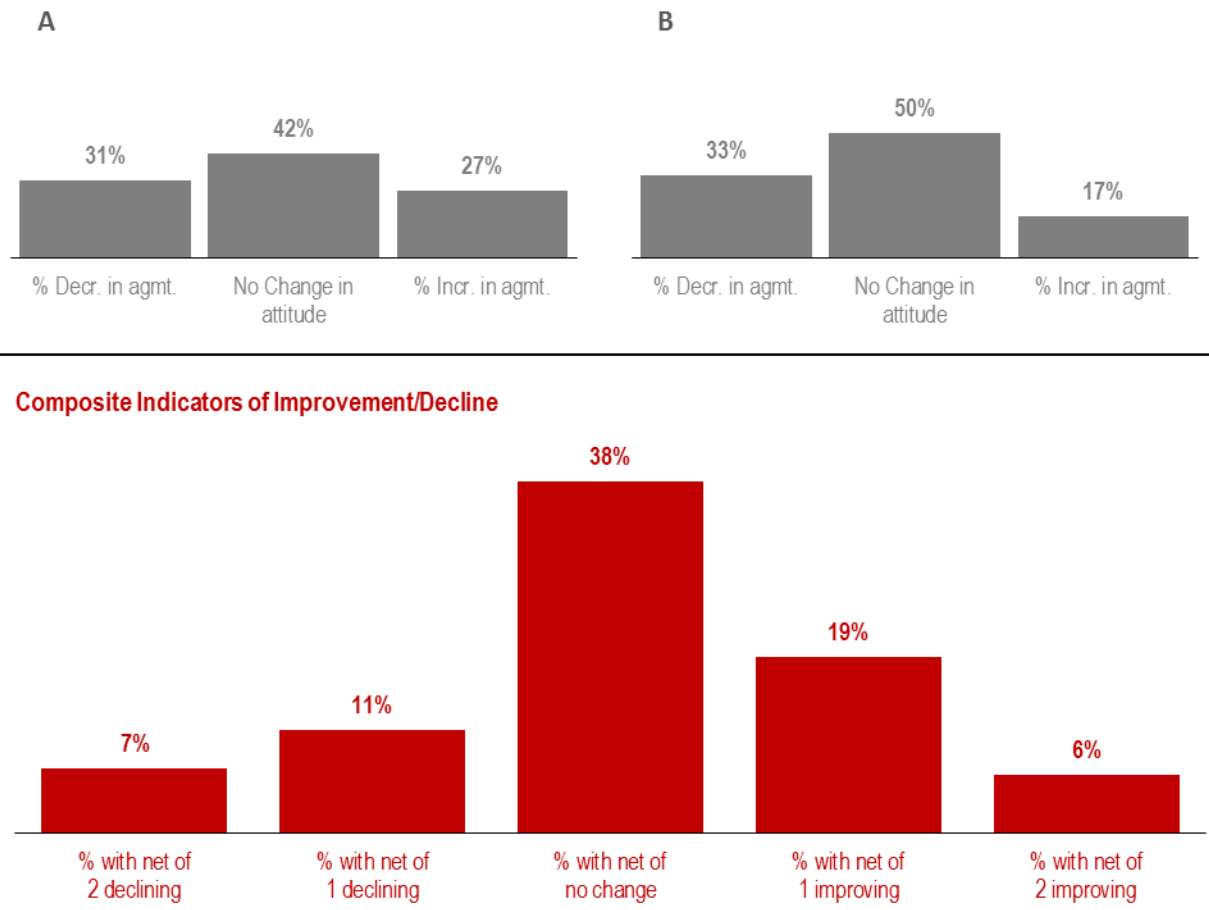
B: I don't think I have much control over how I do my job.

Source: Pre- and post-training employee surveys.

The cross-sectional results for job-related mental health suggest some reduction in procrastination at work but a slight increase in anxiety levels. First, the proportion agreeing with the statement measuring procrastination ("I find I sometimes do things (like putting things off) that may lower my chances of doing well in my job") fell from 85% to 77%. This latter result was found to be a statistically significant difference. On the other hand, the proportion agreeing with the statement "I get quite anxious in my job" rose a little from 35% before the training to 40% after the training.

The longitudinal paired comparisons **confirm the finding of little change in anxiety levels and a reduction in job procrastination among participants.** Figure 21 (and in tabular form in Appendix B) indicates that for both the composite indicator and the component indicator, the changes were positive. For Graph B, the proportion of participants decreasing their rating (33%) was significantly higher than the proportion increasing (17%), which indicates a positive change. For the composite, the proportion improving (25%) was significantly greater the proportion reducing it (18%). For Graph B, the changes were small.

Figure 21 Changes in work-related stress and procrastination (Longitudinal)



Notes:

A: I get quite anxious in my job.

B: I find I sometimes do things (e.g., waste time, not try hard, put off things till tomorrow) that may lower my chances of doing well in my job.

Source: Employee pre- and post-training surveys.

Psychological outcomes: self-actualization and self-efficacy

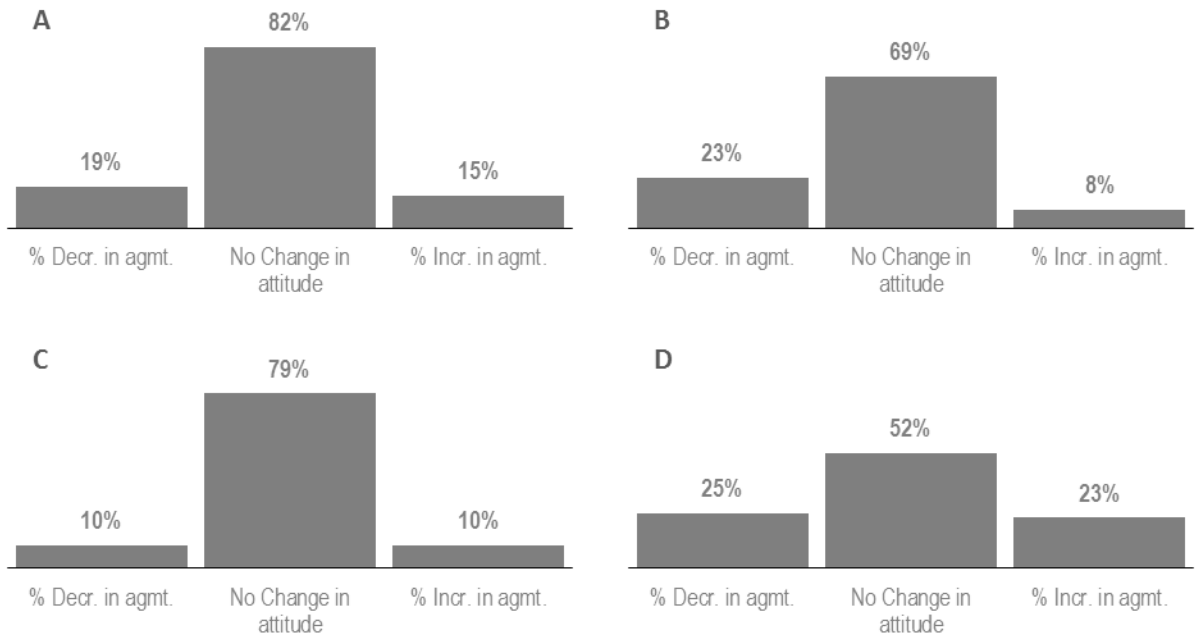
The cross-sectional results suggest that **there were few results in the psychological aspects of the individual in regard to their job**. In fact, the results revealed a number of modest negative changes in all but one indicator over the course of the training, though in only one case is the result statistically significant. **This may have resulted from the DES training "opening employees' eyes" with respect to their needs and gaps.** Moreover, it may well be that more substantial and positive changes may manifest themselves down the road, as such changes typically occur over time and that the survey took place soon after the training.

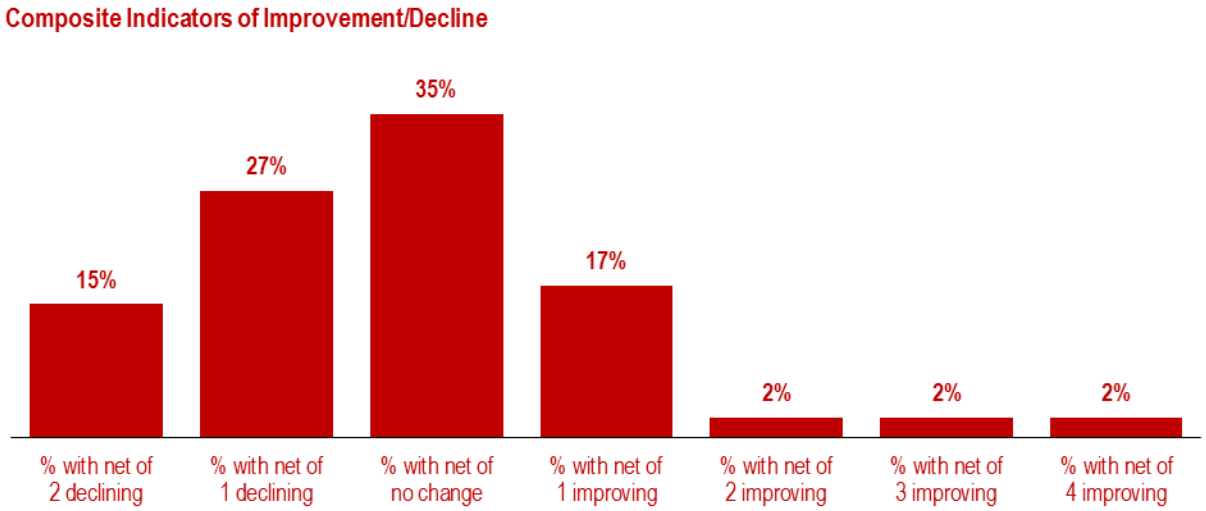
- **Self-actualization/esteem:**
  - Regarding **self-rated proficiency and importance**, there was little pre/post-training difference in the proportions agreeing with statements measuring self-actualization ("I do a good job" (97% to 96%) and "What I do at work is useful/important" (95% to 93%)).
  - There was little difference in **self-confidence/esteem** level of participants: the proportion agreeing with the statement "I have high self-esteem at work" fell somewhat from 80% to 72% after the training.
  - In terms of **focus on self-improvement** ("In my job I'm more focused on learning and improvement than competing and being the best"), there was a statistically significant negative difference in the proportion agreeing with the statement (80% to 72% after the training).
- **Self-efficacy/skills:**
  - For **time/organization skills**, little difference was observed. For both statements capturing these skills ("I try to plan out the things I have to do in my job" and "I use my time well and organize my work area so that I can work under the best conditions"), proportions agreeing were similar before and after the training (86 to 89%; 93% to 92%).
  - For **persistence**, the proportion agreeing with the statement capturing this concept ("I stick with my job even when it is challenging or difficult") fell slightly from 97% to 94%.

As the results below will show, longitudinal analysis of paired differences (based on those with responses in both the pre and post training surveys) revealed that many of the psychological outcomes changes in fact were statistically significant but positive. For this analysis the above psychological outcomes were divided into two groups, as they are grouped above: one measuring self-actualization/esteem, the other measuring self-efficacy/skills.

With respect to self-actualization/esteem, the longitudinal results confirm little change, apart from a decline in the self-improvement indicator. Figure 22 (and the respective Table in Appendix B) indicates that, for component indicator B (focus on learning and improving oneself), the proportion of participants reducing their agreement with the statement (23%) is significantly greater than the proportion increasing it (8%). For all other component indicators (Graphs A, C and D), the differences between those increasing and reducing the proportions were small. For the composite, while there is a skewing downward in the distribution (more declining than increasing) over the course of the training, these changes are not significant.

Figure 22 Changes in job attitudes: self-actualization and esteem (Longitudinal)





Notes:

A: Overall, I feel I do a good job.

*B: In my job, I'm more focused on learning and getting better than on competing and being the best.

C: I feel that what I do at work is important and useful.

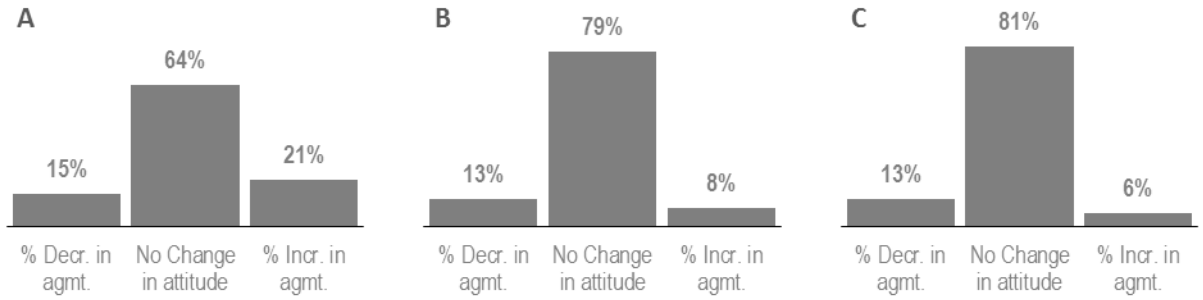
D: I see myself at work as someone who has high self-esteem.

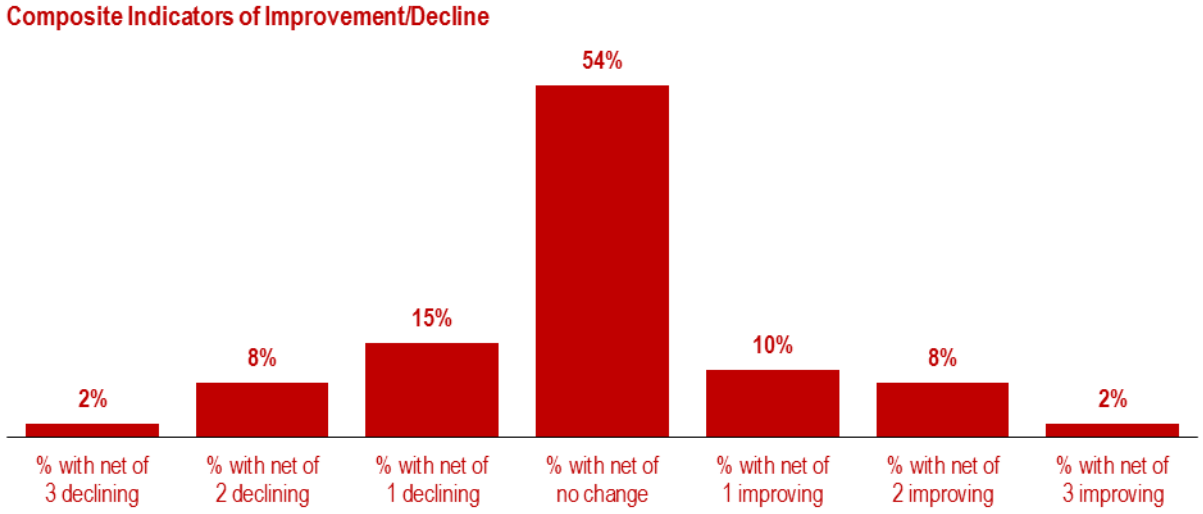
*Statistically significant change.

Source: Employee pre- and post-training surveys.

Few changes were also found from the longitudinal analysis for self-efficacy/skills outcomes. Figure 23 (and the respective table in Appendix B) indicates that for the three component indicators and the composite of these three, the proportions of participants who increased their ratings were similar to the proportions decreasing it, with only slightly more lowering their ratings than increasing them in the composite.

Figure 23 Changes in job attitudes: self-efficacy with skills (Longitudinal)





Notes:

A: I try to plan out the things I have to do in my job.

B: In my job, I use my time well and organize my work area so that I can work under the best conditions.

C: I stick with my job even when it is challenging or difficult.

Source: Employee pre- and post-training surveys.

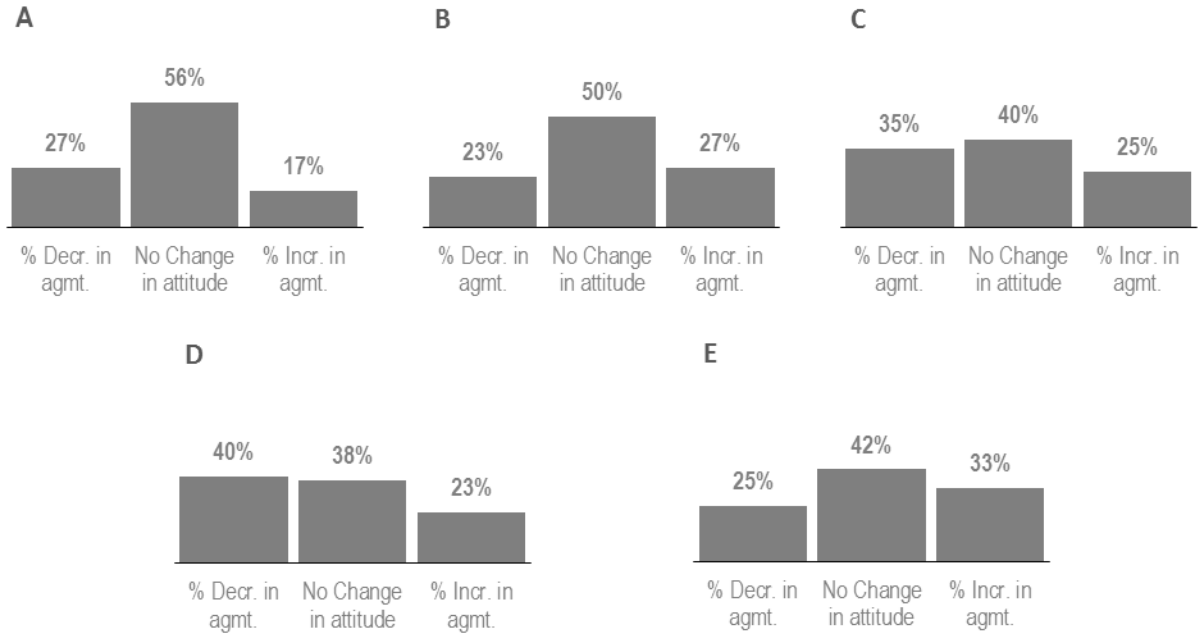
Future orientation

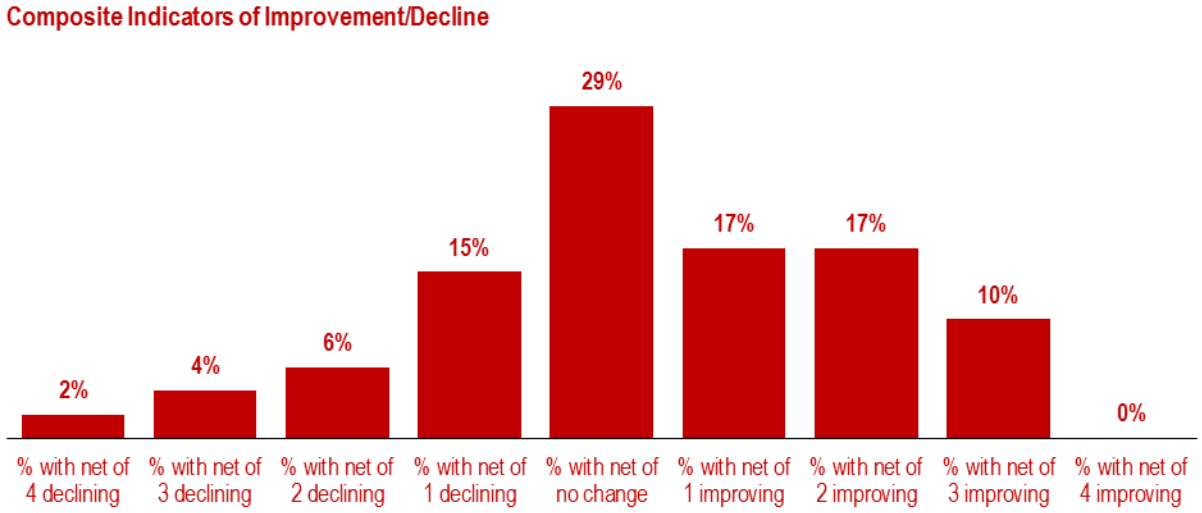
Another related expected psychological outcome of training is an enhanced future orientation. Our past research has shown that training can help make participants more forward looking, since training itself can be viewed as an investment in the future. To measure future orientation and changes in it, we asked respondents to indicate whether or not they agree with five statements that we, and others, have used in past research.

The results indicate that **there is some evidence of a rise in future orientation among participants.** There was little change in the proportions agreeing with four of the five statements measuring future orientation. The one exception is: "Generally, I am focused more on what is going on now than on what will happen in the future" with which the proportions agreeing strongly or somewhat fell from 63% before the training to 59% after it, indicating some improvement in terms of being less likely to focus on the present. While the difference between pre- and post-training levels do not seem large, it is statistically significant, suggesting some increase in future orientation over the course of the training.

Once again, longitudinal analysis was conducted and the results confirm an increase in future orientation. It is observed in Figure 24 (and the respective table in Appendix B) that there is a shift upward in the distribution of agreement ratings. For the composite indicator, observe that, outside the 29% who did not change their view, 44% (17=17+10) increased their agreement, while 25% (2=4=6+15) reduced it. This is suggestive of increased future orientation, though the change is not statistically significant, nor are the changes in four of the five individual components. The one exception where the difference is statistically significant, already noted above in the cross-sectional analysis, is a positive change in agreement with the statement about focusing on the present: 35% reduced their rating compared to 25% who increased, which is indicative of a positive change).

Figure 24 Changes in attitudes: future orientation (Longitudinal)





Notes:

A: I make decisions on the spur of the moment (with little thought).

B: Meeting tomorrow's deadlines and doing other necessary work come before tonight's "play" (e.g., before recreation or relaxation).

*C: Generally, I am focused more on what is going on now than on what will happen in the future.

D: Since "Whatever will be, will be," it doesn't really matter what I do (i.e., I can't affect the future).

E: You can't really plan for the future because things change so much.

*Change in agreement is statistically significant.

Source: Employee pre- and post-training surveys.

Social engagement/networks

There was a negative difference in the proportion of participants who were members of groups. It was hypothesized, and past research has demonstrated, that participation in training can lead to increased social interaction among participants, which in turn can increase their proficiency at work by enabling them to work more cooperatively with their colleagues and clients. To measure social interaction, employees were asked if they took part in any groups such as a social committee, health and safety committee, employee-management committee, union committee or charity funds-raising committee. It was shown above that, pre-training, a minority of employees participated in these groups at work. The post-training results revealed that this proportion actually fell somewhat from 40% to 37%.

The longitudinal analysis reveals a modest decline in social networks among participants. The results in Figure 25 (and in the social networks table in Appendix B) reveal greater proportions of participants reporting declines than those indicating increases. For example, in Graph B, the proportion who indicated a smaller social network size (i.e., who knew fewer of those in their social groups) was 37.8% compared to the 6% of those whose network increased in size. This is also revealed in the composite of the two social engagement/network indicators, which shows a noticeable skew to the lower end of the distribution.

Life satisfaction

The training does not appear to have affected life satisfaction much, if at all. Past research has shown that training can contribute positively to life satisfaction, but this does not appear to be the case, which is not surprising given the short timeframe of the measurement and the small amount of training delivered. Life satisfaction was measured by a 10-point scale used in the literature to measure overall life satisfaction, which can be affected by the training but does not appear to have been in this case, owing to the relatively small amount of training and the short period of time after which satisfaction was measured by the survey. A little over half the participants (55%) reported being quite happy (8-10) on the scale, which is somewhat lower than the proportion before the training (66%), which suggests some decline in happiness over the course of the training. After the training, about 38% were moderately happy, and just 8% were unhappy. Mean satisfaction ratings fell from 8.1 after the training, to 7.8 after the training.

Organizational performance

In training research, analysts typically measure the impact of training on organizational performance. It is expected that training, by enhancing the skills and then the proficiency of individuals in the workplace, will ultimately, over a longer period of time, improve the performance of the entire organization in such areas as productivity, sales, and customer satisfaction. However, as we have noted above, we do not expect to see much change in these measures over the course of the training, given its short timeframe (2-4 months in a given business) and the fact that measurement of outcomes took place very soon after the training was complete.

Few employers felt that gains in organizational performance since the training began were due to the training. Employers were asked to report observed changes in organizational performance measures since the training began, on a 7-point scale, ranging from 1=much worse to 7=much better. Typically, few saw an improvement since the training, except in the area of human resources, particularly and interestingly in regard to staff development (training) but also in regard to capacity for change and employee confidence, morale and engagement. We then asked employers with positive change since the training (reporting 5-7) to rate the likelihood the improvement would have occurred without the training, using a 5-point scale ranging from 1=very unlikely to 5=very likely (the simulated counterfactual). However, as the numbers in the brackets of Column 2 of Table 27 indicate, a limited number of employers felt that the improvement was due to the training, i.e., the counterfactual: few thought it was unlikely that the improvement would have occurred without the training.

Table 27 Organizational performance: number of employers reporting improvement since the training began, and perceived likelihood improved performance would have occurred without the training

Performance indicator	No. reporting improvement (>4) since training began	No. saying improvement unlikely (1-2) without the training
Productivity and costs		
Sales revenue	2	1
Productivity/efficiency: time to complete a task	1	1
Errors on job: in making a product or providing a service	3	2
Cost-control, wastage: unused or misused supplies	1	0
Health and safety		
Absenteeism: days off work	1	0
Employee turnover: employees leaving the organization	3	0
Workplace safety: injuries on the job	1	0
Product/service provision		
Product or service quality	1	1
Communications/relations with customers and suppliers	2	1
Customer satisfaction	3	1

Performance indicator	No. reporting improvement (>4) since training began	No. saying improvement unlikely (1-2) without the training
Human resources		
Inter-employee relations/communications	3	0
Staff development ; training provision/participation	5	1
Organizational capacity for change	4	1
Employee satisfaction/morale	4	1
Employee-management/supervisor relations	3	1
p. Employee confidence	4	2
q. Employee engagement/involvement & sense of belonging	4	0

Notes: n=7. *Employers asked to rate organizational performance since the training began, on a 7-point scale, where 1=got much more to 7=got much better.

**Employers experiencing improvement (>4 on previous scale) were asked to judge the likelihood the improvement would have occurred on a 5-point scale where 1=not at all likely and 5=very likely.

Source: Employer post-training survey.

Factors contributing to DES training outcomes: subgroup differences

Past research has shown how workplace training outcomes can be affected by characteristics of the workers, their organization and the context and process by which training is implemented. However, as noted, the number of observations for this dataset is quite small, which has two implications for the analysis. First, it will be difficult to observe statistically significant differences in any outcomes for most subgroups of participants. Second, given the small sample size, it was also impossible to conduct multivariate analysis (regression) contrary to what was planned at the beginning of this project (when it was expected there would be approximately 100 participants in training). **Nevertheless, there are limited number of indicators for which sufficient sample size does exist to allow for bivariate analysis and statistical testing. We focus on the core outcome variables in the study, namely, digital skills gains and a number of the attitudinal and psychosocial composite variables that were presented above.**

We cross-tabulated these outcomes with selected pre-training contextual variables on worker demographics (gender, age, education, language), sector and occupation, and baseline levels of other key variables including literacy and ICT skills, attitudes (towards education and work), future orientation, social networks, and workplace engagement. In addition to these characteristics, we were able to look for differences in outcomes across key implementation factors (e.g., reasons for taking the training, motivations and employer support, and degree of satisfaction with the early

implementation). This enabled us to identify a small number of important differences in outcomes where training was more (or less) effective than for others.

Worker demographics – gender, age, language

Gender

Few gender differences were observed in most participant outcomes. One exception was a slightly larger average gain in digital skills among women in the second workshop. As the second panel of Table 28 illustrates, women gained an average of 39.6 percentage points compared to 27.6 for men. This 12 percentage point difference was statistically significant.

Table 28 Differences in digital skills gains, by gender: mean change in pre/post-training scores by workshop/digital skill

Workshop	Mean skills gain (percentage points)				Number taking test
	Men (1)	Women (2)	Difference (1 – 2)	Significance	
Workshop 1: Communicating electronically with co-workers, suppliers and clients					
Mean gain for those taking all steps and tests	35.0	34.9	0.1	No	M: 27 F: 21
Workshop 2: Consulting/reading and using digital documents by accessing the Internet and databases					
Mean gain for those taking all steps and tests	**27.6**	**39.6**	**-12.0**	**Yes * (P=0.0973)**	**M: 15 F: 17**
Workshop 3: Completing digital forms and commercial transactions on the Internet					
Mean gain for those taking all steps and test*	34.5	38.4	3.9	No	M: 5 F: 8

Notes: *Results should be treated with some caution given the small number of participants in this workshop.

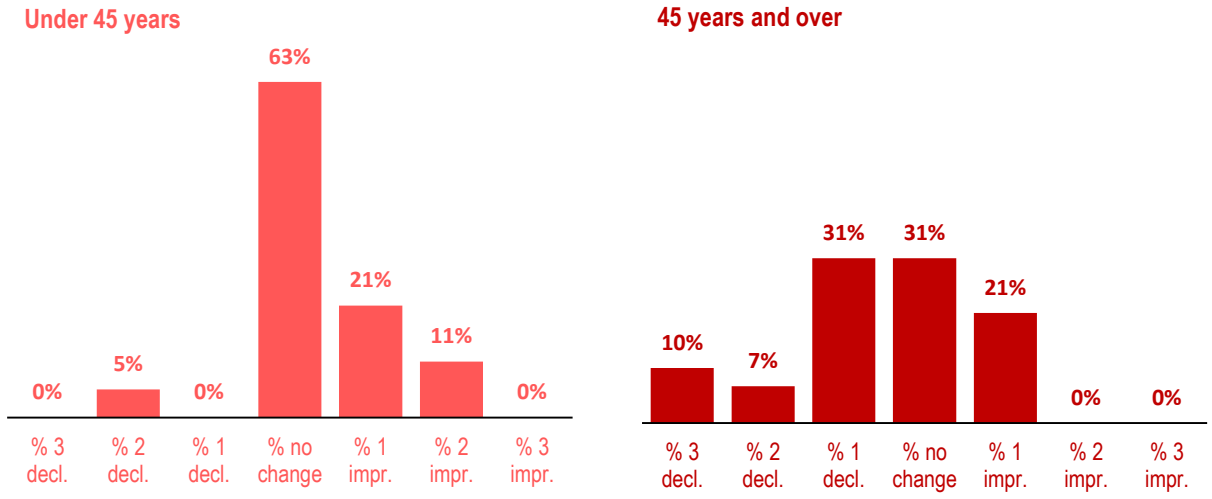
M=Male, F=Female.

Source: Platform pre- and post-training assessment tests and platform administrative data.

Age

One notable difference was observed in participant outcomes between older (45+ year) and younger workers (under 45). Changes in attitudes towards education and training were quite different between older and younger workers. As shown in Figure 25, older workers were more likely to experience a deterioration in their attitudes towards education with over a quarter of them (27.6 percentage points) experiencing more declining indicators than increasing indicators. The exact opposite pattern is observed among younger workers, where 26.3 percentage points more experience improving versus declining indicators.

Figure 25 Changes in attitudes towards education and training, by age



Source: Employee pre- and post-training surveys.

Language

There were differences in at least two key outcomes based on the language of participants. With respect to digital skills gains, French-speaking participants experienced slightly larger gains than English speakers. As shown in Table 22, French speakers experienced an average gain of 46 percentage points in workshop one compared to 22 percentage points for English speakers. At the same time, French speakers also experienced slight improvements in work attitudes, while English participants experienced declining attitudes. Figure 26 illustrates that English speakers were much more likely to have experienced declining indicators of perceived control over their work and job (31.6 percentage points) compared to French speakers who were slightly more likely to have improving indicators (7.7 percentage points).

Table 29 Differences in digital skills gains, by language: mean change pre/post-training scores, by baseline workshop/digital skill

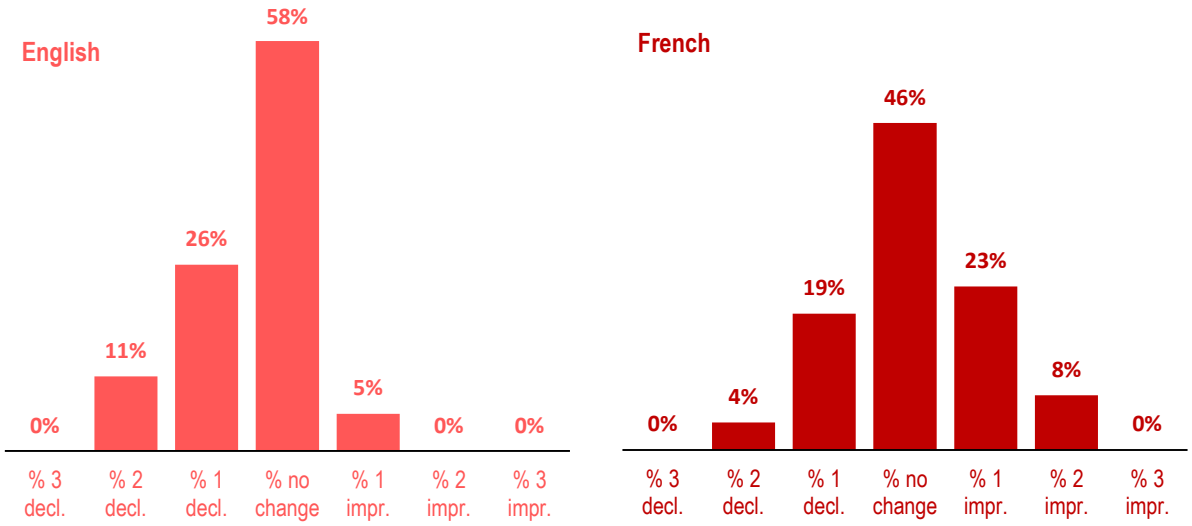
Workshop	Mean skills gain (percentage points)				Number taking test
	English (1)	French (2)	Difference (1 – 2)	Significance	
Workshop 1: Communicating electronically with co-workers, suppliers and clients					
Mean gain for those taking all steps and tests	**22.0**	**46.0**	**-24.0**	**Yes *** (P=0.0004)**	**E: 18 F: 23**
Workshop 2: Consulting/reading and using digital documents by accessing the Internet and databases					
Mean gain for those taking all steps and tests	33.1	35.5	-2.4	No	E: 11 F: 17
Workshop 3: Completing digital forms and commercial transactions on the Internet					
Mean gain for those taking all steps and test*	33.7	36.0	-2.3	No	E: 5 F: 6

Notes: *Results should be treated given the small number of participants in this workshop.

E=English-speaking, F=French=speaking.

Source: Platform pre- and post-training assessment tests.

Figure 26 Changes in work attitudes: satisfaction with work, by language



Source: Employee pre- and post-training surveys.

Sector and occupation

Given that the training content of this model is contextualized to the manufacturing sector but that it was the intention for the product to be widely available, an important consideration in this project is the models' transferability of the training model to the wider economy. Thus, we created sector as well as occupational subgroups in order to observe any differences in outcomes between them. For sector there were two groups: one for those in manufacturing and the other for those in service and other settings. Similarly, for occupation, participants were divided into and production/trades and administrative/service groups. The results of the analysis for these subgroups revealed no differences of note. While noting the small sample sizes of these groups, the finding of no differences in outcomes between the manufacturing and other sectors suggests that **this training program may be applicable beyond the manufacturing sector, as was the intention**.

Human capital – education, literacy and digital skill level

Education level – no PSE vs. some PSE

As most of the sample had at least a high school diploma, a meaningful divide (providing a sufficient sample size in two groups) could be created among only those with some post-secondary educational (PSE) credential and those without one. Few differences were observed across these groups. However, one important exception was in the digital skills gains experienced by participants. Table 23 illustrates that those without any post-secondary education credential achieved somewhat higher average gains in Workshop 1 at 38.8 percentage points, compared to

those with some PSE at 28 percentage points. While this is a small difference, **it does confirm that the training is indeed helping those with lower education levels, which can be equated with lower literacy levels**, with higher average skill gains than those with higher credentials. The next section will consider a related subgroup based on pre-training literacy and ICT levels, to confirm whether the project helped those at the lower ends of the literacy distribution, as planned.

Table 30 Differences in digital skills gains, by education level: mean change pre/post-training scores, by workshop/digital skill

Workshop	Mean skills gain (percentage points)				Number taking test
	No PSE (1)	Some PSE (2)	Difference (1 – 2)	Significance	
Workshop 1: Communicating electronically with co-workers, suppliers and clients					
Mean gain for those taking all steps and tests	**38.8**	**28.0**	**10.8**	**Yes ** (P=0.0811)**	**L: 31 H: 17**
Workshop 2: Consulting/reading and using digital documents by accessing the Internet and databases					
Mean gain for those taking all steps and tests	35.0	32.3	2.8	No	L: 20 H: 12
Workshop 3: Completing digital forms and commercial transactions on the Internet					
Mean gain for those taking all steps and test*	35.1	40.9	-5.8	No	L: 9 H: 4

Notes: *Results should be treated given the small number of participants in this workshop.

L=low-education (no PSE certificate); H=high-education (PSE certificate of some kind).

Source: Platform pre- and post-training assessment tests and platform administrative data.

Baseline literacy and ICT skills

Participant subgroups were defined based on the baseline level of literacy and ICT skills. First with respect to literacy, a lower baseline subgroup was defined as those with low level 2 (2-) or less before training. In contrast, a higher baseline literacy group was defined as those with upper level 2 (2+) or higher. Table 24 shows that, indeed, **the project was successful in enhancing digital skills of those at the lower end of the literacy distribution, as intended**. Average skills gains in workshop one were 47.2 percentage points among those in the lower literacy group compared to

32.5 percentage points among those in the higher literacy group, a statistically significant difference.

Table 31 Differences in digital skills gains, by baseline literacy level: mean change pre/post-training scores, by workshop/digital skill

Workshop	Mean skills gain (percentage points)				Number taking test
	Lower baseline literacy (1)	Higher baseline literacy (2)	Difference (1 – 2)	Significance	
Workshop 1: Communicating electronically with co-workers, suppliers and clients					
Mean gain for those taking all steps and tests	**47.3**	**32.5**	**14.7**	**Yes ** (P=0.0348)**	**L: 16 H: 20**
Workshop 2: Consulting/reading and using digital documents by accessing the Internet and databases					
Mean gain for those taking all steps and tests	38.7	32.9	5.9	No	L: 10 H: 15
Workshop 3: Completing digital forms and commercial transactions on the Internet					
Mean gain for those taking all steps and test*	42.3	35.9	6.4	No	L: 4 H: 6

Notes: L= Lower Baseline Literacy group defined as those with low level 2 or less (2 or 2-); H=Higher Baseline Literacy group defined as those with upper level 2 or higher (2+)

*Results should be treated given the small number of participants in this workshop.

Source: Platform pre- and post-training assessment tests and CAAT.

To consider differences among those with varying ICT skills, a lower baseline ICT group was constructed as those with less than the mean on the ICT scale score (mean of 3.25). In contrast, a higher baseline ICT group was defined as those equal to or above the mean. Once again, results illustrate that **the project was effective in enhancing digital skills among those in the lower ends of the distribution**. The first panel of Table 25 shows that participants in the lower ICT group experienced average gains of 46.4 percentage points compared to 27.8 percentage points among those with higher starting ICT levels, also a statistically significant difference.

Table 32 Differences in digital skills gains, by baseline ICT level: mean change pre/post-training scores, by workshop/digital skill

Workshop	Mean skills gain (percentage points)				Number taking test
	Lower baseline ICT (1)	Higher baseline ICT (2)	Difference (1 – 2)	Significance	
Workshop 1: Communicating electronically with co-workers, suppliers and clients					
Mean gain for those taking all steps and tests	**46.4**	**27.8**	**18.6**	**Yes *** (P=0.0054)**	**L: 18 H: 24**
Workshop 2: Consulting/reading and using digital documents by accessing the Internet and databases					
Mean gain for those taking all steps and tests	38.0	29.9	8.0	No	L: 12 H: 16
Workshop 3: Completing digital forms and commercial transactions on the Internet					
Mean gain for those taking all steps and test*	27.2	34.7	-7.5	No	L: 2 H: 9

Note: L = Lower Baseline ICT group defined as those with less than the mean on the ICT scale score (3.25); H = Higher Baseline Literacy group defined as those equal to or above the mean.

*Results should be treated given the small number of participants in this workshop.

Source: Platform pre- and post-training assessment tests and pre- and post-training employee surveys.

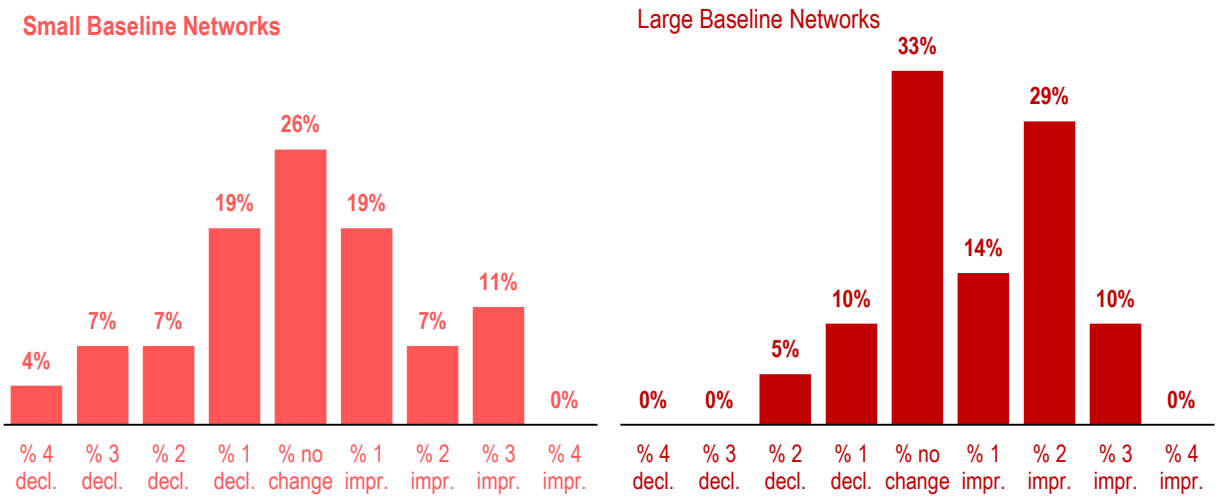
Social networks and work-related social engagement

Subgroups were also defined on basis of participants' pre-training social networks and social engagement within the workplace. First, participants were placed into a small network group when they had fewer than 10 contacts at baseline and a large-sized group when they had 10 or more contacts bat baseline. For work-related social engagement, participants were grouped according to their responses (yes vs. no) to the question at baseline whether they participated in workplace committees or other groups. The results suggest that both social networks and social engagement are relevant to a small number of key outcomes. Figure 27 illustrates **that the positive impacts on future orientation (the degree to which individuals plan for the future rather than focusing solely on the present) was entirely experienced by those with larger social networks at baseline.** Those with small networks were equally likely to experience increasing or decreasing

indicators. In contrast, those with larger networks were 38.1 percentage points more likely to experience indicators of improving future orientation than declining. **This is important as future orientation is a key factor in influencing individuals' future training plans and career paths.**

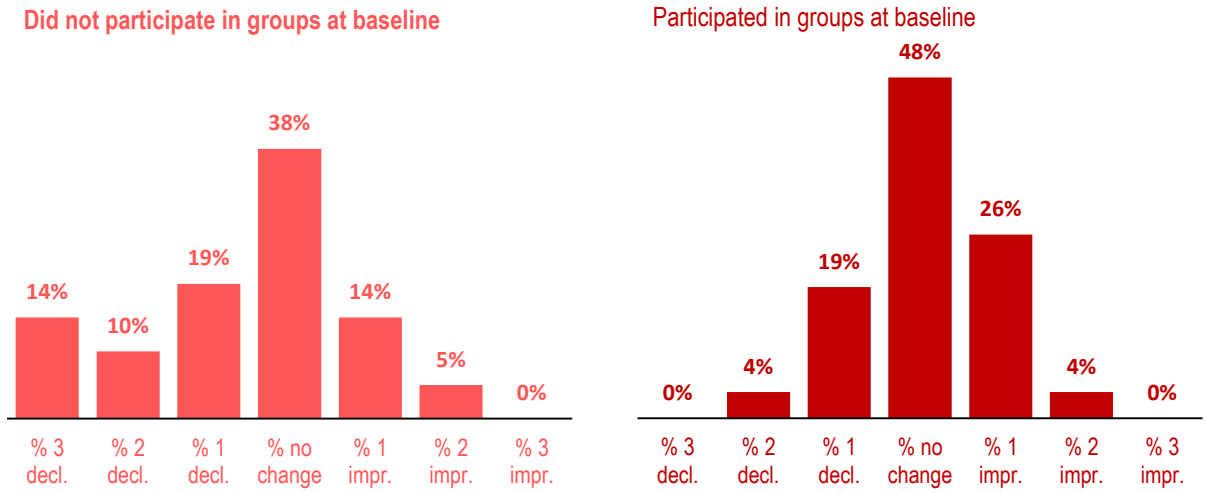
Further evidence of this effect is observed in differences in outcomes among those with varying degrees social engagement before training. Results suggest that those with higher levels of social engagement at work have small improvements in work attitudes towards training and education, whereas those with low levels of engagement experience declining attitudes. Figure 28 illustrates those who did not engage in work-related groups or committees before training were over 31 percentage points more likely to experience declining attitudes towards education and training compared to those who did participate in groups before training. These results may suggest that **additional efforts should be made to engage workers who have smaller networks and are less engaged with their coworkers before training begins**.

Figure 27 Changes in future orientation, by size of baseline networks at baseline



Source: Employee pre- and post-training surveys.

Figure 28 Changes in work attitudes, by social engagement at baseline



Source: Employee pre- and post-training surveys.

Motivations, employer support, satisfaction with early implementation

Given the small sample size, few differences in outcomes have been observed across groups based on implementation factors including the reasons for training, understanding the goals of training, the mandatory vs. voluntary nature of enrolment, perceived employer support for training and participant motivations. However, key differences in outcomes were observed among groups defined on a composite measure of participant motivation and perceived employer support (less than the mean scale score vs. above the mean scale score). Table 26 illustrates that mean gains in digital skills in workshop one were larger for participants who had higher pre-training motivation and perceptions of support from their employer. Those in the higher motivation and employer-support group experienced average gains of 41.9 percentage points compared to those in the lower motivation and support group of 29.1 percentage points, a statistically significant difference. **This underlines the importance of ensuring employees and employers are solidly engaged in the process in its early going.**

Table 33 Differences in digital skills gains, by pre-training motivation and employer support: mean change pre/post-training scores, by workshop/digital skill

Workshop	Mean skills gain (percentage points)				Number taking test
	Lower baseline motivation (1)	Higher baseline motivation (2)	Difference (1 – 2)	Significance	
Workshop 1: Communicating electronically with co-workers, suppliers and clients					
Mean gain for those taking all steps and tests	**29.1**	**41.9**	**-12.8**	**Yes ** (P=0.0590)**	**L: 22 H: 27**
Workshop 2: Consulting/reading and using digital documents by accessing the Internet and databases					
Mean gain for those taking all steps and tests	37.1	33.2	3.9	No	L: 15 H: 20
Workshop 3: Completing digital forms and commercial transactions on the Internet					
Mean gain for those taking all steps and test*	51.3	34.7	16.5	No	L: 6 H: 9

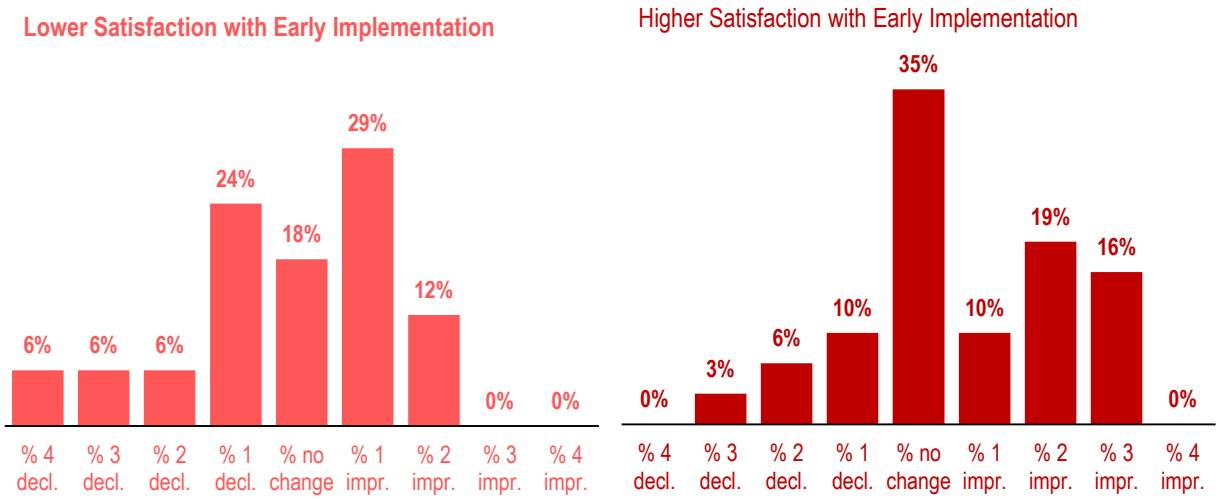
Note: L = Lower Baseline Motivation group defined as those with less than or equal to the mean on a 20-point scale of motivation and employer support (mean = 16). H = Higher Baseline Literacy group defined as those with higher than the mean.

*Results should be treated given the small number of participants in this workshop.

Source: Platform pre- and post-training assessment tests and employee pre- training survey.

Similarly, participants' degree of satisfaction with the early phase of the implementation (i.e., the amount of information provided, the clarity of the information, the recruitment process, the support of the instructor, the support of the guide) appears to influence some outcomes of training. Participants were placed into low and high satisfaction groups based on being less than the mean on the five item satisfaction scale score vs. at or above the mean). Figure 29 shows that participants with a high degree of satisfaction experienced significant improvement in their future orientation after training compared to those in the lower satisfaction group. Those with high satisfaction were 25.8 percentage points more likely to experience improving indicators of future orientation than declining indicators. In contrast, those in the lower satisfaction group were equally likely to experience improvements as declines.

Figure 29 Changes in future orientation, by level of satisfaction



Source: Employee pre- and post-training surveys.

Chapter 6: Concluding summary

Digital Essential Skills in Rural Small Businesses is a national pilot project that was implemented by Restigouche Canada Business Development Corporation (CBDC) from January 2012 to March 2016. The aim of this project is develop a flexible training platform that increases access to basic workplace digital skills training in small rural businesses, specifically, among low literacy workers, who often lack both digital skills and suitable access to digital skills training. In response to this gap, Restigouche CBDC, in concert with a private learning software developer, created an online digital skills training platform. The design and implementation of this training model was assessed in this pilot project with a view to supporting the wider distribution of the platform in the future.

Participants, organizations, and the training delivery process

Platform and research survey data were used to profile participants, organizations and the training itself, with a view also to identifying characteristics by which differences in outcomes could be observed and to address broad evaluation issues.

Profile of participants

Literacy and ICT skills

- **As intended, the program attracted participants with low levels of literacy and digital skills, though not exclusively so.** Just over half (52%) of participants had low literacy, defined as having literacy at level 2 or less according to the CAAT literacy test administered prior to training. Results from the pre-training research survey of employees also reveals that just two in five participants (39%) felt that they had the digital skills to do their job well, which at baseline suggests there was much room for improvement from the training. Similarly, when asked to judge their level of proficiency in the five digital skills results indicate that large proportions (36-49%) self-reported low levels of ability.
- **This perception of low digital-skill proficiency among employees was shared by their employers who responded to the pre-training employer survey.** A majority of organizations (between 75 and 88 per cent) reported at baseline that their staff were not proficient in performing each digital essential skill, thus indicating need for the DES training as well much room for improvement by means of it.
- **Participants' comfort and use of ICTs were also fairly low among this group of employees, consistent with the intended target.** Only two in five participants (39%) reported that ICTs were a big part of their job and under half (48%) felt they were good with computers. Employer responses were consistent with this finding.

Demographics: gender, age, marital status, education

- **About 40 per cent of participants were female, suggesting that men were somewhat over-represented in the sample compared to Canadian adults with lower literacy.** Latest results

(2012) from the Programme for the International Assessment of Adult Competencies (PIAAC) show that men and women have similar distributions of proficiency in literacy and program-solving in a technology-rich environments.

- **Participants represented a fairly mature workforce, about two-thirds were married or in common-law relationships, and there was an even split between English and French as the language spoken in the workplace.** Just over 18% of participants are under 35 years of age while almost two-thirds (65%) are 45 years or older. About a third of participants speak primarily French at home and about a quarter speak English. As for language used primarily at work, participants are evenly split between French and English.
- **The majority of participants had a fairly low educational attainment, consistent with the intended target.** Educational attainment was more of an administrative criterion, a proxy indicator of low literacy, as it was not possible to measure literacy levels prior to recruitment. The aim was to recruit participants with a high-school diploma (one that was obtained some time ago) or less. Results reveal that, indeed, two thirds of the sample (66%) have a high school diploma (38%) or less (28%).

Psychosocial outcomes pre-training: self-efficacy, social engagement, stress, locus of control

- **Most participants were happy in their jobs, though large minorities reported experiencing stress and low levels of control over their work.** Most participants worked in workplaces that were family-friendly (83%) and where they were satisfied with the overall quality of their workplace (87%). However, a sizeable proportion of participants reported having anxiety in their jobs (35%) and/or little say in their work (30%).
- **Participants reported high levels of confidence, self-efficacy, and persistence in their work, but with somewhat low levels of social engagement in the workplace and lacking an orientation towards the future.** Eight in ten participants reported having high self-esteem and almost all participants felt they did a good job and were persistent in their work (97%). However, a sizable proportion of participants had limited engagement in the workplace, with less than half (43%) taking part in workplace groups or events and a sizable minority lacking a focus on the future, important for training, skills development, and career advancement.

Employment: sector, occupation, benefits and other support

- **Participants were recruited from a number of occupations in both manufacturing and service sectors.** The majority, seven in ten participants (69%), worked in manufacturing, production, and in trades, transportation, and machinery occupations. The remainder were in administrative or service occupations such as business and administration, management and health services.
- **A majority of participants were in full-time, year-round jobs, consistent with the intended target, as intended.** Only 29% of participants were under short-term contract and/or regularly worked on a part-time basis. The purpose of this criterion was to increase chances of participants' having sufficient time to complete the training.

- **Access to and take-up of employer benefits and supports for learning and training were moderate to high.** Almost all participants (92%) reported having paid vacation leave while about 63% said they had paid sick leave and/or employer-paid medical, drug and/or dental insurance. As for learning supports, about four in five (82%) reported participating in training generally on company time. However, less than half (47%) reported that they have had their external education/training costs paid for by their employer. Almost four in five participants (78%) agreed somewhat or strongly that they were happy with the training they received from their employer.

Profile of organizations

- **Nearly all participating organizations were small and medium-sized, which were the target of this intervention.** All organizations but one had less than 100 employees and therefore, by Statistics Canada and Industry Canada standards, represent small- or medium-sized organizations.
- **Organizations were recruited from five provinces**: Alberta (36%), Manitoba (6%), New Brunswick (28%), Québec (25%), and Nova Scotia (4%). They represented an equal mix of those whose primary working language was French and English in their workforce.
- **There was a fairly strong training culture in participating organizations, but not with regard to digital skills training.** Managers/owners of six out of the eight participating organizations strongly agreed with the statement that training is important to the profitability of the organization. This was reflected in the strong employer supports that participants reported. However, that culture does not extend to digital skills training, as only one employer spent any money on this kind of training.

Profile of DES training and intentionality

- **Platform data indicate that a large majority of participants accessed each learning step a small number of times and that proportion grew with each learning step.** Generally the percentage of participants who accessed a given step two or more times fell as the training progressed. This suggests that participants could go through the steps more easily as they became more familiar with the platform.
    - There was a decline in the number of participants with each workshop, but this can be attributed to time constraints. The number of participants starting step 1 of Workshop 1 was 63, but only 17 reached step 3 of Workshop 3. The reason is that participants did not have the time to complete further training before end of the pilot.
- **While participants understood the objective of the training (to increase DES) and took the training for their own benefit, a sizeable minority felt obliged to take it.** Seven in ten reported they took the training to improve their digital skills. However, about 30% of participants said they were required to take the digital skills training by their manager/supervisor, while about 50% said they were encouraged to take it ("it would be a good idea").

- **Employees' pre-training motivation and expectations for the training were high, suggesting a high degree of engagement in it, but concerns were expressed by employees about being able to do the training on their own.** Four in five participants (80%) agreed somewhat or strongly that they were looking forward to the training and 73% were motivated to do their best in it. However, about two-thirds of participants (68%) were concerned about having to do the training on their own.
- **Employers were supportive of the training, engaged in the process, and confident in its effectiveness.** An overwhelming majority of participants (95%) reported that their employer supported them in the training. Despite reporting low levels of digital skills and ICT proficiency among their employees, most employers were confident that the DES training would increase ICT markers relating to employee acceptance, comfort, proficiency, the amount of time to do tasks, and overall use.

Addressing overall evaluation issues: rationale, targeting, fidelity

The evidence from the profiling exercise enabled the researchers to address a number of traditional evaluation issues:

- **Rationale: The rationale for a DES training program was demonstrated.** In developing the DES training platform and implementing this pilot to evaluate it, CBDC Restigouche held that small and medium-size organizations in rural settings have workforces that lack digital skills, which prevents the organizations and workers from fully taking advantage of digital technologies. The evidence gathered in this evaluation indicated that both participating employees and the small and medium-sized organizations that employ them were experiencing digital skills gaps before the training. A majority participating organizations reported that their employees were not proficient in digital tasks and information and communications technologies and that, moreover, they spent very little on digital skills training over the previous year. Similarly, large proportions of participating employers reported that their employees were not proficient in digital tasks. This would suggest that there was and is in fact a need for a program aimed at enhancing digital skills and that DES program fulfills this need.
- **Targeting/recruitment/selection: There is evidence that program administrators did reach, to a large extent, their intended targets.** As intended, the sample was formed with a majority of employees (52%) having low literacy levels (Level 2 and less than level 2). The fact that a large proportion (48%) had higher literacy level (more than level 2) enabled the researchers to compare the performance of low literacy employees with those with a higher literacy level and judge for what level of literacy the Workplace Digital Skills was most suitable. While large proportions of participating employees indeed reported DES and ICT gaps, there was a sizeable number as well who self-reported fairly high levels of DES/ICT proficiency, enabling the researchers to observe differences in outcomes by DES/ICT level. Furthermore, a large proportion of participants were in year-round, full-time jobs, thus ensuring those who were registered for the training would be available for training and testing during the pilot.
- **Fidelity: Program fidelity was demonstrated in this evaluation.** Most participating employees reported that they were in the program to enhance their digital skills, indicating

they fully understood the purpose of the training and that those implementing the program adequately explained its purpose during the promotional and recruitment stage. Similarly, employers were supportive and optimistic about the training, indicating that they too were engaged in the process. This high degree of engagement can likely be attributed to how program administrators promoted it to potential participating employers and employees. These are good results in light of the fact that the piloting of the online training program was done in two time frames (winter 2013 and fall 2015) and with a 16-month separation between the two phases.

Meeting implementation objectives

Platform assessment data and research survey data were analysed to measure the extent to which the main implementation objectives of the training were met, in terms of flexibility and usability for lower-literacy workers. Also considered is the degree to which participants were satisfied with other implementation aspects of the training platform, in regard to its design and delivery.

Flexibility: Did the model provide sufficient flexibility in terms of options for access and customization?

- **Accessibility: Participants valued the flexibility in access to the platform at both different times and in different locations.** When asked at the end of respective workshops what they liked about the training, over a third (35%) of participants in Workshop 2 – and all participants (100%) in Workshop 3 – said they liked the ability to take the training *when they wanted*. Furthermore, 39% of those in Workshop 2 and 80% in Workshop 3 said they liked *flexibility in location*.
- **A sizable proportion of participants took advantage of the accessibility features: an impressive proportion of participants, far in excess of traditional workplace LES training models, made use of the training platform outside work.** About a quarter of participants (23%) said that they used the platform outside their normal work location and time – which is more than double the rate expected (10%) from traditional workplace LES training models (Gyarmati et al., 2014).
- **Customizability: A sizable majority of participants valued being able to customize parts of their training experience, such as the ability to retake parts of a workshop.** 89% of respondents in workshop two and 75% in Workshop 3 said that they liked — either somewhat or a lot — the ability retake part of a workshop. The responses were similar for retaking a test: 89% and 88% of Workshops 2 and 3, respectively, said they liked this feature.

Suitability: Was the model suitable for low-literacy workers in a diverse range of occupations in rural organizations, in terms of its usability, content-accessibility, and autonomy?

- **Usability: Participants reported the platform as highly usable in terms of its navigability and the level of comfort they experienced – thus meeting a major objective of the**

program. Four in five participants said that it was easy to navigate the platform while a similar proportion said that they felt comfortable during the training.

- **Content-accessibility: In addition to the platform itself, most participants found the training content to be accessible.** After each workshop, participants were asked to rate the clarity and ease of understanding of the instructions and language used. At least 85% of participants in each workshop said that they found the language used on the platform easy to understand. Similarly, when asked in the follow-up survey, after all workshops were complete, 71% of participants felt they understood the content of the training well.
- **Furthermore, the subgroup analysis revealed that there were no significant differences in understanding between low and high literacy participants, thus underlining the accessibility of the training for low-literacy workers.** However, participants who volunteered for the training reported a 1.5 higher mean level of understanding (on the 10-point scale) than those who were required or instructed to take the training (8.4 vs. 6.9). This points to the value, in information sessions, of making employers and employees aware of the value of voluntary participation in the program.
- **However, the content of the tests and surveys administered before and after the training may have been problematic for participants.** Assistance from Instructors was considerably more frequently sought in regard to the content of tests and surveys than the training itself. This may be addressed in the full production version of the training model as an instruction model will be provided with it.
- **Autonomy: Independence of learning did not appear to be a strong priority for most participants.** Rather, interaction with the Instructor and their colleagues was a critical aspect of the training for most participants. Only a very small minority (15%) took the training on their own most of the time. The rest were evenly split between never and not often taking the training on their own. Given there are no well-established benchmarks for appropriate levels of autonomy for online learning, participants' preferences in this regard provide a reasonable guide – and suggest that while flexibility in access is certainly important, independence of learning may be less so.[12]
- **Employees whose participation was mandatory or strongly encouraged accessed the training outside of regular hours at very low rates (14%) compared to those who voluntarily took part (67%).** Also of note in this regard was, as noted above, the fact that two-thirds of participants went into the training not looking forward to its self-directed nature. This suggests the need, at the recruitment stage, for making prospective participating employees and employers aware of the value of voluntary engagement in the process.

[12] The fact that participants were involved in a pilot project may have led to higher levels of interaction with Guides and Instructors than would otherwise be the case in a wider non-pilot implementation of the platform. Participants often played an informal role in the platform development, where they were asked to report bugs or other areas for improvement, which would have encouraged further interaction rather than autonomous use.

Other indicators of implementation success: What other indicators or aspects of delivery are indicative of successful implementation?

- **A large proportion of participants reported being happy with all aspects of the training, particularly, with the assistance provided by the Guide and the Instructor.** When asked about their satisfaction following the completion of training, over 8 in 10 participants were somewhat or very happy with the help provided by the Instructor and the Guide (87% and 81%, respectively). Similarly large proportions expressed satisfaction with the computer hardware (the tablet) they took the training on (82%).
- **There was some indication that the speed of the platform was a concern for some participants.** A bare majority (52%) of participants reported being happy with the speed of the software, suggesting a possible area for improvement. It is unclear, however, whether this issue relates to constraints with the software itself or with the bandwidth available to the participant accessing it. In support of the latter possibility, there was also some concern expressed with the Internet connection. This would suggest that ensuring participants have access to high-quality hardware in order to provide sufficient processing speed as well as bandwidth is an important consideration for future implementations.
- **Satisfaction among employers with key components of the training platform was fairly high.** These elements included managing the organization's training program, assigning workshops to employees based on need, and monitoring employee progress. Employers were also generally supportive of other aspects of the training including the support of the Instructor and Guide and the response of their own staff to the training. However, four or more of the organizations recommended for improvement technical support and navigation instructions, which could be addressed with a manager instruction manual.

Overall implementation findings

Meeting main implementation objectives

- **The main implementation objectives of the DES training model relating to flexibility and usability have been met.** Regarding flexibility, sizeable proportions valued its accessibility as to time and location and took advantage of the accessibility features, far in excess of traditional workplace LES training models. A large majority also valued being able to customize parts of their training experience. Employers, too, were happy with the customizability aspect of the model. Similarly for usability, most participants found the platform navigable and the content accessible for low-literacy workers. **However, participants registered some concerns with navigating the log-in section and with the content of the platform tests and surveys**. These are problems that could likely be addressed with the introduction of a learner instruction manual or video in the full-production version of this product.
- **There is evidence that the third usability objective – autonomy – may have been more challenging to meet, or at very least, was not a significant priority of most participants.** Sizable proportions of participants never took the training on their own and/or required

assistance from their Instructor or Guide. Also, a large proportion of employees expressed some concern before the training about its self-directed nature. This suggests the need by program administrators to better prepare prospective employees for this aspect of the model, such as by providing a learners instruction manual and/or a presentation video.

- **The subgroup analysis revealed few differences among subgroups, suggesting its wide applicability across the population.** In particular, there were no differences in perceptions of content-accessibility by literacy level, suggesting low-literacy workers can access the training product's content as easily as higher literacy ones.
- **However, there were two interesting differences by groups defined by engagement in the training.** First, participants who volunteered for the training were more likely to understand its content than those who were required or instructed to take the training. This points to the value, in information sessions, of making employers and employees aware of the value of voluntary participation in the program. Second, those who voluntarily participated in the program were more likely to do the training autonomously on their own, further underlining the need to make the value of voluntary participation clear when recruiting participants.

Attaining other implementation outcomes

- **Large proportions of participants reported being happy with all aspects of the training, particularly, with the assistance provided by the Guide and the Instructor.** Large proportions were happy with the help provided by the Instructor and the Guide, the computer hardware, the assessments and survey on the platform, and the training overall.
- **In terms of speed of the platform, conclusions are difficult to make.** Only about half of participants said they were satisfied with the speed of the platform; however, it is unclear whether this relates to constraints with the software itself, or with the available hardware participants were accessing it from, and/or issues with having access to high-speed Internet in the workplaces. One factor that must be recognized is that the platform being used in the piloting was a Beta version, and so the final version would be programmed to ensure maximum performance in terms of speed. Concerns were expressed by participants in regards to Internet connections in some of the testing sites. This would suggest the future need to work with employers and developers to ensure participants have access to high-speed Internet and sufficient hardware.
- **Satisfaction among employers with key components of the training platform was also fairly high, with some provisos.** Most were satisfied with such elements as managing the organization's training program, assigning workshops to employees based on need, and monitoring employee progress. However, more than half the participating organizations recommended improvement in technical support and navigation instructions. Indeed, in the full-production of the training model, a manager instruction manual will be provided, which should address these concerns.

Assessing outcomes linked with training effectiveness

Platform assessment data as well as research survey data were analysed to measure the extent to which the main effectiveness objectives of the training were met, i.e., with respect to digital essential skills and information and communications gains. Also measured were the extent to which other potential outcomes were attained, namely training and education attitudes, psycho-social outcomes, and organizational performance. It was not expected that within the narrow timeframe of this project much progress would be observed in attaining the latter two sets of outcomes which typically take longer to manifest themselves.

Digital essential skills

- **Participants in the training program realized large gains in digital essential skills, as measured by changes in platform assessments.** A comparison of the results of the pre- and post-training assessments revealed average gains of between 34 and 37 points (on the 100-point platform scale) across the three workshops. This strongly suggests that the digital skills training provided by the online training platform met one of its primary objectives – to enhance digital skills.
- **In terms of distributional changes, a substantial proportion of participants experienced gains of over 20 percentage points in each learning step of each workshop (as much as 70 points in one of the learning steps).** Very few participants experienced no or few gains at all (less than 20 points on all learning steps).
- **The project was successful in enhancing the skills of those at the lower end of the literacy distribution, thus meeting an important objective of designing a model addressing the needs of lower-literacy workers.** Average skills gains in Workshop one were 47.2 percentage points among those in the lower literacy group (Level 2 or less) compared to 32.5 percentage points among those in the higher literacy group (Level more than 2), a statistically significant difference. The research also demonstrated that the training helped those with lower educational credentials, with slightly higher average gains than those with higher educational credentials. This confirms the association between lower education and lower literacy levels.
- **The project was also effective in enhancing the skills of those at the lower end of the ICT attitudes/practices distribution as well.** Participants in the lower ICT group experienced average gains of 47.3 percentage points compared to 32.5 percentage points among those with higher starting ICT levels, also a statistically significant result.
- **Self-reported results from the follow-up surveys provide strong support for the skills gains observed in the platform assessment results and the role played by the training in these gains.** Compared to their responses before training, there was a one-third increase in the proportion who agreed with the statement that they had the digital skills to do their job effectively (from 45% to 59%). Furthermore, sizeable proportions (39%-50%) reported that it was unlikely that changes in the levels of each digital skill they experienced would have occurred without the digital skills training, i.e., it was likely that the training did play a role in the skills gains. Finally, evidence from the post-workshop surveys indicates that three in

four participants felt they have, indeed, acquired new skills from the workshops and that the knowledge acquired in the training would be useful in the labour market.

- The subgroup analysis added other important findings. First, **skills gains were similar for those in manufacturing and those in "other" sectors, which may suggest that the training, which was contextualized to the manufacturing sector, is applicable more broadly, as intended**. Second, **skills gains tended to be greater for those who were motivated and whose employer supported them, thus underlining the importance of ensuring employees and employers are solidly engaged in the process in its early going**.

Attitudes and practices in Information and Communications Technology (ICTs)

- **There were positive ICT outcomes for a significant percentage of training participants, thus fulfilling another major objective of the program.** The proportion of participants who agreed that they were good with ICTs increased a great deal from 48% before the training to 67% after it, nearly a 20 percentage-point gain.
- **ICTs appeared to be a large part of more participants' jobs.** When asked whether ICTs were a large part of their work, the proportion of participants who agreed rose from 39% at baseline to 50% at follow-up.
- **Employers corroborated the employees' views, as a majority of them observed improvement in their employees' ICT proficiency since the training began.** Moreover, most of them (4-5 of the 5-6 who saw improvement) attributed this to the DES training rather than other factors or activities within the organization.
- **Even at home, ICT confidence grew.** The proportion of participants agreeing with statements on the use of ICTs in searching for information at home and in helping with their children's homework rose greatly from baseline (62% and 20%, respectively) to after the training (76% and 33%, respectively).

Attitudes towards education and training

- **Attitudes towards education and training were very high before and after the training.** A large proportion of participants demonstrated positive attitudes to education before the training began. For the most part, these were maintained at high levels after the training, often in excess of 90% of participants exhibiting positive attitudes.
- **However, there is some indication of a decline in the relative perceived value of training compared to the effort involved.** A large but decreasing majority of participants disagreed that getting an education or training certificates takes too much effort (falling from 70% at baseline to 64% after training). Similarly, after the training, a large majority of participants agreed that one is more likely to get a better job by learning (83%) a proportion that was somewhat lower than it was before the training (96%). This may be an indication that, while participants felt more confident in their digital skills after the training, they did not fully understand the skills' relevance to their job, or to the business in which they worked, and, as a result, to their own career path.

- **A majority of employers felt that the digital skills training positively affected the level of interest and engagement in work-related training in general and digital skills training in particular, both for themselves and among their employees.** Owners/managers were asked to judge the effect of the DES training on their employees' and own attitude toward training. The results indicate that four of the seven participating organizations felt that the program had a positive effect on their own attitudes toward digital and general training, as well their employees' interest participation in general and digital skills training.

Quality of working-life and psychosocial outcomes

- **Few changes were observed in participants' satisfaction with qualitative aspects of work, though there a few modest declines.** Similarly large proportions of participants before and after the training agreed that their workplace was family-friendly ("lets them fit work around family life") (77% at baseline vs. 74% at follow-up) and that they were happy with the training provided at work (79% at baseline and follow-up). Similarly, those reporting a high quality of working life declined modestly from 87% at baseline to 76% after training. The longitudinal and composite analysis confirmed the findings of few changes, again with declines outweighing the increases, but that the changes were not significant.
- **There is weak evidence of a decline in participants' views on the degree of control they have over their work.** The percentage of participants reporting positively that they have a "say" in the direction of their work declined from 70% at baseline to 59% at follow-up, while the proportion agreeing that they do not have control over how they do the job fell from 25% to 17%. The longitudinal and composite analysis indicated that the differences did not represent significant changes over the course of the training, but confirmed the small declines in these indicators.
- **In regard to work-related mental health, evidence was found of reduced procrastination after the training but of a modest increase in stress.** After the training, fewer participants agreed with the statement measuring procrastination (78% vs. 85% before the training, a statistically significant difference), which is a positive outcome, though modest. However, a greater proportion agreed with the statement on anxiety (40% vs. 35% before the training), suggesting a modest increase in anxiety. The longitudinal analysis confirmed these results, specifically the fact that the proportion reducing their agreement with the procrastination statement was greater than the proportion increasing it.
- **Though participants continued to exhibit high levels of self-actualization at work after the training, declines were observed in self-improvement tendencies.** Proportions in excess of 90% continued to rate their importance and proficiency at work highly and their desire to improve themselves. There were small negative changes in participants' self-esteem at work (80% vs. 72% after the training). However, the longitudinal analysis indicated that only one difference was noteworthy: the proportion who disagreed with the statement on self-improvement grew over the course of the training to a greater extent than the proportion who agreed with, indicating some decline in this indicator. As well, the composite indicator suggests an overall negative change in this area.

- **There was little change in perceptions that participants had about their self-efficacy and confidence in their skills.** High proportions continued to have confidence in their critical time management and organizational skills and persistence in their jobs (proportions in excess of 90% before and after the training). The longitudinal analysis confirmed the result of little change in self-efficacy and confidence in skills among participants over the course of the training.
- **There is some evidence of a rise in future orientation among participants.** While for four of the five statements on future orientation, there was a statistically significant decrease in agreement with the statement on focusing on the present, from 63% to 59%. The longitudinal analysis confirmed this result, with a significantly greater percentage of participants decreasing their agreement with this statement than increasing it. The composite indictor also suggests a skewing toward improvement in future orientation over the course of the training.
- **The results indicate some diminishment in participants' social networks over the course of the training.** The proportion of participants who were members of groups at work fell somewhat from 40% to 37% over the course of the training. The longitudinal analysis indicated that proportion who knew increasing numbers of their social groups fell to a significantly greater extent than the proportion who reported fewer numbers whom they knew. The composite indicator confirms this result, with a statistically significant skew toward the lower end of the distribution, suggesting a decline.

Organizational change

- **Few employers felt that gains in organizational performance observed since the training began were actually due to the training.** While some employers reported positive improvements in various performance measures particularly in regard to human resource measures such as staff development, capacity for change and employee confidence, very few indicated that this change was attributable to the digital skills training. It has to be noted that the post-training survey was administered to employers immediately after the end of the piloting of the training in the workplace and therefore there would not have been much time for the training to affect these outcomes. Similarly, the piloting took place over a short period of time (two to four months depending of the business) and was of relatively low dosage (up to two hours per participant).

Overall effectiveness findings

Meeting DES and ICT objectives

- **One of the primary overriding objectives of the training program, indeed, was met – to effectively enhance digital skills of participants.** Participants in the training program realized large DES gains, as measured by the platform and as self-reported by participants, who largely attributed their gains to the training. A substantial proportion experienced gains of over 20 percentage points in each learning step of each workshop.

- **Moreover, skills gains were greater for those with at the lower end of the literacy skills spectrum than those at higher levels, thus addressing the expressed intention for the program to meet the needs of lower-literacy workers.** On the one hand, this could be due to the fact that the program was geared to lower-skilled workers. On the other hand, this could be attributed to the fact that lower-skilled individuals had more room for improvement and so would be expected to gain more – both absolutely and relatively – and they, in fact, did.
- **Skills gains were similar between those in manufacturing and those in other sectors, thus suggesting the training program would be applicable broadly beyond the manufacturing sector.** Much of the training content was contextualized to the manufacturing, so it was important to ensure that the training would be effective on other sectors. Indeed, there were no significant differences in skills gains between participants in the manufacturing and other sectors.
- **There were positive ICT outcomes for a significant proportion of training participants, thus fulfilling another major objective of the program.** The proportion of participants who said that they were good with ICTs and that ICTs were a big part of their job grew greatly over the course of the training, from 59% to 70%. Employers corroborate the employees' views in regards to improvements in ICT proficiency since the training began, attributing this to the DES training.

Other measures of effectiveness

- **There were few changes from before the training to after it in more intermediate outcome indicators that research has shown are often the product of training and can lead to even greater outcomes down the road.** To some extent, this may be attributed to the relatively low dosage (up to 18 minutes per workshop/skill, with a maximum of two hours of actual training for a participant) delivered and to the fact that surveys took place too soon after the training to enable detection of outcomes that typically take some time to manifest themselves.
- **Employees' positive attitudes to education and training remained very much the same at high levels over the course of the training.** However, there was a modest decline in the perceived value of education and training relative to effort, which may be attributed to the training itself making individuals more aware of what it takes to increase skills and get ahead. On the other hand, employers believed that the training contributed to improvement in their employees' and their own attitudes to education and training.
- **Participants continued to be quite satisfied with qualitative aspects at work, but there was some evidence of declines in perceptions of job control.** On the other hand, there is evidence that participants were less likely to procrastinate after the training. As for self-actualization outcomes, there is some evidence of declines in this area, epitomized by declining desire for self-improvement. Again, this may be a question of the training opening participants' eyes as to what they do not know and what they need to get ahead. Self-efficacy levels retained their high levels from before the training. On the other hand, there was an increase in the future orientation of participants over the course of the training, suggesting the training increased participants' awareness of the value of looking ahead, which should serve well in the workforce going forward. Finally, there was negative change in participant's social networks over the course of the training.

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Glossary

CBDC Canadian Business Development Corporation that is responsible for economic development mainly in rural and small town communities, a term used mainly in regard to the client CBDC Restigouche; also called Community Futures Organizations

DES Digital essential skills

Ellicom the e-training developer commission to develop and implement the online training platform for this pilot project

ESDC Employment and Social Development Canada, the federal government department as it was originally called that funded the pilot project, now called Employment, Workforce Development and Labour Canada

ICTs Information and Communications Technologies, consisting of computers and other digital equipment such as cell phones used for managing and communicating digital information

OLES Office of the Literacy and Essential Skills, the section of the sponsoring department (ESDC) overseeing the project.

ONA Organizational Needs Assessment, for gauging the skill needs of employers as a first step in the development of training

PLA Prior Learning Assessment, the instrument used to measure the level of proficiency in each of the five digital skills

SRDC Social Research and Demonstration Corporation, the non-profit organization commissioned to conduct the research for the pilot project and the author of this report

Appendix A: DES training program: evaluation framework

Research Questions

		Is the training model flexible and suitable for low-skilled workers who work in a diverse range of occupations?											Was the training effective in enhancing employees' digital skills and reducing organizations' digital skills gaps?					What factors affect the outcomes?					
		Flexibility		Suitability for low-skilled workers					Other implementation factors				Effectiveness outcomes					Contextual factors					
Level	Data source	Flexible access	Customizability	Website usability: navigability	Accessibility of learning content	Self paced learning	Self-directed learning	Autonomous learning	Employee intentionality - motivation, expectation	Employer intionality - expectation, support	Employee satisfaction with aspects of DES training	Employer satisfaction with aspect of the DES training	DES and other skill gains	ICT attitudes and practices	Training and education experience/attitudes	Psycho-social outcomes - job and self	Organizational performance	Aspects of DES training - Intentionality	Initial DES and literacy levels	Demographic characteristics	Extrinsic and intrinsic aspects of job	Psycho-social traits	Aspects of organization
Employee	Administrative data																	X		X			
	Self-evaluation responses												X										
	Scores		X				X						X						X				
	Pre-training research survey				X				X	X	X		X	X	X	X		X	X	X	X	X	
	Post-training survey	X		X	X						X		X	X	X	X							
	End-of-workshop research survey	X	X	X	X	X	X	X			X		X	X									
	Canadian Academic Achievement Test																		X				
Em-ployer	Pre-training research survey									X	X	X	X	X	X		X	X					X
	Post-training research survey	X	X								X	X	X	X	X		X						
	Piloting instructor testing report			X	X			X															

Appendix B: Longitudinal changes in composite variables

Table 34 Changes in attitudes towards education and training before and after DES training (Longitudinal) (n = 48)

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
You are more likely to get a better job if you do some learning				
No Change in attitude	66.7			
% Increasing in agreement	14.6			
% Decreasing in agreement	18.8			
Difference in Percentage with Increase vs. Decrease	-4.17		8.40	No
Average change on 5-point scale		-0.042	0.15	No
Learning new things makes you more confident				
No Change in attitude	75.0			
% Increasing in agreement	10.4			
% Decreasing in agreement	14.6			
Difference in Percentage with Increase vs. Decrease	-4.2		7.27	No
Average change on 5-point scale		-0.042	0.15	No
Getting education/certificates takes too much effort				
No Change in attitude	45.8			
% Increasing in agreement	33.3			
% Decreasing in agreement	20.8			
Difference in Percentage with Increase vs. Decrease	12.5		10.58	No
Average change on 5-point scale		0.250	0.23	No

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
Composite Indicators of Improvement/Decline				
% with net of three declining	6.3			
% with net of two declining	6.3			
% with net of one declining	18.8			
% with net of no change	42.8			
% with net of one improving	20.8			
% with net of two improving	4.2			
% with net of three improving	0.0			
Average Change (15-point scale)		0.167	0.38	No
Average number of indicators Improving/Declining		-0.208	0.17	No

Table 35 Changes in attitudes towards quality of working life and employer support (Longitudinal) (n = 48)

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
My employer lets me fit work around my family life				
No Change in attitude	70.8			
% Increasing in agreement	14.6			
% Decreasing in agreement	14.6			
Difference in Percentage with Increase vs. Decrease	0.0		7.88	No
Average change on 5-point scale		0.042	0.13	No
I am happy with the training I receive in order to do my job				
No Change in attitude	66.7			
% Increasing in agreement	14.6			
% Decreasing in agreement	18.8			
Difference in Percentage with Increase vs. Decrease	-4.2		8.40	No
Average change on 5-point scale		-0.021	0.13	No
I am happy with the overall quality of my working life				
No Change in attitude	70.8			
% Increasing in agreement	8.3			
% Decreasing in agreement	20.8			
Difference in Percentage with Increase vs. Decrease	-12.5		7.66	No
Average change on 5-point scale		-0.167	0.16	No

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
Composite Indicators of Improvement/Decline				
% with net of three declining	0.0			
% with net of two declining	8.3			
% with net of one declining	33.3			
% with net of no change	35.4			
% with net of one improving	16.7			
% with net of two improving	2.1			
% with net of three improving	4.2			
Average Change (15-point scale)		-0.146	0.32	No
Average number of indicators Improving/Declining		-0.167	0.16	No

Table 36 Changes in job attitudes: self-actualization and esteem (Longitudinal) (n = 48)

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
Overall, I feel I do a good job				
No Change in attitude	82.1			
% Increasing in agreement	14.6			
% Decreasing in agreement	18.8			
Difference in Percentage with Increase vs. Decrease	-4.2		8.40	No
Average change on 5-point scale		0.042	0.14	No
In my job, I'm more focused on learning and getting better than on competing and being the best				
No Change in attitude	68.8			
% Increasing in agreement	8.3			
% Decreasing in agreement	22.9			
Difference in Percentage with Increase vs. Decrease	**-14.6**		**7.87**	**Yes * (P=0.0702)**
Average change on 5-point scale		-0.167	0.14	No
I feel that what I do at work is important and useful				
No Change in attitude	79.2			
% Increasing in agreement	10.4			
% Decreasing in agreement	10.4			
Difference in Percentage with Increase vs. Decrease	0.0		6.66	No
Average change on 5-point scale		0.000	0.13	No

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
I see myself at work as someone who has high self-esteem				
No Change in attitude	52.1			
% Increasing in agreement	22.9			
% Decreasing in agreement	25.0			
Difference in Percentage with Increase vs. Decrease	-2.1		10.09	No
Average change on 5-point scale		-0.104	0.14	No
Composite Indicators of Improvement/Decline				
% with net of two declining	14.6			
% with net of one declining	27.1			
% with net of no change	35.4			
% with net of one improving	16.7			
% with net of two improving	2.1			
% with net of three improving	2.1			
% with net of four improving	2.1			
Average Change (20-point scale)		-0.313	0.38	No
Average number of indicators Improving/Declining		-0.167	0.16	No

Table 37 Changes in job attitudes: self-efficacy with skills (Longitudinal) (n = 48)

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
I try to plan out the things I have to do in my job				
No Change in attitude	63.8			
% Increasing in agreement	21.3			
% Decreasing in agreement	14.9			
Difference in Percentage with Increase vs. Decrease	6.4		8.82	No
Average change on 5-point scale		0.128	0.18	No
In my job, I use my time well and organize my work area so that I can work under the best conditions				
No Change in attitude	79.2			
% Increasing in agreement	8.3			
% Decreasing in agreement	12.5			
Difference in Percentage with Increase vs. Decrease	-4.2		6.63	No
Average change on 5-point scale		-0.063	0.14	No
I stick with my job even when it is challenging or difficult				
No Change in attitude	81.3			
% Increasing in agreement	6.3			
% Decreasing in agreement	12.5			
Difference in Percentage with Increase vs. Decrease	-6.3		6.25	No
Average change on 5-point scale		-0.083	0.12	No

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
Composite Indicators of Improvement/Decline				
% with net of three declining	2.1			
% with net of two declining	8.3			
% with net of one declining	14.6			
% with net of no change	54.2			
% with net of one improving	10.4			
% with net of two improving	8.3			
% with net of three improving	2.1			
Average Change (15-point scale)		-0.021	0.36	No
Average number of indicators Improving/Declining		-0.042	0.17	No

Table 38 Changes in feelings of control over one's work and destiny (Longitudinal) (n = 36)

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
I feel I have a say in and can affect my area of work				
No Change in attitude	52.1			
% Increasing in agreement	16.7			
% Decreasing in agreement	31.3			
Difference in Percentage with Increase vs. Decrease	-14.58		9.87	No
Average change on 5-point scale		0.042	0.13	No
I don't think I have much control over how I do my job				
No Change in attitude	52.1			
% Increasing in agreement	25.0			
% Decreasing in agreement	22.9			
Difference in Percentage with Increase vs. Decrease	2.1		10.09	No
Average change on 5-point scale		-0.021	0.13	No
Composite Indicators of Improvement/Decline				
% with net of two declining	6.3			
% with net of one declining	22.8			
% with net of no change	52.1			
% with net of one improving	14.6			
% with net of two improving	4.2			
Average Change (10-point scale)		-0.35	0.37	No
Average number of indicators Improving/Declining		-0.13	0.13	No

Table 39 Changes in work-related stress and procrastination (Longitudinal) (n = 40)

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
Anxiety: I get quite anxious in my job.				
No Change in attitude	41.7			
% Increasing in agreement	27.1			
% Decreasing in agreement	31.3			
Difference in Percentage with Increase vs. Decrease	-4.2		11.12	No
Average change on 5-point scale		-0.063	0.17	No
Procrastination: I find I sometimes do things (e.g., waste time, not try hard, put off things till tomorrow) that may lower my chances of doing well in my job.				
No Change in attitude	50.0			
% Increasing in agreement	16.7			
% Decreasing in agreement	33.3			
Difference in Percentage with Increase vs. Decrease	**-16.70**		**10.00**	**Yes * (P=0.10)**
Average change on 5-point scale		**0.333**	**0.16**	**Yes ** (P=0.0478)**
Composite Indicators of Improvement/Decline				
% with net of two declining	7.0			
% with net of one declining	11.0			
% with net of no change	37.6			
% with net of one improving	18.8			
% with net of two improving	6.3			
Average Change (15-point scale)		0.271	0.26	No
Average number of indicators Improving/Declining		-0.208	0.16	No

Table 40 Changes in attitudes: future orientation (Longitudinal) (n = 48)

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
I make decisions on the spur of the moment (with little thought).				
No Change in attitude	56.3			
% Increasing in agreement	16.7			
% Decreasing in agreement	27.1			
Difference in Percentage with Increase vs. Decrease	-10.4		0.09	No
Average change on 5-point scale		-0.229	0.20	No
Meeting tomorrow's deadlines and doing other necessary work come before tonight's "play" (e.g., before recreation or relaxation).				
No Change in attitude	50.0			
% Increasing in agreement	27.1			
% Decreasing in agreement	22.9			
Difference in Percentage with Increase vs. Decrease	4.2		0.10	No
Average change on 5-point scale		0.125	0.19	No
Generally, I am focused more on what is going on now than on what will happen in the future.				
No Change in attitude	39.6			
% Increasing in agreement	25.0			
% Decreasing in agreement	35.4			
Difference in Percentage with Increase vs. Decrease	-10.4		0.11	No
Average change on 5-point scale		**-0.375**	**0.22**	**Yes * (P=0.0979)**

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
Since "Whatever will be, will be," it doesn't really matter what I do (i.e., I can't affect the future)				
No Change in attitude	37.5			
% Increasing in agreement	22.9			
% Decreasing in agreement	39.6			
Difference in Percentage with Increase vs. Decrease	-16.7		0.11	No
Average change on 5-point scale		-0.292	0.21	No
You can't really plan for the future because things change so much.				
No Change in attitude	41.7			
% Increasing in agreement	33.3			
% Decreasing in agreement	25.0			
Difference in Percentage with Increase vs. Decrease	8.3		0.11	No
Average change on 5-point scale		0.083	0.19	No
Composite Indicators of Improvement/Decline				
% with net of four declining	2.1			
% with net of three declining	4.2			
% with net of two declining	6.3			
% with net of one declining	14.6			
% with net of no change	29.2			
% with net of one improving	16.7			
% with net of two improving	16.7			
% with net of three improving	10.4			
% with net of four improving	0.0			
Average Change (25-point scale)		-0.688	0.46	No
Average number of indicators Improving/Declining		0.333	0.24	No

Table 41 Changes in workplace engagement and social networks (Longitudinal) (n = 40)

Outcome	Percentage of participants	Average change on scale score	Standard error	Significance
I feel I have a say in and can affect my area of work				
No Change in attitude	72.3			
% Increasing in agreement	10.6			
% Decreasing in agreement	17.0			
Difference in Percentage with Increase vs. Decrease	-6.4		0.08	No
I don't think I have much control over how I do my job				
No Change in attitude	46.7			
% Increasing in agreement	15.6			
% Decreasing in agreement	37.8			
Difference in Percentage with Increase vs. Decrease	**-22.2**		**0.10**	**Yes ** (P=0.0398)**
Average change on 5-point scale		**-0.622**	**0.21**	**Yes *** (P=0.0047)**
Composite Indicators of Improvement/Decline				
% with net of two declining	12.5			
% with net of one declining	22.9			
% with net of no change	43.8			
% with net of one improving	20.8			
% with net of two improving	0.0			
Average Change (6-point scale)		**-0.646**	**0.23**	**Yes *** (P=0.0072)**
Average number of indicators Improving/Declining		**-0.271**	**0.14**	**Yes ** (P=0.0516)**

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