Foundations: Implementation and 12-week impacts of a literacy and essential skills intervention for job seekers

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Summary of major findings

The Foundations Workplace Skills Project (FWSP), a three-year initiative led by the Training Group at Douglas College, British Columbia, is the first study to use a randomized control trial design to evaluate the impacts of a Literacy & Essential Skill (LES) based program model targeted specifically to meet the needs of unemployed job seekers.

This first of two reports ***describes the implementation of the FWSP program model across three sites nationally***, and ***summarizes the short-term (12 week) impacts*** of the program on participant career adaptability and Essential Skill gains. A subsequent report[1] describes longer-term (12 month) program impacts on a variety of outcomes, including participation in further training and labour market advancement.

Recruitment and participant characteristics

- The two principle sites for the implementation of the FWSP – Douglas College (British Columbia) and Conestoga College (Ontario) – encountered different recruiting challenges. The challenge at Conestoga around whether EI clients would need to seek approval under section 25 of the EI Act before being referred into the FWSP, was resolved by repositioning the program as an employment assistance rather than training intervention. The challenge at Douglas College was related to the wholesale restructuring of employment service delivery throughout the province, with the result that the college was unable to rely on its usual caseworker referrals and had to rely on a greater extent on making connections with community agencies working outside the employment services delivery framework.
- As a result of these challenges, the participants recruited at Douglas College differed in a number of ways from either those recruited at Conestoga or those recruited in previous iterations of the program at Douglas. They were more barriered, lower skilled, and more distant from the labour market along a number of dimensions. In addition, because they were unlikely to be case-managed, they were also less likely to get wraparound supports (such as child care) from referral agents and less likely to be held accountable if they dropped out of the program. Indeed, as described below, Douglas College recruits were more likely to drop out of the program early than those at Conestoga College.

Program delivery and attrition

- Recruits were randomly assigned to either the control group, which received no further intervention, or to the program group, which received one or both components of the FWSP. The first component, ***Portfolio Development***, helped participants create an inventory of their Essential Skills, research skill requirements related to their target occupations, and build a

[1] Palameta, B., Nguyen, C., Hui, T. S.-w., & Gyarmati, D. (2017). *Foundations: 12-month impacts of a literacy and essential skills intervention for job seekers*. Ottawa, ON: Social Research and Demonstration Corporation.

realistic career action plan based on the match between *assessed* skill levels and *required* occupational skill levels. The second component, ***Skills Enhancement***, offered for those who needed it individually customized skill upgrading using occupationally relevant learning materials.

- For the Portfolio component of the program, an established curriculum created by Douglas College was used by all sites throughout the duration of the project. However, recruitment difficulties throughout the project meant that the Portfolio was often delivered with smaller group sizes than intended, making it more difficult for lower-skilled participants to develop a peer support network.
- After random assignment, attrition rates were between 15 to 20 per cent at each stage of the program. Of the 231 participants who were offered the program, about 20 per cent dropped out before even starting the Portfolio phase. Another 16 per cent left before completing their Portfolio development.
- The characteristics of those who dropped out of Portfolio were likely linked with recruitment challenges in several ways. For example, participants at Douglas College – largely recruited by program staff – were much more likely to drop out of the program before starting Portfolio development compared to participants with otherwise similar characteristics at Conestoga College, who were mostly case managed and referred by career/work coaches. Case managed clients are usually more engaged and feel more accountable because they will continue to rely on case managers for access to future programs and services, and program staff may use case workers as an additional channel to engage with participants.
- In addition, higher-need clients – those with lower levels of education, low literacy skills, and little work experience – were more likely than others to leave the program early, even though it was designed to benefit them the most. An explanation for this was provided by program staff, who cited smaller than usual Portfolio class sizes stemming from recruitment challenges, and the difficulty lower-skilled persons may have had engaging in such small groups.
- In some cases, Portfolio development seemed to be especially suitable for those with relatively high skills, for example those closer to the labour market but with an education barrier that prevents them from getting a job. These kinds of individuals may see Portfolio as a chance to focus on identifying and making plans for future education and training needed for their target occupations.
- In some cases participants may be "overqualified" for Portfolio development. For example, those who already has high levels of self-efficacy in their career decision-making and job search strategies at baseline were more likely to drop out, possibly because they perceived that the Portfolio was too basic. Identifying these individuals early and offering them an accelerated path to Skills Enhancement may be a key to maintaining their level of engagement.
- Unlike Portfolio development which used a national curriculum, Skills Enhancement was more individually customized and occupation focused. Though staff at all three sites met regularly to share ideas and resources, they also researched and developed their own materials. While the original budget allowed for only 50 per cent of Portfolio completers to go on to Skills

Enhancement, lower than planned recruitment numbers as well as attrition at the Portfolio stage meant that sites were able to recommend anyone who fell short of skill requirements for targeted occupations. Thus recommendation rates were close to 85 per cent.

- Some learners were selected into Skills Enhancement by design – for example, level 2 learners were recommended at higher rates than level 3 learners, reflecting the greater likelihood of gaps between current and required skill levels in the former group. However, others self-selected into Skills Enhancement by choice. For example, despite their greater need, those with level 1 skills were both less likely to be recommended to Skills Enhancement and less likely to enter the program if recommended. After completing 60 hours of Portfolio development, lower-skilled learners may find it difficult to engage in additional learning without further motivational or other supports.
- In some cases, groups that were ***most likely to be recommended*** for Skills Enhancement were ***least likely to actually start the program***. For example, recent immigrants were more likely to be recommended than established immigrants or non-immigrants, but less likely to enter the program after recommendation. Similarly, the unemployed were more likely to be recommended than those who had part-time jobs, but less likely to enter the program after recommendation. Inconsistencies between being recommended and actually entering the program suggest that in some cases a time lag between recommendation and program entry may result in potential drop-off among less confident or engaged learners.
- The current delivery model of the FWSP – unlike the model piloted for this research project – is focused on referrals from Work BC employment centres, and has integrated delivery of Portfolio and Skills Enhancement. This not only eliminates the time lag between distinct program phases during which learner motivation and confidence may lag, but also focuses on engaging learners who are accountable to their case workers.

Twelve-week program impacts

- Program impacts were estimated for i) the program group as a whole in relation to the control group, and ii) Skills Enhancement participants only, by applying a propensity score matching technique to construct a group of control participants with similar baseline characteristics. This allowed us to derive unbiased estimates of the impacts of Skills Enhancement on key 12-week outcomes such as career adaptability and Essential Skills gains.
- Impacts on career adaptability indicators such as career planning, career decision-making self-efficacy, job search clarity, and job search self-efficacy were large and statistically significant whether estimated for the program group as a whole or for Skills Enhancement participants in particular. Thus we can infer that, compared to the control group, FWSP participants made similarly large gains in a series of career adaptability indicators, whether they participated in Portfolio development only or whether they also took Skills Enhancement.
- This result is consistent with the idea that most of the impact on career adaptability took place while participants were developing their Essential Skill portfolios in relation to the skill requirements of targeted occupations, during the Portfolio phase of the FWSP.

- Impacts on Essential Skills were generally larger for Skills Enhancement participants than they were for the program group as a whole. Though numeracy impacts were statistically significant for both Skills Enhancement participants and the program group as a whole, they were larger in the former group. For example, Skills Enhancement participants experienced impacts of 22 points on numeracy scores, compared to 15 points for the program group as a whole.
- In addition, though impacts on document use and reading scores were not significantly different from zero for the program group as whole, they were large and statistically significant for Skills Enhancement participants – 14 points for document use and 12 points for reading. From these result, we can infer that impacts on document use and reading scores were largely confined to Skills Enhancement participants, and that the Portfolio portion of the program by itself was not likely to produce substantial gains in document use or reading.
- In general, as expected, gains in Essential Skills were driven by participation in Skills Enhancement, which was designed expressly to help participants improve their levels of Essential Skills and move them closer to the levels required for their target occupations.

Introduction

The Foundations Workplace Skills Project (FWSP), a three-year initiative led by the Training Group at Douglas College, British Columbia, uses a randomized control trial design to test: a) whether an Essential Skill based program model targeted specifically to meet the needs of low-skilled job seekers can be successfully implemented across three sites nationally, and b) what impacts the program may have on a variety of outcomes, both intermediate (e.g., skill and career adaptability gains) and longer-term (e.g., participation in further training and labour market advancement).

This evaluation of the FWSP is unique in that it is the first test of a model targeting the Essential Skills of job seekers rather than employees. Two decades of workplace Literacy & Essential Skills (LES) assessment and research have shown that a considerable portion of the Canadian workforce score below levels thought necessary to function effectively on the job.

Recent years have seen a significant shift in attention and government funding from credential-based training for the unemployed towards workplace-based LES training interventions. There is a growing body of evidence – most notably from the UPSKILL national demonstration project – that LES training is most effective when it is delivered in a contextualized occupational-relevant way that is aligned with business needs.

The success of workplace based LES interventions and concurrent shift in funding and delivery models contributes to a service provision gap for job seekers – particularly with respect to occupational-relevant LES training. Few employment programs have used an Essential Skills framework to assess occupation-specific skill gaps among the unemployed, and as a result there has been a lack of targeted services focused on occupation-oriented skills upgrading for job seekers.

In addition to the service provision gap, there is also a research gap in terms of understanding the possible causal effects of raising Essential Skills levels among the unemployed. Though research has shown that higher literacy scores are correlated with shorter unemployment spells, higher earnings, and several other desirable outcomes, there has been no experimental or even program evaluation data showing that interventions to raise Essential Skill levels lead to improved outcomes for job seekers.

The FWSP aims to address both these gaps by: a) implementing a multi-stage training model that embeds Essential Skills assessment and upgrading within career development services, by first helping unemployed clients create an inventory of their own skills while also understanding the skill requirements of their targeted occupations, then developing individually-customized, occupationally-relevant plans to close the gap between current and required skills; and b) evaluating, in the context of a randomized field experiment, whether this combination of services improves client skills levels, career decision making and job search self-efficacy, while leading to improved participation in further training, and ultimately higher quality job matches with better prospects for career advancement and job stability.

This report focuses on the implementation of the FWSP, with a detailed examination of the core components of the program model and the effectiveness with which they were delivered as

intended across the different sites, along with a summary of challenges encountered, lessons learned, and implications for the design of future iterations of the program.

It begins with a summary of recruitment and participant characteristics at the three participating colleges – Douglas College (British Columbia), Conestoga College (Ontario), and College of the North Atlantic (Newfoundland) – followed by a brief description of the research process, and a detailed examination of delivery and participant attrition across the different stages of the program. The report concludes by reviewing the 12-week impacts of the program on Essential Skill scores and career adaptability indicators, and examines how these impacts may vary according to exposure to different elements of the program.

Recruitment and participant characteristics

Recruitment methods and challenges

The original recruitment target for the FWSP was 1,000 participants (500 program group and 500 control group). The plan was for Douglas College to recruit 700, Conestoga College to recruit 200 and College of the North Atlantic to recruit 100. Each college was in charge of running their local recruitment campaign. For each site the hope was to rely heavily on referrals from community agencies, career coaches and centres, and local government offices which work with individuals on Income Assistance (IA) and Employment Insurance (EI). These referrals were to be supplemented by outreach through social media and word of mouth.

The recruitment plans quickly encountered two primary challenges:

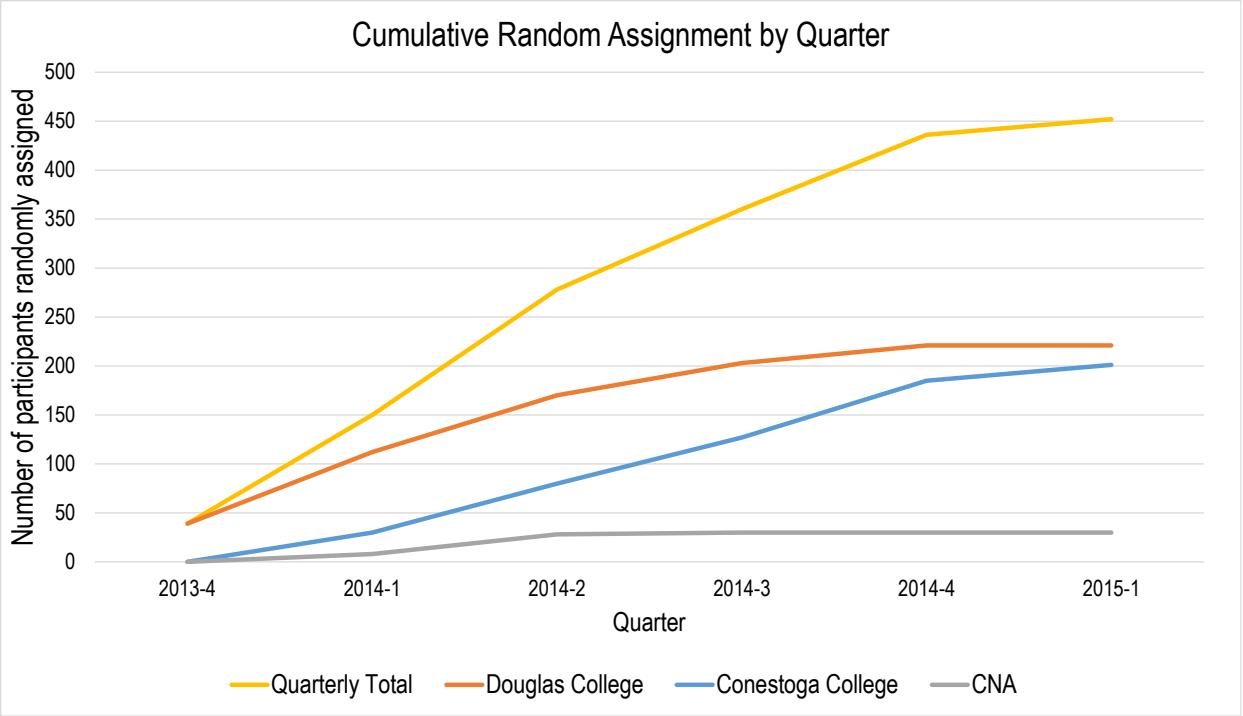
The first challenge had to do with uncertainty around how the FWSP was to be classified with regard to EI clients. To the extent that the FWSP was perceived as a training rather than an employment assistance program, it was thought EI clients would need to seek approval under section 25 of the EI Act before being referred into the FWSP. This would have been a significant deterrent, especially in Ontario where approval decisions often take 28 days or more. There was some uncertainty as to whether participants could self-refer without their EI benefits being jeopardized.

This led to delays early in the project as staff focused recruitment away from EI clients pending resolution of this issue. In Ontario, the FWSP never received a full exemption from section 25 requirements – instead a satisfactory workaround was put in place whereby the FWSP was repositioned as an employment assistance/light intervention (less than 10 hours per week) program, and as such did not require section 25 training approval for EI recipients.

The second, and possibly larger issue was the change in the funding model for British Columbia Employment Centres. In April of 2012, BC's Ministry of Social Development launched the new Employment Program of British Columbia (EPBC). Integrated service delivery was entrusted to Employment Service Centres (ESCs) throughout the province. As the FWSP recruitment was happening, staff at BC employment services centres were only beginning to adjust to the new system and the associated performance management and billing system. As a result, the number of referrals that ESCs made to programs outside of service centres dropped to less than half the level it was prior to the introduction of the EPBC. For the FWSP, this meant relatively few referrals from ESCs and a greater reliance on connections with community agencies working outside the EPBC framework. As discussed at greater length later, this likely led to an atypical cohort of participants being enrolled at Douglas College.

Perhaps as a result of lack of a reliable single source of referral, Douglas's recruitment numbers started to wane in the latter two quarters of the 2014 recruitment period, while Conestoga's continued at a steady pace throughout the year (Figure 1).

Figure 1 Recruitment over time, by site and quarter



Source: SRDC random assignment database.

Due to the recruitment challenges at Douglas College, and the fact that the pace of recruitment was slowing in the second quarter of 2014, a decision was made to shift more of the project resources to Conestoga College starting in the summer of 2014. As well, recruitment was expanded at Conestoga so that they could run simultaneously at two locations starting in the fall of 2014, and continue intake into January 2015, while Douglas College closed off their intake in December 2014.

The final results of the recruitment were 221 participants at Douglas College, 201 at Conestoga College, and 30 at College of the North Atlantic.

A summary of the varying methods of recruitment is illustrated in Table 1. Conestoga relied primarily on their in-house career centre and connections with career/work coaches, and to a lesser extent on community agencies. In contrast, the College of the North Atlantic relied primarily on community agencies to recruit participants, most of whom were on income assistance.

In contrast to previous iterations of the program, Douglas College was unable to rely on caseworker referrals and, as a result of the transformation in British Columbia's employment services, was only able to recruit a small number of participants from Work BC centres. As a result, recruitment relied on more of a mixed bag of referral sources, including English as a Second Language (ESL) centres, project staff initiatives, and word of mouth.

Table 1 Recruitment sources of referral, by site (%)

	Douglas College (N=99)	Conestoga College (N=201)	College of the North Atlantic (N=28)
Career coach/work coach	0.0	62.7	0.0
Career centre	0.0	7.5	0.0
Community agency	24.2	8.0	75.0
ESL/English language centre	18.2	2.0	0.0
Government agency/office (e.g. Work BC)	20.2	0.5	14.3
Project staff (venue undefined)	12.1	1.0	0.0
Website/social media	5.1	0.0	3.6
Word of Mouth	8.1	7.5	0.0
Work fair/presentation	3.0	0.0	0.0
Other	9.1	11.0	7.1

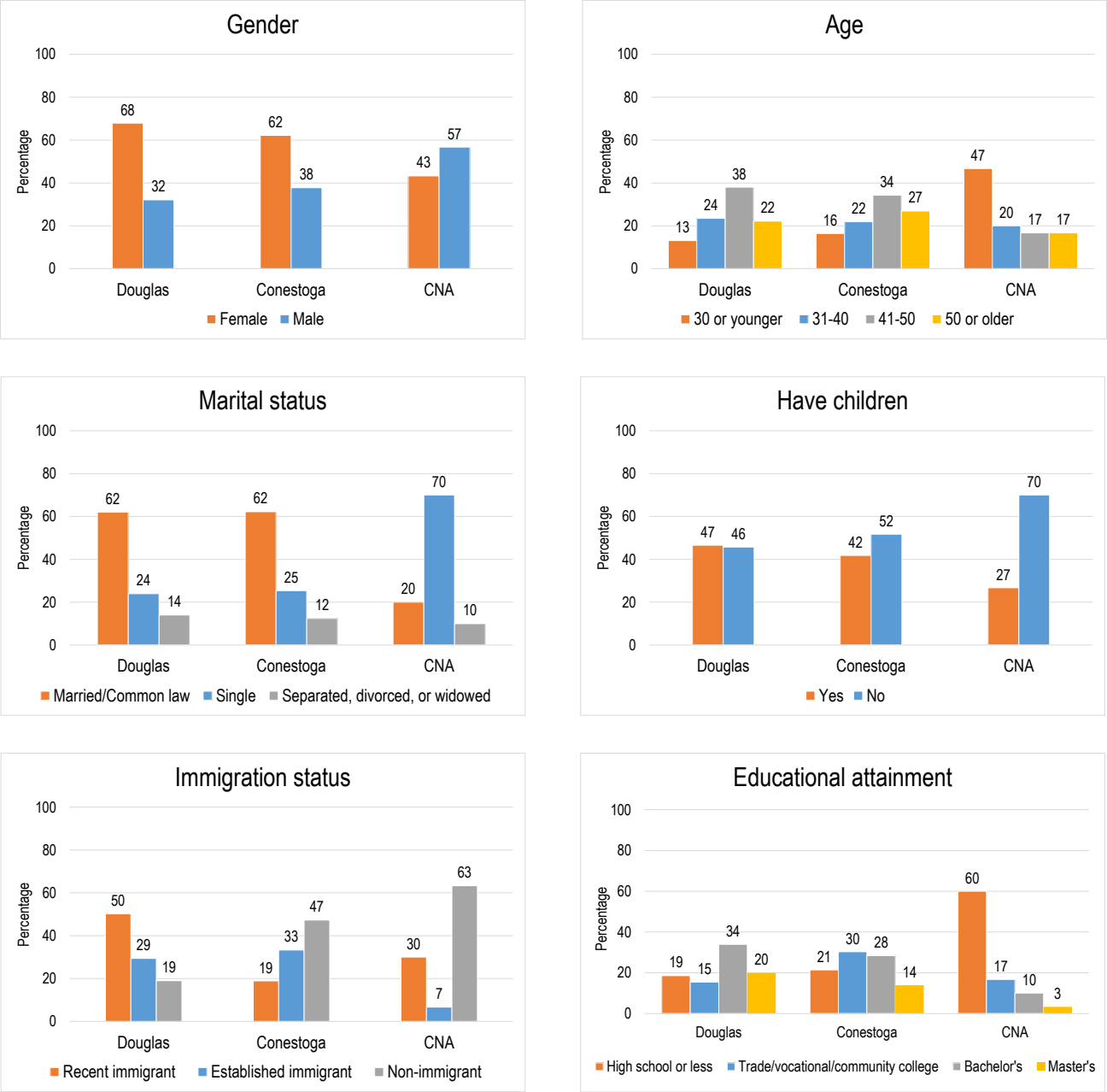
Source: Calculations by SRDC based on information entered in the Participant Management Information System (PMIS).

Note: Sample sizes only include those cases with an entry in the PMIS; a high number of blank cases for Douglas College reduced the sample to 99.

Baseline characteristics, by site

A summary of baseline demographic characteristics of study participants at each of the three sites is illustrated in Figure 2 below. Full results are included in Appendix A, Table 4.

Figure 2 Demographic characteristics



Source: SRDC baseline survey.

Note: Columns will not always add up to 100 per cent because of missing values.

The majority of participants at both Douglas College (DC) and Conestoga College (CC) were female, married, and over 30 years of age. Over 40 per cent had children. In contrast, participants at College of the North Atlantic (CNA) were more likely to be younger (almost half were under 30), single with no children, and male.

Close to 80 per cent of DC participants were immigrants, most of which were recent immigrants. CC also had a substantial proportion of immigrants among its participants (52 per cent), though most of these were established rather than recent immigrants. Over one third of CNA participants were immigrants, most recent.

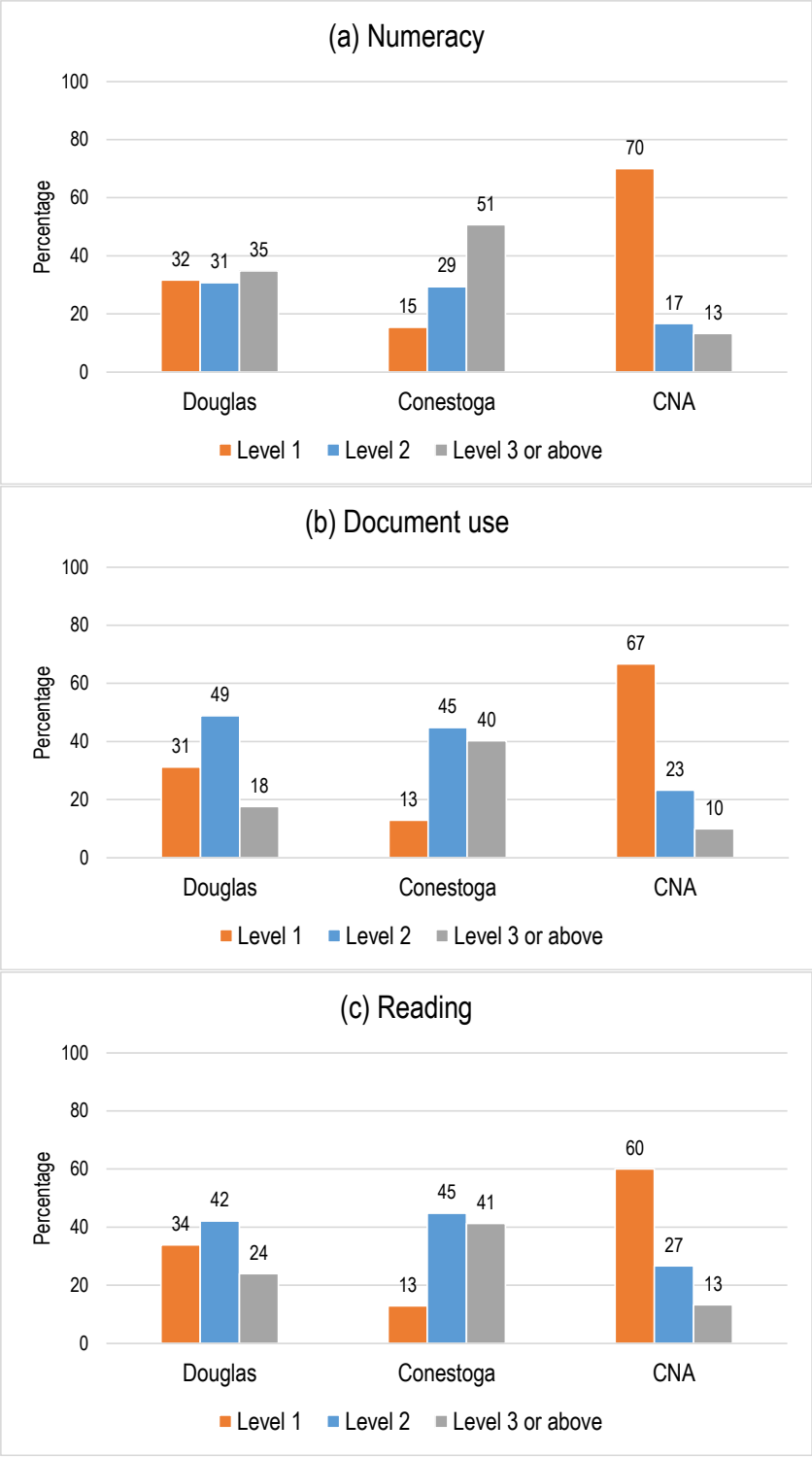
In terms of human capital, more than three-quarters of DC and CC participants had at least some form of post-secondary credential (with a higher proportion of trades/college credentials at CC, and university degrees at DC). In contrast, CNA participants were more likely to have only a high school diploma or less.

Differences in educational attainment between sites were somewhat consistent with differences in Essential Skill scores and levels (illustrated in Figure 3).

The majority of CNA participants were at level 1 for all three skills (numeracy, document use, and reading), while the other two colleges had substantial proportions of participants at level 2 or even level 3. This was especially true at CC, where over 40 per cent of participants scored at level 3 or above for document use and reading, and over 50 per cent scored at level 3 or above for numeracy.

However, despite having the highest levels of postsecondary educational attainment, DC also had a relatively high proportion of participants at level 1 – about one-third in all three measured skills, compared to 15 per cent or less of CC participants.

Figure 3 Essential skills at baseline

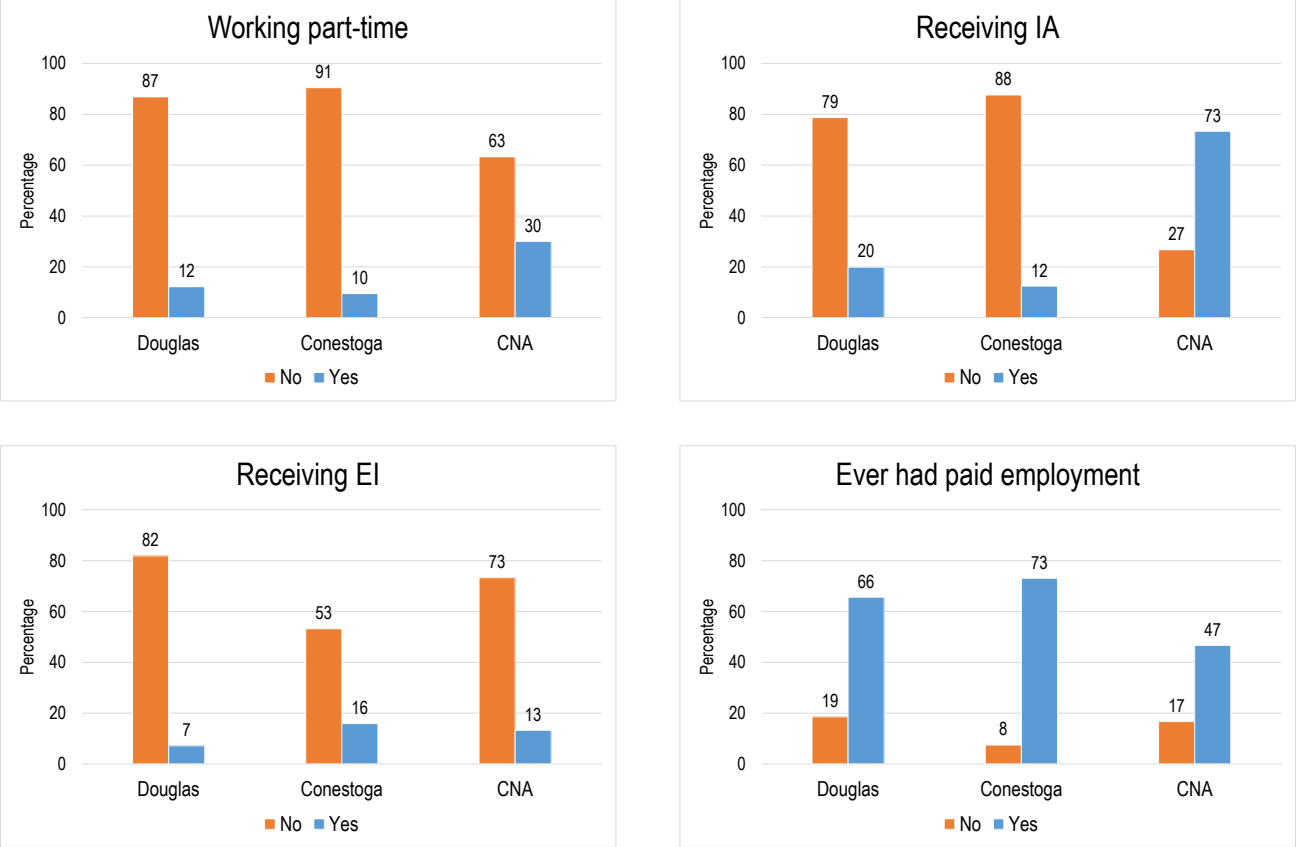


Source: SRDC baseline survey.

Note: Columns do not always add up to 100 per cent because of missing values.

Furthermore, several indicators reveal that DC participants were more distant from the labour market than those at CC, illustrated in Figure 4.

Figure 4 Distance from the labour market



Source: SRDC baseline survey.

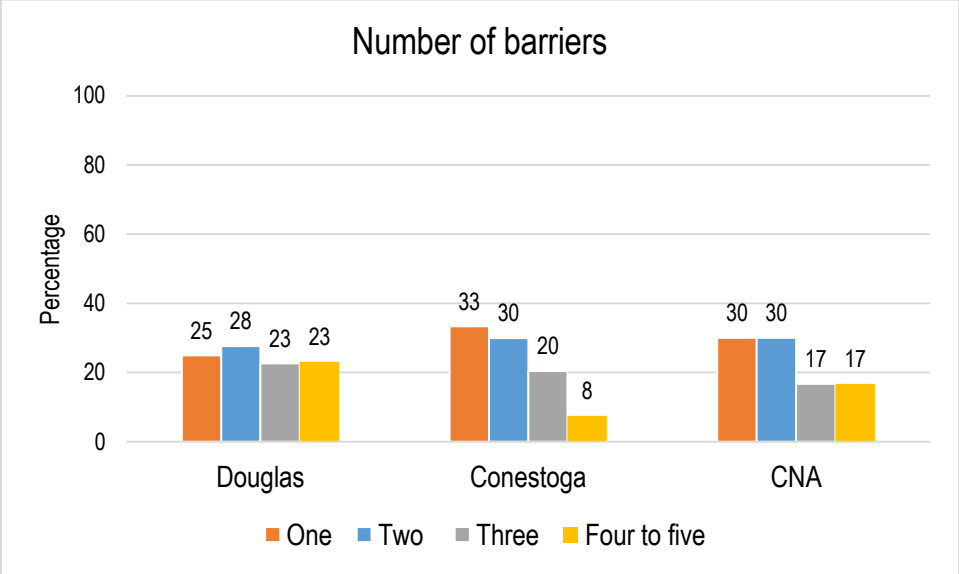
Note: Columns do not always add up to 100 per cent because of missing values.

Though the vast majority (about 90 per cent) of DC and CC participants were out of work at baseline, those at DC were more likely to be receiving Income Assistance (20 per cent vs. 12 per cent at CC), and less likely to be receiving EI (only 7 per cent compared to 16 per cent at CC).

In terms of past employment, DC participants were more similar to those at CNA than those at CC. DC participants worked an average of only 12 months out of the past 36 – only a little bit higher than those at CNA (10 out of 36) and much lower than those at CC (20 out of 36). Nineteen per cent of DC participants (and 17 per cent of CNA participants) had never been employed, compared to only 8 per cent of CC participants.

In addition, as illustrated in Figure 5, a large proportion of DC participants were relatively highly barriered, with 46 per cent reporting 3 or more barriers to finding or keeping a job – a higher proportion than either CC (28 per cent) or CNA (34 per cent).

Figure 5 Barriers to finding or keeping a job

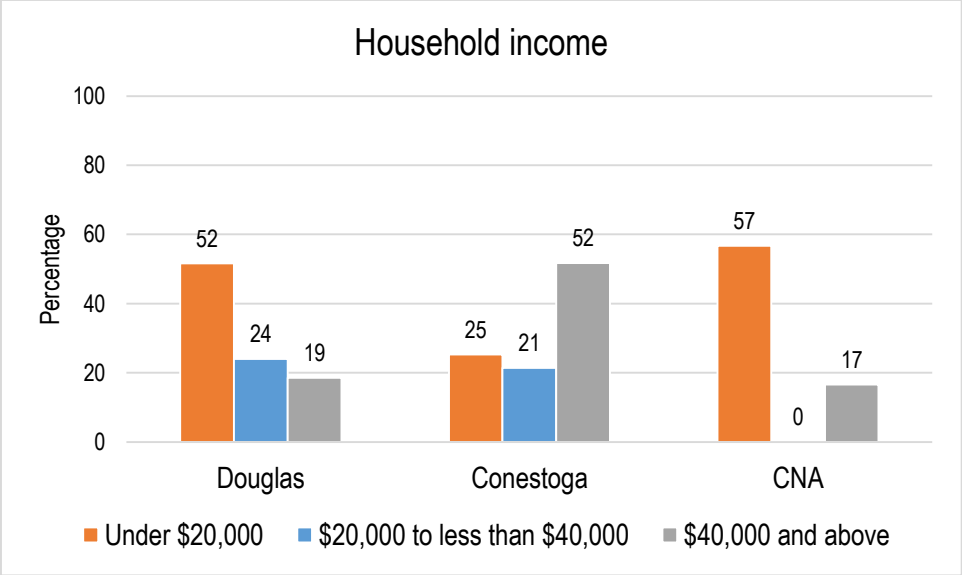


Source: SRDC baseline survey.

Note: Columns will not always add up to 100 per cent because of missing values.

In terms of financial hardship, more than half of CNA and DC participants lived in households making less than $20,000 of total income at baseline (see Figure 6). In contrast more than half of CC participants lived in households making more than $40,000 of total income.

Figure 6 Household income level



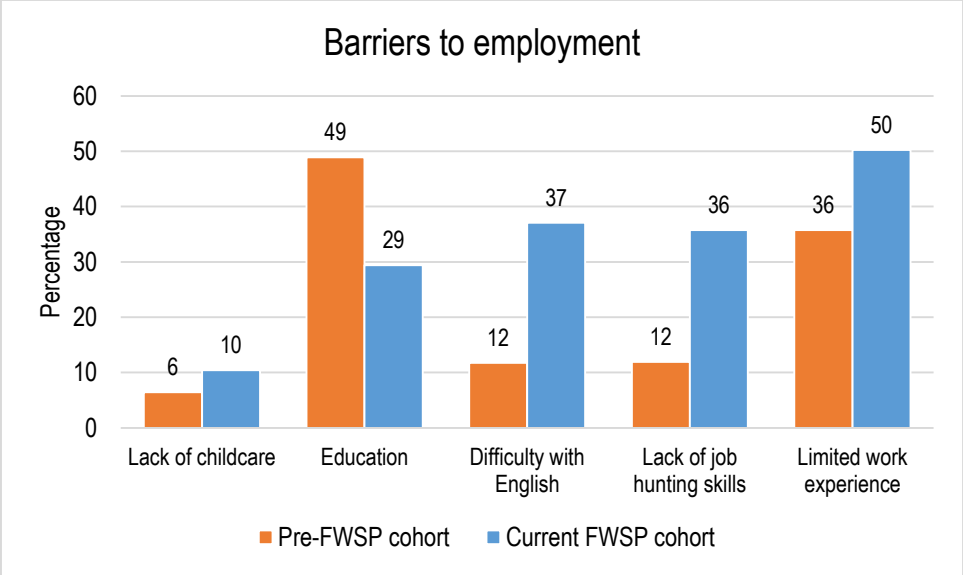
Source: SRDC baseline survey.

Note: Columns will not always add up to 100 per cent because of missing values.

Baseline characteristics of current Douglas College cohort, compared to previous cohorts

The baseline survey collected information on a series of possible barriers to participants finding and keeping a job. Data on barriers to employment had also been collected during the application process in previous iterations of the Foundations program at Douglas College, so it was possible to compare current recruits with previous cohorts on these measures. Current and past participants at Douglas College differed significantly in a number of barriers, illustrated in Figure 7. Complete results are presented in Appendix B, Table 5.

Figure 7 Barriers to employment among current and past participants at Douglas College



Sources: FWSP baseline survey and Douglas College administrative data on previous Foundations projects.

Compared to past cohorts, recruits at Douglas had significantly more barriers, especially in the areas of English language skills, job hunting skills, work experience, and child care. They also had significantly fewer barriers related to education than previous cohorts.

The differences in barriers to employment between current and past recruits can be tied to the unique recruitment challenges associated with this project, notably limited access to what had once been a regular stream of case-managed clients from Service Canada centres. As a result, current recruits were more likely to be immigrants, with relatively high educational attainment but lower language skills and greater distance from the labour market than past recruits.

In addition, because current recruits at DC were less likely to be case-managed, they were less likely to get wraparound supports (such as child care) from referral agents and less likely to be held accountable if they dropped out of the program. Indeed, as will be described at greater length later in the report, DC recruits were more likely to drop out of the program than those at CC.

The research process: Intake, random assignment, and data collection

Intake and baseline

People who were interested in hearing more about the FWSP and possibly applying were directed to attend an intake session at their local college or sometimes a satellite location.[2] During this session which usually lasted about 2.5 hours participants had the opportunity to learn more information about the program and complete the intake process.

The first component of the session was a presentation by a local FWSP staff member who explained key elements of the research and the program. Participants were told that there was a 50/50 chance of being in either the program or the control group (sometimes referred to as the comparison group). At that point, if participants were comfortable joining the project they were asked to review and sign the informed consent which set out in writing all of the key elements of the research project.

A considerable portion of the time at the intake session was used to complete two baseline data collection instruments. The first instrument was a baseline survey, which had two primary research objectives. The first was to obtain starting values for key outcome measures such as career adaptability indicators, so that the study could measure changes in these indicators over time rather than relying on single point-in-time "snapshots". The second was to obtain detailed participant characteristics such as demographics and work history, which are then used to answer key research questions on program attrition (e.g., what kinds of participants are more likely to complete the program and what kinds are more likely to drop out?) and effectiveness (e.g., what are the characteristics of participants who are most likely to benefit from the program?).

The second research instrument was an online Essential Skills Assessment. The assessment used a tool developed by the Essential Skills Group, and measured participants' skill level in each of three domains: reading, document use, and numeracy.

The reading and document use assessments consisted of 15 questions each, organized in three "testlets" of 5 questions each. These assessments were self-levelling, in the sense that while everybody started with a testlet of five level 2 questions, the levels of subsequent questions were dependent on performance in the previous testlet. For example, participants who scored three or fewer correct answers out of five on the first testlet were subsequently directed to a set of five level 1 questions, while those who scored four out of five correct stayed at level 2, and those who scored five out of five correct moved to level 3 (see Appendix C). The numeracy assessment, on the other hand, was not self-levelling. It consisted of six math sub-domains of five questions each,

[2] Sometimes, particularly at Conestoga College, this process was divided into two sessions. The first session was an information session to learn about the project while the second session was an application session to complete the consent, survey and assessment.

for a total of 30 questions. All assessments were scored based on the International Adult Literacy Survey (IALS) 500-point scoring system.

In addition to being used for research purposes, the assessments allowed program staff to debrief participants in the program group on their scores as part of the portfolio development portion of the program.

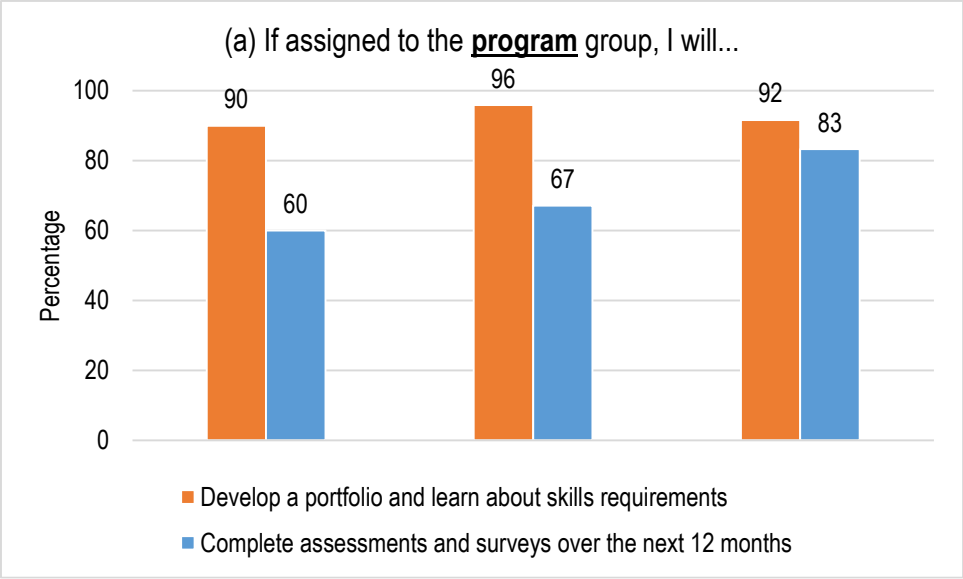
Finally, near the end of the intake session participants were informed whether they were assigned to the either the program or the control group. SRDC designed a secure online portal where staff could obtain each individual's random assignment result and share it with them. The system had several built in protections to ensure that random assignment could not be manipulated by either the staff or the participant.

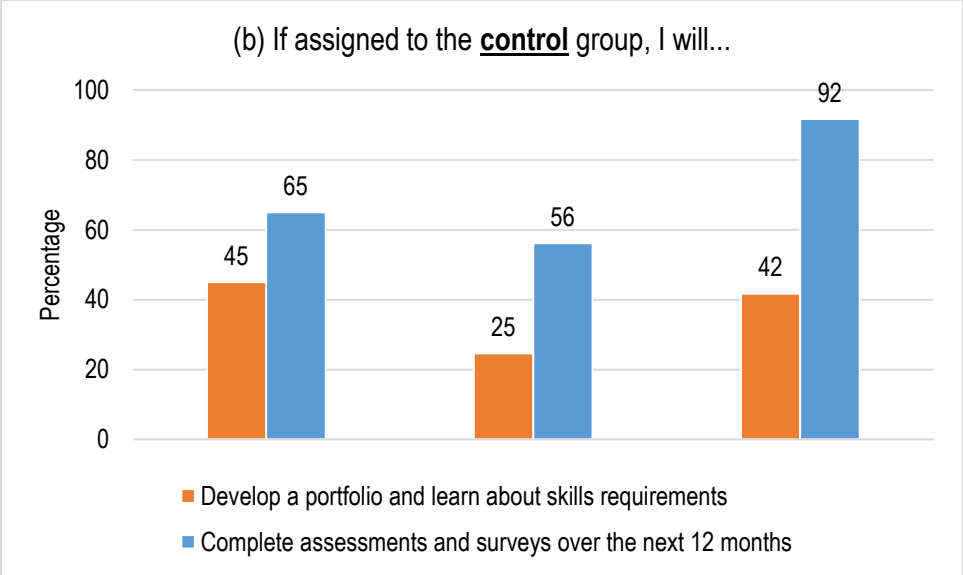
Participant understanding of research and program objectives and activities

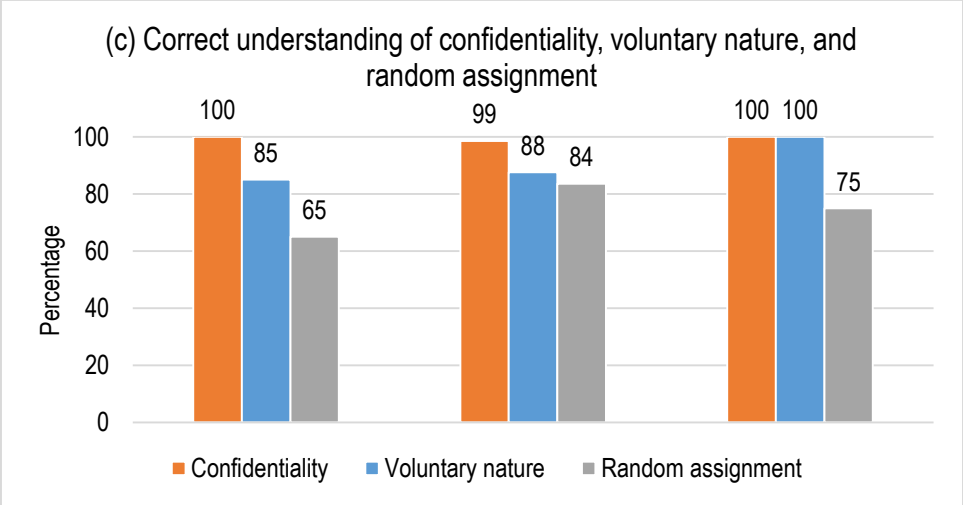
In order to receive feedback on the intake process, a subsample of participants were asked to complete a short survey near the end of intake session. The first section of the survey asked a series of factual questions to assess participant understanding of the project. As shown in Figure 8, overall the vast majority of participants were able to understand the key aspects of the program. They were able to understand that the program group would develop a portfolio and learn about skills requirements, that information would be kept confidential, and that participation was voluntary.

However, a significant minority of participants seemed to misunderstand the nature of the control group, with about a third saying that if they were assigned to the control group they would develop a portfolio and learn about skill requirements.

Figure 8 Understanding of the project







Source: Intake session exit survey.

In the second section of the survey participants were asked for their views on the intake session. As shown in Table 7 in Appendix D, most participants found the intake session clear and they were comfortable signing the consent.

Participants generally agreed the baseline survey was easy to complete, but found the assessment harder to complete which is not surprising since the assessment was meant to determine the limits of their abilities.

Follow-up

Approximately 12 weeks after random assignment participants were asked to complete the first wave of follow-up research. The follow-up Essential Skills Assessment was identical to the baseline while the follow-up survey obtained updated measures of key outcome variables as well as, for the program group, measures of program satisfaction. Usually the 12-week follow-up research was completed in a computer lab at the college; although under extenuating circumstances participants were given the chance to complete it at home or on another computer of their choosing. Upon completion members of the control group were paid $50 however, there was no remuneration for the program group.

Participants were asked to complete their final survey approximately 12 months after random assignment. For this survey participants were first emailed a URL for an online survey. If participants failed to respond within about two weeks, they were called by telephone. All participants (program and control) who completed the 12-month survey received $50.

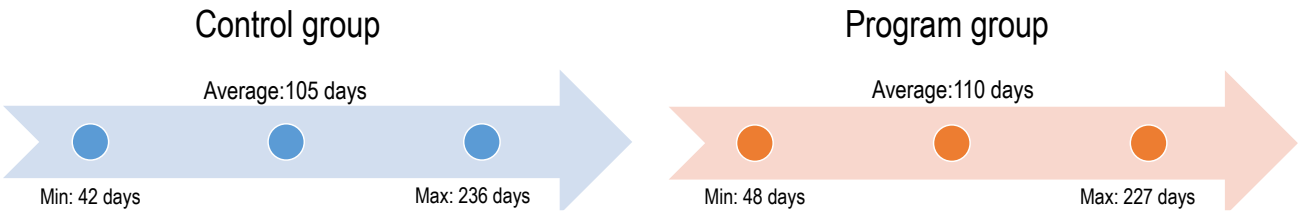
The final major data source for this project was the participant management information system. Each site used a participant database to track program group activities, including participation in and completion of the first phase of the program (portfolio development), recommendation and transition to the second phase (skills enhancement), and total hours spent and main Essential Skills focused on during skills enhancement.

Time between random assignment and follow-up

As noted above, the research design called for completing the second survey and skills assessment 12 weeks after random assignment; however, as with many research projects there was a difference for some individuals between the target date and the actual date of follow-up. There were several reasons for this, including difficulty of contacting some participants and delays between random assignment and program start date for some members of the program group.

As illustrated in Figure 9, the timing of the 12-week survey and assessment for the program group ranged from a minimum of 48 days after random assignment to a maximum of 227 days. The timing of follow-ups for the control group was reasonably well aligned with that of the program group, in terms of both range (42 days to 236 days) and average time between random assignment and follow-up (105 days for the control group compared to 110 days for the program group). The fact that there is no large discrepancy in follow-up timelines between the groups increases our level of confidence in comparing their results.

Figure 9 Follow-up survey and assessment timelines



Program delivery and attrition

Program components

The program model of the FWSP was divided into two components:

i) Portfolio development and;

ii) Skills Enhancement.

Portfolio development was slated to take place over two weeks, with approximately 60 hours of classroom learning. The goal of this stage of the program was to provide an environment where participants could:

- Identify and document their Essential Skills (including formal assessments of reading, document use, and numeracy);
- Research skill requirements related to their targeted occupations; and
- Build a realistic career action plan based on the match between *assessed* skill levels and *required* occupational skill levels.

The program model was designed to use Portfolio information to identify participants whose skills were below but within reach of the levels needed for their target occupations. These kinds of participants would then be recommended to continue to the Skills Enhancement portion of the program.

Skills Enhancement was intended to be more targeted and individualized than Portfolio development. It was intended to take place over 2 to 10 weeks, depending on learner needs, and offer the following core elements:

- Individual learning plans designed to address each participant's specific skill needs;
- Mixed learning environments consisting of group sessions, one-to-one classes, and self-directed learning periods;
- Learning materials that were contextually relevant to learners' chosen occupations; and
- Follow-up assessments and debrief at the end of training.

Program and research participation

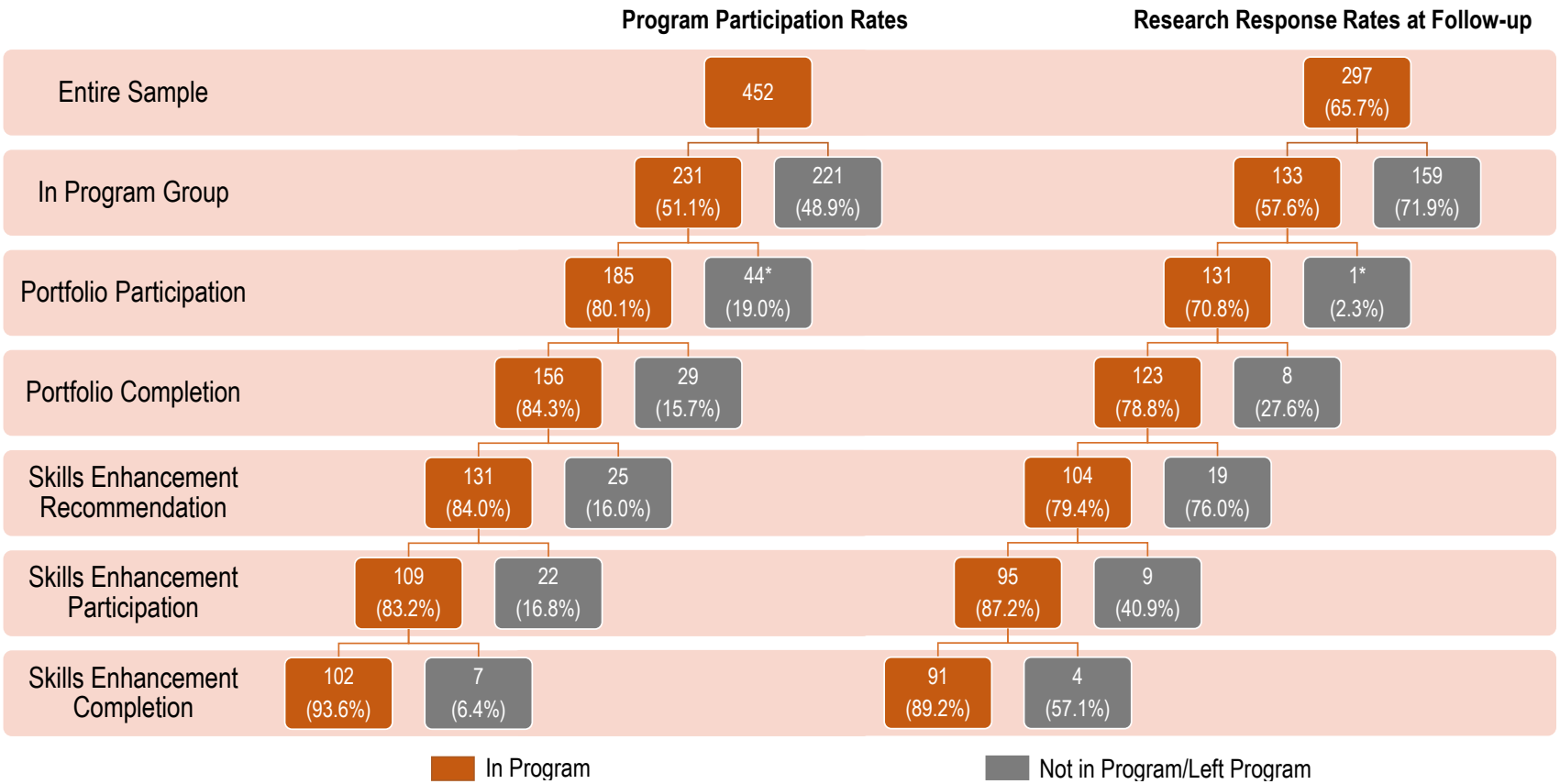
Figure 10 shows the overall flow of participants through the stages of the program, with response rates to follow-up research at each stage.

In the left panel, starting from random assignment and following through to the completion of Skills Enhancement, the orange boxes depict those who entered the program group and completed each stage of the program, whereas the grey boxes show those who did not enter the program (i.e., the control group) as well as those who left the program at each stage.

The right panel shows the 12-week follow-up response rates among those who stayed in the program (orange boxes) and those who either never entered the program or left the program (grey boxes).

For example, the second row shows that roughly 51 per cent of participants were assigned to the program group (orange box) and that the overall follow-up response rate of these participants was 57.6 per cent. In contrast, the response rate of those assigned to the control group was 71.9 per cent, approximately 14 percentage points higher than program group. There may be several reasons for this discrepancy, one being that, as explained further below, those program group members who left prior to completing the Portfolio were very difficult to reach for the follow-up. Another reason may be that the $50 incentive for the control group may have encouraged them to respond at high rates.

Figure 10 Participation and response rates



Source: Project management information system.

***Note**: The Portfolio status of two respondents in the program group was not recorded. Results from these respondents were subsequently excluded from the analysis.

As shown in rows three and below of the left panel of Figure 10, after random assignment attrition rates were between 15 to 20 per cent at each stage of the program. Specifically, out of 231 participants who were offered the program, about 80 per cent took it up and started to develop their Portfolio. Of those who started, 84 per cent completed their Portfolio development, and 84 per cent of these individuals got recommended to Skills Enhancement training. Of the 131 participants who received this recommendation, 83 per cent followed through and started their skills training. Once started, only 6 per cent of participants at this stage failed to finish the Skills Enhancement component of the program.

With respect to the 12-week follow-up, the right panel of Figure 10 shows that the response rates of those who left the program were generally much lower than those who stayed in the program. For example, out of the 44 program group members who did not start the program, only one completed the follow-up research. This corresponds to a 2.3 per cent response rate, much lower than the 70.8 per cent response rate of those who started the program. Similarly, the response rate among the 29 people who started but failed to complete the Portfolio was only 27.6 per cent, compared to 78.8 per cent among those who completed the Portfolio component.

The low response rates among those who left the program early makes it difficult to assess potential program impacts on this subpopulation. However, the generally high response rates among those who went on to Skills Enhancement means that we can investigate the impacts of the program on those who participated most intensively. We return to this question later in the report.

For now, however, we focus on identifying potential reasons behind participants leaving the program, by applying multivariate analysis to examine the links between attrition and individual characteristics. This analysis gives a general idea of the extent to which attrition was non-random, i.e. more common among certain kinds of people than others. Understanding the characteristics of those who leave allows us to consider questions of how well the program was aligned with client needs, and sets the stage for interpretation of follow-up results.

The next sections examine in detail the two components of the program – Portfolio and Skills Enhancement – focusing on i) the extent to which what was delivered in each component was consistent with the program model (program fidelity), and ii) the characteristics of those who left without completing each component.

Portfolio

What was delivered?

Interviews with project staff were conducted to gain further understanding of how the program was actually delivered on the ground, and whether delivery was consistent with the intended program model. Project staff also shared their thoughts on the effectiveness as well as the challenges associated with implementing the program.

For the Portfolio component, an established curriculum was created by Douglas College and used by all sites throughout the duration of the project. Instructors made minor modifications to the

curriculum, but all key elements of the training were preserved. The two-week length was maintained by all three sites.

Portfolio development was intended to use an Essential Skills framework to help shape an existing career path to a target occupation, rather than to help identify a new career path. Thus project staff found that Portfolio development worked best for participants who came into the program with a target occupation. Participants who entered without a specific career goal found the program less helpful.

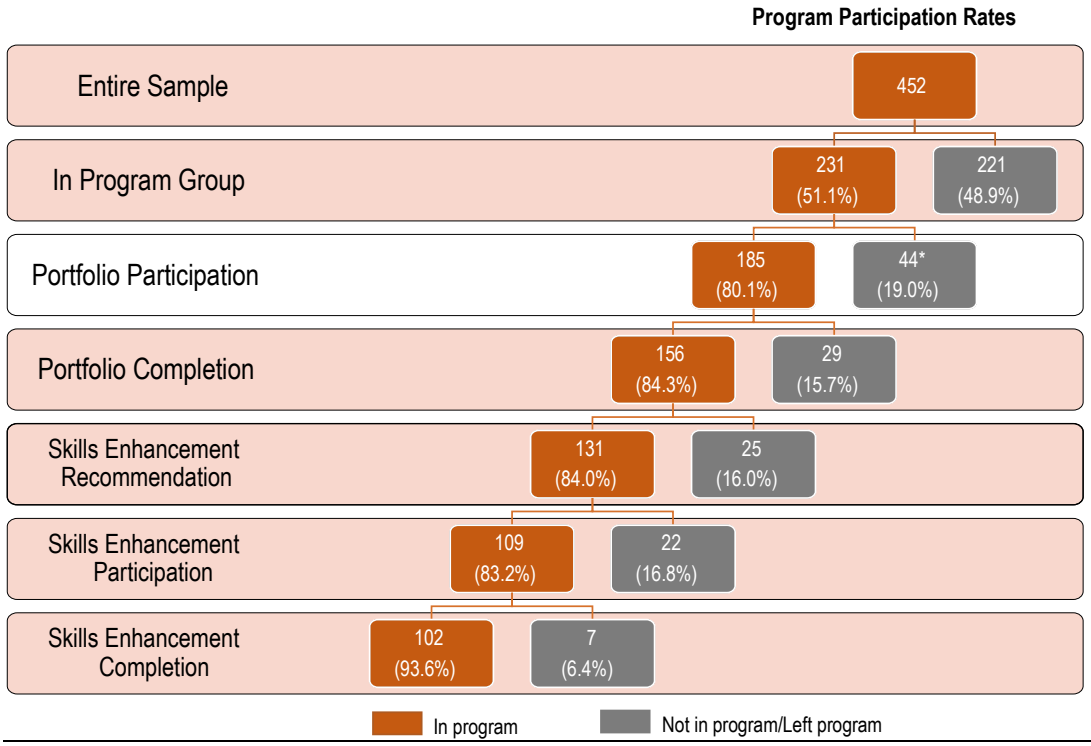
The Portfolio curriculum was designed to be delivered in a group setting (with a targeted number of between 8 and 12 people per group). Recruitment difficulties at certain times and locations throughout the project meant that the Portfolio was often delivered with smaller group sizes. This may have affected the dynamics of group interactions. For example, staff indicated that with smaller groups it was more difficult to develop a peer support network where you can see that a number of others are "in the same boat." Peer support can help participants can gain confidence in their job search activities.

The next two sections discuss participant characteristics associated with 1) failure to start Portfolio development, and 2) failure to complete Portfolio development once started.

Failure to start Portfolio development

Of the participants who were randomly assigned to the program group, 44 or 19 per cent dropped out before starting the Portfolio component (Figure 11).

Figure 11 Portfolio participation

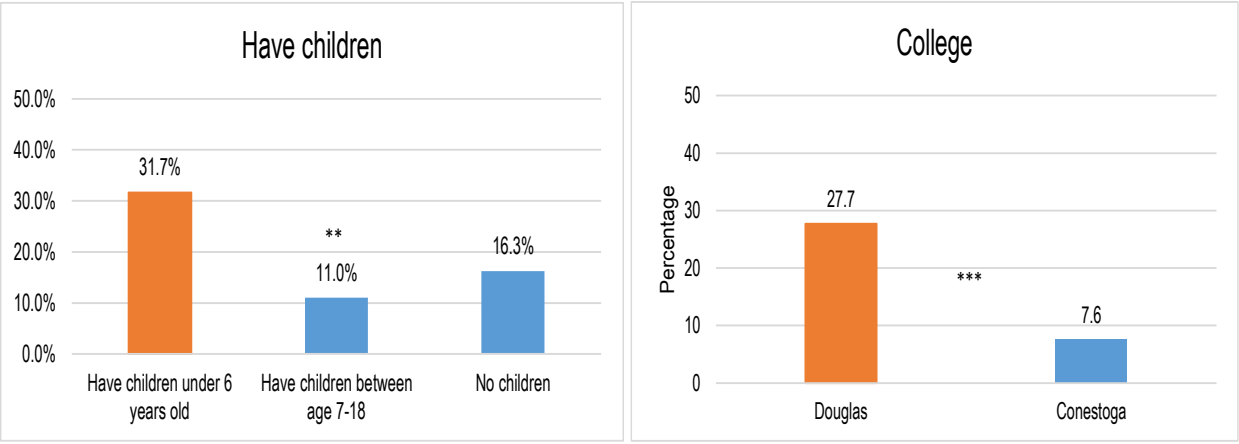


Multivariate regression was used to examine possible links between dropping out of the program and each of the following indicators, while holding all other indicators constant. This technique allowed us to, for example, examine whether colleges had different rates of participant drop-out while controlling for any differences between colleges in participant demographic profile, distance from labour market, Essential Skills, etc.

- **College/sites**;
- **Demographic characteristics**: gender, age, marital status, presence of children in household, immigration status, highest level of education, and household income;
- **Distance from the labour market**: measured via indicators of receiving Employment Insurance (EI) and/or Income Assistance (IA), having a part-time job at time of program, and the total number of months worked in the past three years;
- **Barriers to finding or keeping a job**: total number of barriers, and presence of specific barriers;
- **Baseline essential skills**: document use, reading, and numeracy scores and levels; and
- **Baseline career adaptability**: career decision-making self-efficacy and job search self-efficacy scores.

The multivariate analysis revealed that those with young children were less likely to start the program, compared to participants with similar characteristics who had older children (Figure 12). As a result of the recruitment challenges discussed earlier, many participants would not have been attached to a case manager and so would have found it difficult to access supports for child care. This may have caused some to fail to take up the program offer.

Figure 12 Failure to start Portfolio (%) by characteristic



Sources: Baseline survey and project management information system.

Note: Statistically significant differences between the reference category (orange bar) and other categories (blue bars) are indicated by the following: * denotes that the difference is statistically significant at the 10% level, ** at 5%, and *** at 1%.

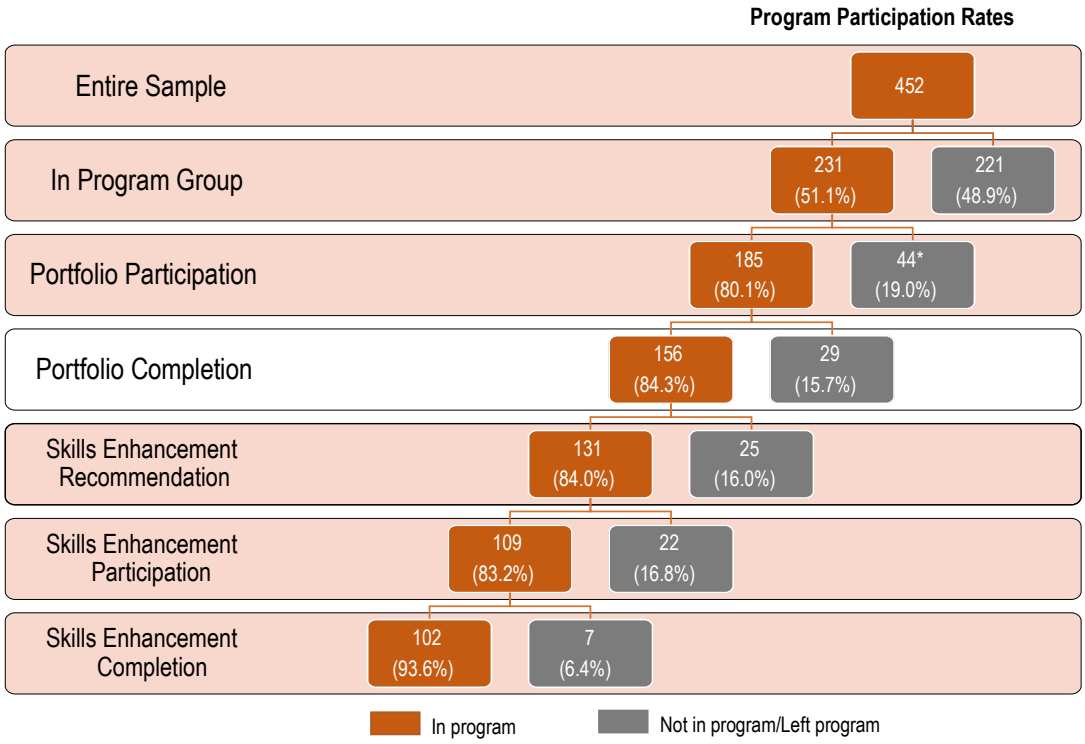
Figure 12 also illustrates that participants at Douglas College were 20 percentage points more likely to drop out of the program before starting Portfolio development, compared to otherwise identical participants at Conestoga College.

In light of recruitment challenges, the relatively low take-up rate at Douglas College was unsurprising. Unlike participants at Douglas College, who were largely recruited by program staff, most of those at Conestoga were referred by career/work coaches who acted as case managers. Case-managed clients typically have higher levels of engagement and a greater sense of accountability because they will continue to rely on case managers for access to future programs and services. In addition case workers provide an additional channel through which FWSP program staff could engage with clients. As a result, participants at Conestoga College were likely more motivated and easier to engage in terms of taking up the program offer.

Failure to complete Portfolio development

Of the 185 participants who took up the program and started Portfolio development, 29 or 16 per cent left before completing the Portfolio component (Figure 13).

Figure 13 Portfolio completion

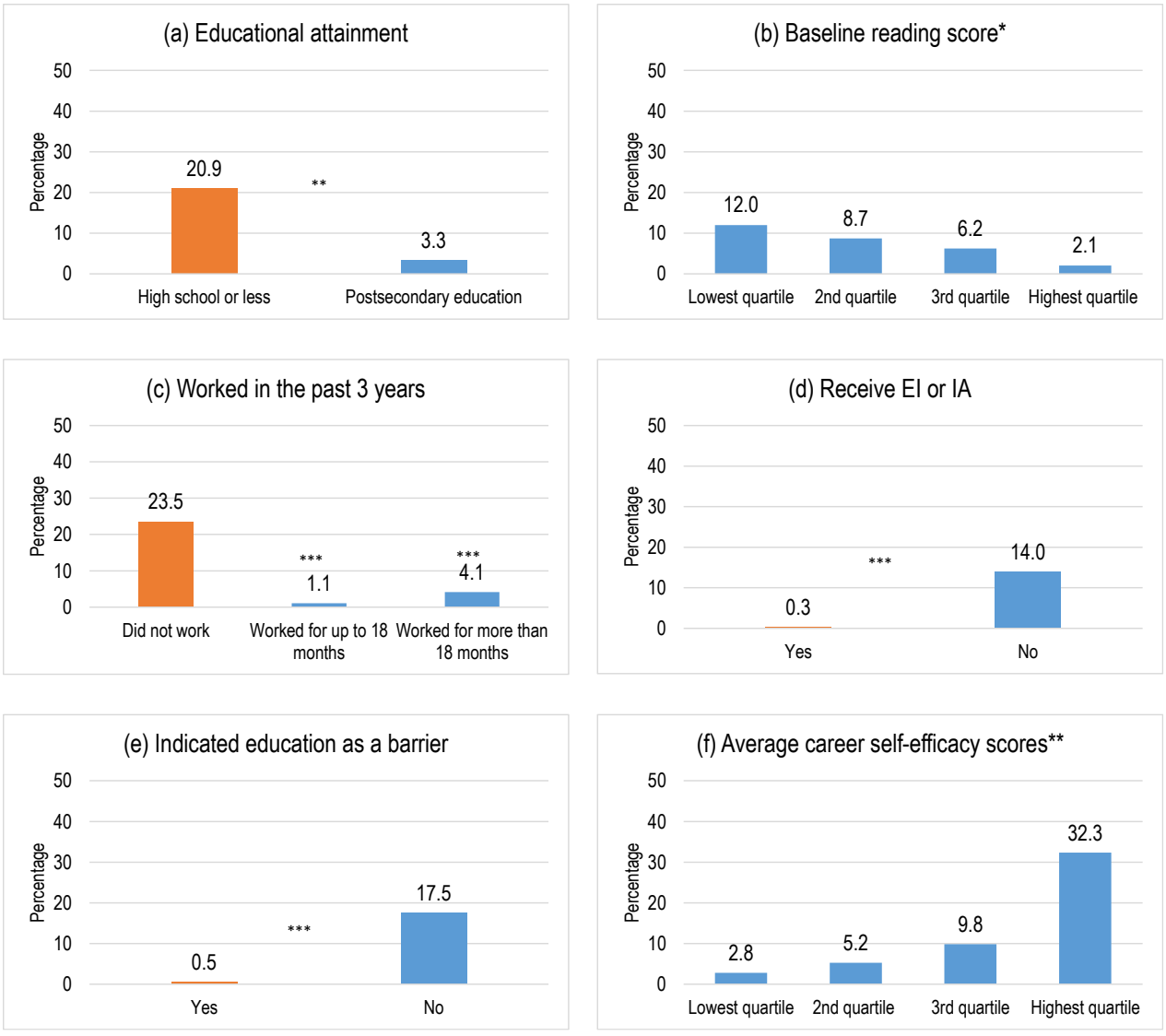


The multivariate analysis revealed that several characteristics were associated with failure to complete Portfolio, namely:

- Those lower levels of education (high school or less) were about 18 percentage points more likely to drop out of Portfolio before finishing than otherwise similar persons with a post-secondary degree (Figure 14a).
- Failure to complete Portfolio becomes more likely as reading score decreases, with those in the bottom quartile of reading scores about 10 percentage points more likely to leave the program than otherwise similar persons in the top reading quartile (Figure 14b).
- Participants who had not worked in the past three years were much more likely to fail to complete Portfolio than similar persons who had worked (Figure 14c).
- Recipients of Employment Insurance and/or Income Assistance were 14 percentage points more likely to complete Portfolio development once started, compared to similar non-recipients of benefits (Figure 14d).
- Participants who said their education was a barrier to their employment were about 17 percentage points more likely to finish Portfolio development than otherwise similar persons who did not report an education barrier (Figure 14e).
- Finally, those with high levels of career-related self-efficacy[3] were much less likely to finish their Portfolio development than otherwise similar persons with lower self-efficacy (Figure 14f).

[3] Career-related self-efficacy scores were calculated by averaging career decision-making self-efficacy and job search self-efficacy.

Figure 14 Failure to complete Portfolio (%), by characteristic



Sources: Baseline survey and project management information system.

Notes: 1) For indicators measured on a continuous scale (b. and f.), the stars in the titles of the graph denote a statistically significant relationship between these scores and failure to complete Portfolio.

2) For categorical indicators (a., c., d., and e.), statistically significant differences between the reference category (orange bar) and other categories (blue bars) are indicated.

3) In either case, * denotes that the trend is statistically significant at the 10% level, ** at 5%, and *** at 1%.

Program implications

Results from the multivariate analysis on take up and completion of the Portfolio phase, along with feedback collected from interviews with project staff, suggest a number of implications with respect to program suitability and targeting as well as participant support and engagement.

- Participants facing immediate and ongoing life challenges may find it difficult to transition into and engage in an intensive program such as Portfolio development (6 hours per day, 5 days per week, for 2 weeks) without additional supports. Besides child care, program staff emphasized the importance of food and transportation supports for this population.
- Participant engagement can be further supported by focusing on building lines of referral from employment centres. Referred clients feel more accountable since they report back to their case workers, and rely on case workers for referrals to future services and programs. In addition, program staff may use case workers as an additional channel through which to engage with participants. In this project, connecting with case workers was difficult especially for Douglas College, since the project coincided with the beginning of a system-wide reform of employment services in British Columbia.
- Higher-need clients – for example, those with lower levels of education, low literacy skills, and little work experience – were more likely than others to leave the program early, even though it was designed to benefit them the most. Program staff indicated that the materials used in the course were not too advanced and were thus unlikely to be a reason for lower engagement among these groups. Instead, they cited the small, mixed groups stemming from various recruitment challenges outlined earlier, and the difficulty lower-skilled persons may have had in engaging in such groups. Lower-skilled members of a small group may quickly perceive that they don't "measure up" to classmates, and thus find it difficult to articulate their skills in a group context. More reliable channels of recruitment and referral would allow for larger groups and facilitate development of peer support networks, thus enhancing motivation to stay engaged with the program.
- Portfolio development may be especially suitable for those with relatively high skills who are closer to the labour market, but report an education barrier that prevents them from getting a job. These kinds of individuals are more engaged and more likely than others to complete their Portfolio, possibly because they see Portfolio as a chance to focus on identifying and making plans for future education and training needed for their target occupation.
- In some cases participants may be "overqualified" for Portfolio development. For example, if they already have high levels of self-efficacy in their career decision-making and job search strategies at baseline, they may perceive that the program is too basic and disengage. Identifying these individuals at the beginning of the program and offering them a more customized Portfolio and accelerated path to Skills Enhancement may be keys to maintaining their level of engagement.

Skills Enhancement

What was delivered?

Interviews with project staff were conducted to gain further understanding of how the Skills Enhancement portion of the program was delivered, and whether delivery was consistent with the intended program model.

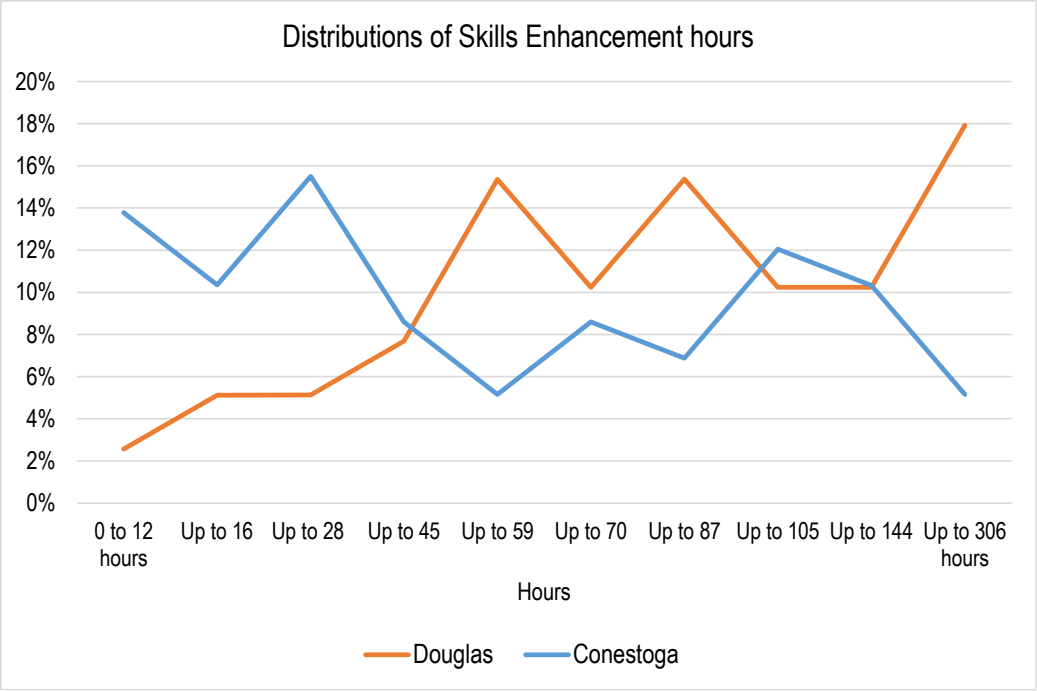
Unlike Portfolio development, Skills Enhancement was more individualized and occupation focused, contextualizing each person's skill building activities within the specific requirements of their targeted occupation. Thus, while each site implemented the core elements of Skills Enhancement, there was no national curriculum. Instead Skills Enhancement staff researched and developed their own materials at each site. Also staff at all three sites met regularly to share ideas and resources for skills enhancement, and often used learning materials from a common source (e.g., Eskilon).

Generally staff felt that they were able to find sufficient resources for learning activities. One challenge for staff at multiple sites was maintaining a sufficient emphasis on document use, reading and numeracy; often participants wanted to focus more on other essential skills and staff had to find creative ways of integrating document use, reading and numeracy.

The original budget allowed for 50 per cent of the targeted number of Portfolio participants going on to Skills Enhancement. Lower than planned recruitment numbers as well as attrition at the Portfolio stage meant that sites were able to recommend anyone they thought could benefit into Skills Enhancement. Thus recommendations were based on a comparison between assessed Essential Skill levels and skill requirements for targeted occupations taken from the National Occupational Classification. Since most participants fell short of their skill requirements and there was no 50 per cent ceiling, recommendation rates into Skills Enhancement ended up being close to 85 per cent.

Those who were recommended and started Skills Enhancement spent an average of 71 hours on various skill building activities. There was, however, a wide variability in hours between individuals and colleges. As illustrated in Figure 15, the number of hours in Skills Enhancement ranged from less than 12 to about 300. Douglas College participants spent a significantly higher number of hours – most were at 60 or more hours – in Skills Enhancement than those at Conestoga College, most of whom spent fewer than 60 hours.

Figure 15 Distribution of Skills Enhancement hours



Source: Project management information system.

As intended, skills enhancement was a combination of group and self-directed learning activities. Participants spent an average of 16.2 hours in group activities, 28.9 hours in hours at home, and 25.6 hours in lab activities. In terms of the top 3 skills on which participants focused, reading and document use were selected by over half of participants, while numeracy was selected by about 40 per cent – though there were wide variations by college (Table 2). Digital technology was next at 34 per cent, while 29.7 per cent of participants focused on oral communication.

Table 2 Objectives (sum of top 3) – Week 1 of Skills Enhancement, proportion of participants by skill (%)

	Douglas College (N=43)	Conestoga College (N=61)	CNA (N=7)	Total (N=111)
Reading	51.2	54.1	85.7	54.9
Document use	62.8	52.5	57.1	56.7
Numeracy	16.3	54.1	57.2	39.6
Oral communication	32.6	29.6	14.3	29.7
Working with others	0.0	16.4	0.0	9.0
Thinking	0.0	18.0	0.0	9.9
Digital technology	41.9	29.6	28.6	34.2

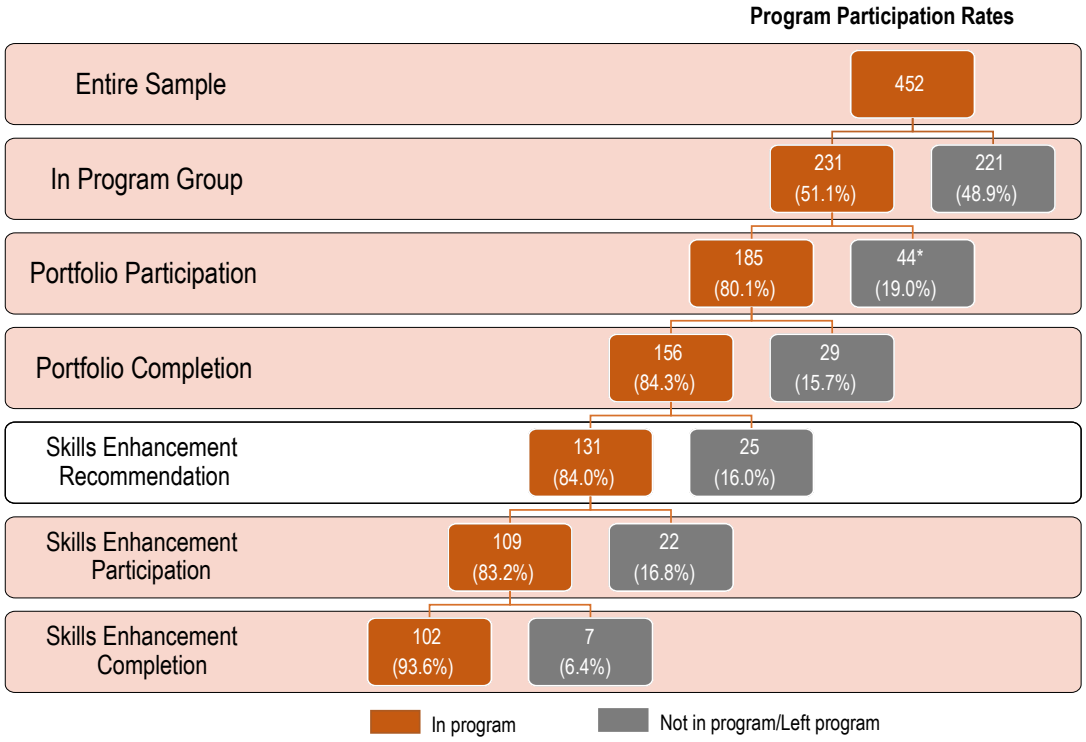
Source: Project management information system.

The next two sections discuss the participant characteristics associated with 1) failure to receive a recommendation for Skills Enhancement training after completing Portfolio development, and 2) failure to start Skills Enhancement training after being recommended.

Who was recommended for Skills Enhancement?

As illustrated in Figure 16, of the 156 participants who completed portfolio, 131 or 84 per cent were recommended for Skills Enhancement while 25 or 16 per cent were not.

Figure 16 Skills Enhancement recommendation



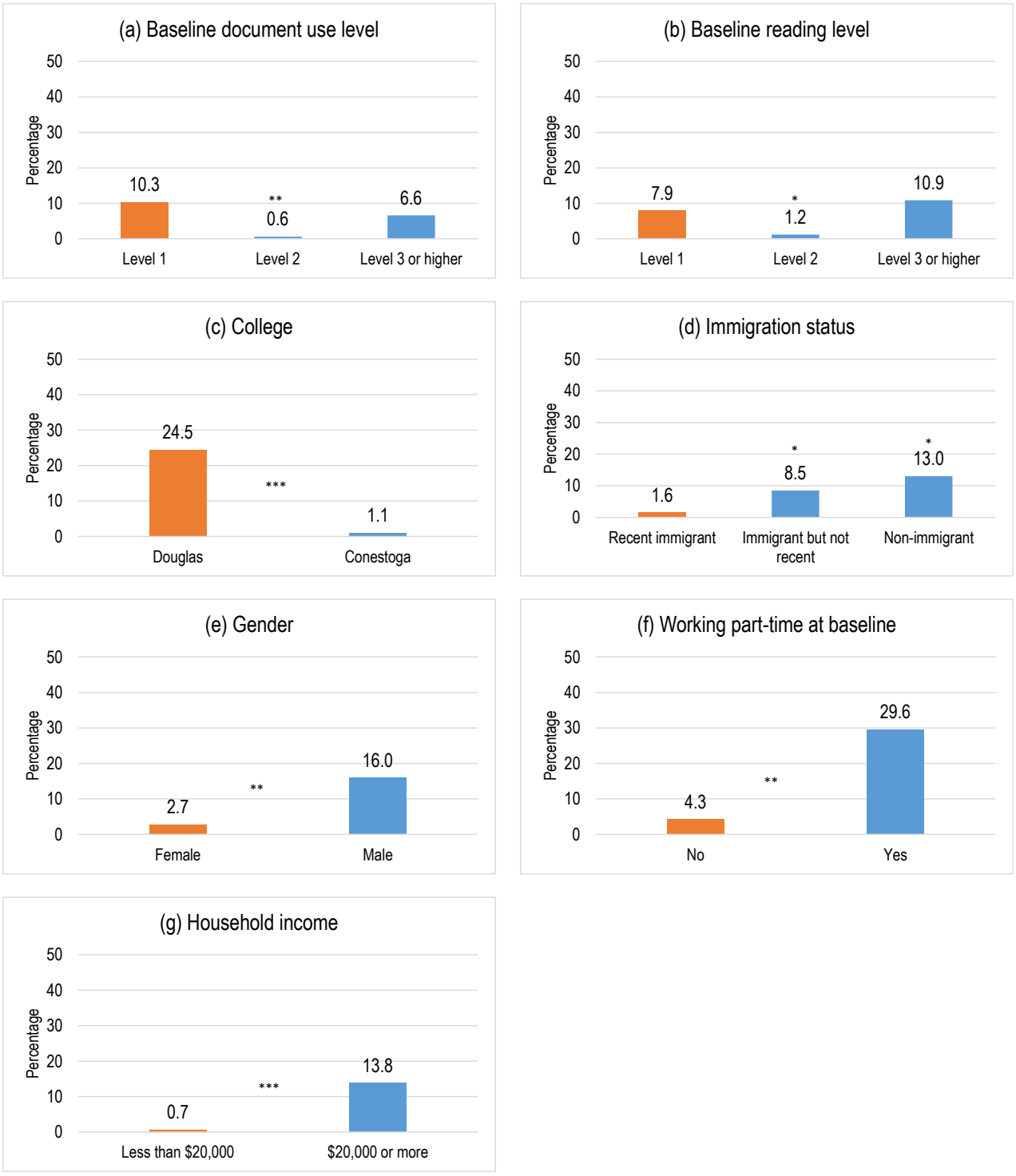
Differences in the likelihood of being recommended for skills enhancement were assessed using multivariate regression and the same range of indicators as described above for the portfolio attrition analysis – i.e., college, demographic characteristics, distance from labour market indicators, employment barriers, and baseline levels of Essential Skills and career adaptability.

Six indicators were observed to be significant predictors of Skills Enhancement recommendation, namely baseline document use and reading levels, college, immigration status, gender, baseline employment status and income. More specifically:

- Those with level 1 document use and reading scores were less likely than those with level 2 to be recommended for Skills Enhancement after completing Portfolio (Figures 17a and 17b).

- The likelihood of being recommended varied by college; Portfolio completers at Douglas College were 23 percentage points less likely to be recommended for Skills Enhancement than those with otherwise similar characteristics at Conestoga College (Figure 17c).
- Non-immigrants and established immigrants were significantly less likely than recent immigrants with otherwise similar characteristics to be recommended for Skills Enhancement (Figure 17d).
- Male Portfolio completers were 13 percentage points less likely to be recommended for Skills Enhancement than women with otherwise similar characteristics (Figure 17e).
- Part-time employees (the minority of participants who were working but less than 20 hours per week at baseline) were 25 percentage points less likely to be recommended than those with otherwise similar characteristics who were not working (Figure 17f).
- Those with household incomes of $20,000 or higher were 13 percentage points less likely to be recommended than those with otherwise similar characteristics but household incomes less than $20,000 (Figure 17g).

Figure 17 Failure to be recommended, by characteristic



Sources: Baseline survey and project management information system.

Note: Statistically significant differences between the reference category (orange bar) and other categories (blue bars) are indicated.by the following: * denotes that the trend is statistically significant at the 10% level, ** at 5%, and *** at 1%.

Program implications

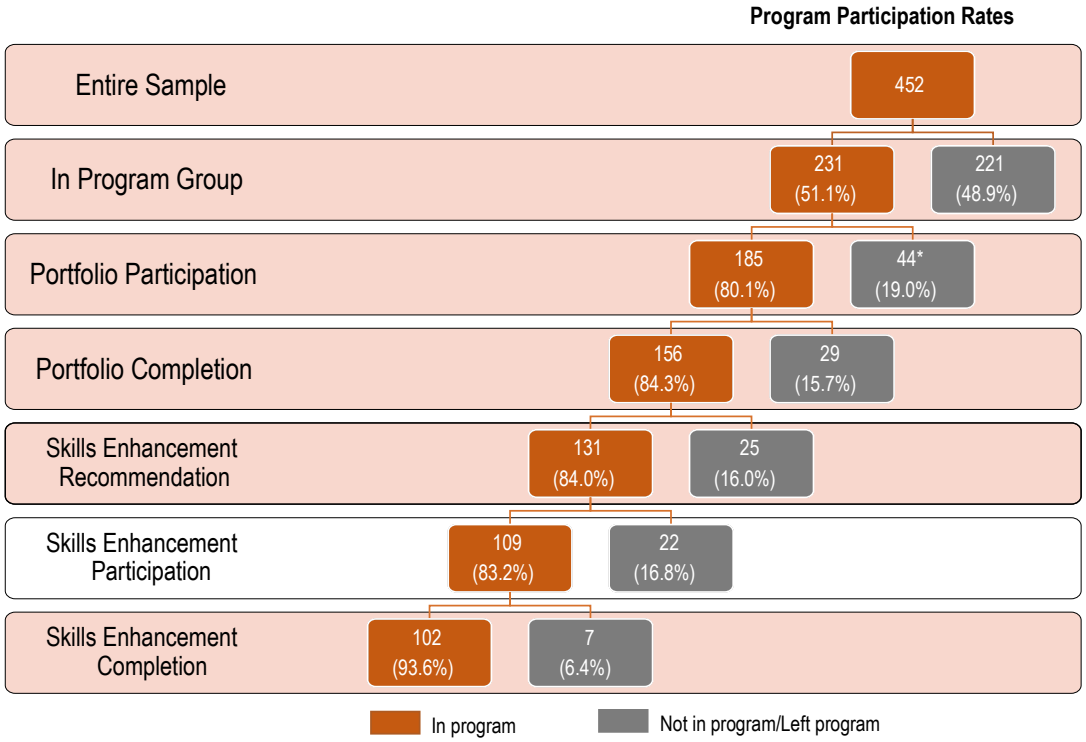
Results from the multivariate analysis on recommendations to Skills Enhancement, along with feedback collected from interviews with project staff, suggest a number of implications with respect to consistency in targeting, as well as learners targeted by the program who may need more support and engagement.

- Some learners are selected into Skills Enhancement by design – for example, Skills Enhancement was designed for those who had a gap between their current skill level and the skill level required for their target occupation. Thus, the observed tendency to recommend level 2 learners at higher rates than level 3 learners reflects the greater likelihood of gaps between current and required skill levels in the former group.
- However, level 1 learners are relatively unlikely to be recommended into Skills Enhancement despite their even greater need. This result came as a surprise to program staff, and was likely a product of participant choice rather than program design. In other words, some level 1 learners may have simply left the program after Portfolio but before they had a chance to be recommended for Skills Enhancement. After completing 60 hours of Portfolio development, some may find it difficult to engage in additional hours/weeks of learning without additional motivational or other supports.
- Learners at Douglas College were less likely to be recommended than learners with identical skill gaps Conestoga College. As was the case for entry into Portfolio, this may partly stem from the greater presence of third party sources of referral (i.e., career centre coaches) at Conestoga, which meant greater accountability for participants as well as providing program staff with another way to stay in touch and engage with participants. In addition, the protocols around recommendation may have differed between colleges. Douglas College staff indicated that they would be very likely to recommend someone below level 3 but unlikely to recommend someone at level 3 or above. However, Conestoga and CNA staff placed less emphasis on current skill level in making the recommendation decision.

Failure to start Skills Enhancement

As highlighted in Figure 18, of the 131 learners recommended, 22 or 16.8 per cent failed to start Skills Enhancement. Among those who started Skills Enhancement the completion rate was very high at 93.6 per cent. However, there was no standard definition for “completion”, as the number of hours it took to complete Skills Enhancement varied widely.

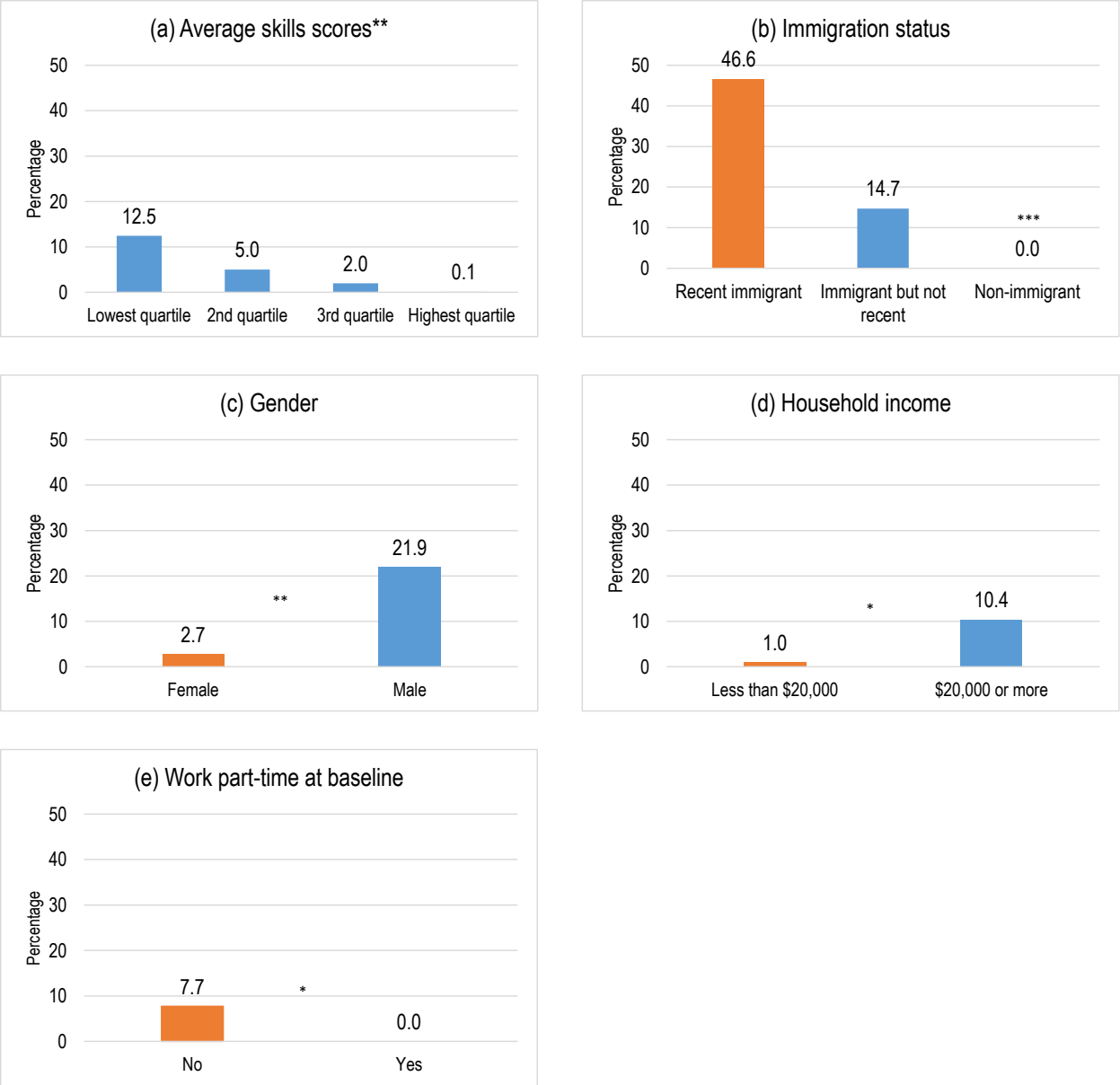
Figure 18 Skills Enhancement participation



The multivariate analysis revealed that several characteristics were associated with failure to start Skills Enhancement, namely:

- There was a direct relationship between average skill score (i.e., the combined average of document use, reading, and numeracy scores) and likelihood of starting Skills Enhancement. Those with lower scores were less likely to start than those with otherwise similar characteristics but higher scores (Figure 19a).
- Recent immigrants were less likely than non-immigrants with otherwise similar characteristics to start Skills Enhancement after being recommended (Figure 19b).
- Men were 19 percentage points less likely to start Skills Enhancement after being recommended than women with otherwise similar characteristics (Figure 19c).
- Those with household incomes of $19,000 or higher were less likely to start Skills Enhancement than otherwise similar persons from lower income households (Figure 19d).
- Those who were unemployed at baseline were less likely to start Skills Enhancement than part-time workers with otherwise similar characteristics (Figure 19e).

Figure 19 Failure to start Skills Enhancement, by characteristic



Sources: Baseline survey and project management information system.

Notes: 1) For indicators measured on a continuous scale (a.), the stars in the titles of the graph denote a statistically significant relationship between scores and failure to start Skills Enhancement.

2) For categorical indicators (b., c., d., and e.), statistically significant differences between the reference category (orange bar) and other categories (blue bars) are indicated.

3) In either case, * denotes that the trend is statistically significant at the 10% level, ** at 5%, and *** at 1%.

Program implications

Results from the multivariate analysis on failure to start Skills Enhancement, along with feedback collected from interviews with project staff, suggest a number of implications with respect to keeping learners engaged and considering factors such as motivation, confidence, and willingness to invest in further learning.

- Those with lower literacy skills (level 1) were both less likely to be recommended to Skills Enhancement and less likely to enter the program if recommended. As noted earlier, the program model called for level 1 learners to be recommended for Skills Enhancement, so failure to be recommended and failure to start if recommended both likely stem from learner choice.
- Learner choice was also likely behind other groups being less likely to be recommended and/or start the program. Some groups may be less likely to perceive the need or value of investing in further learning. For example, male learners and those in higher income households were both less likely to be recommended and less likely to start after being recommended than women and low income learners with similar skill levels. These kinds of choices likely stem from differences between groups in motivation and engagement with their learning. Motivational differences may stem from a variety of factors, including impatience, confidence, ongoing work or household commitments, or levels of financial need/hardship.
- In some cases, groups that were ***most likely to be recommended*** for Skills Enhancement were ***least likely to actually start the program***. For example, recent immigrants were more likely to be recommended than established immigrants or non-immigrants, but less likely to enter the program after recommendation. Similarly, the unemployed were more likely to be recommended than those who had part-time jobs, but less likely to enter the program after recommendation. Inconsistencies between being recommended and actually entering the program suggest that in some cases learning engagement may flag with time, and that a time lag between recommendation and program entry may result in potential drop-off among less confident or less engaged learners.
- Staff indicated that several factors – principally motivation and self-confidence – entered into a participant's choice to pursue Skills Enhancement or not. As one instructor noted, "…that digging deep and looking at yourself in a really honest way, that's not easy for everybody to do." In some cases, those who are less engaged and less confident may be the ones who would benefit the most from the program if they were only able to clear the participation hurdle. Attempts to stay in touch and motivate participants to engage with up to three phone calls were not enough for some learners to stay with the program.
- The current delivery model of the FWSP – focused on referrals from Work BC employment centres, largely lower-skilled Canadian born income assistance recipients – has eliminated the two-phase design used in this research project, and instead integrated delivery of Portfolio and Skills Enhancement. This not only eliminates the time lag between distinct program phases during which learner motivation and confidence may lag, but also focuses on engaging learners who are accountable to their case workers.

Contact with control group members

The intended research design for this project was that after random assignment the only contact staff would make with control group participants would be to arrange completion of the 12-week follow-up survey and assessment. Staff at all sites indicated that they adhered to this protocol. Though the control group continued to be eligible for other employment and career development services, staff at Douglas College and College of the North Atlantic indicated that there were no programs in the area offering anything similar to the FWSP model. Staff at Conestoga College, however, indicated that although there was no other program with the same format as the FWSP, the career centre from which the college received referrals for the FWSP offered workshops that covered some of the same topics. So it is possible that control group participants at Conestoga College received training that overlapped to some extent especially with the Portfolio development portion of the FWSP.

Participant feedback on the training

As part of the 12-week follow-up survey, program group members were asked to give feedback on various aspects of the training they received. As illustrated in Table 3, participants who responded were generally very satisfied with the program – responses to all items were strongly positive. Of particular note, when participants were asked to respond to the statement "I would recommend the program to others", 90 per cent agreed or strongly agreed while only 3 per cent disagreed (the remaining 7 per cent answered neutral).

Table 3 Participant feedback on the FWSP (Program Group) (%)

	Douglas College (N=55)	Conestoga College (N=69)	CNA (N=9)
Objectives clearly explained	94.5	98.6	77.8
Program achieved its objectives	83.6	92.8	77.8
Program did **not** really help me with my specific career goals	10.9	10.1	0.0
The program helped me understand…			
…and communicate my skills	92.7	91.3	55.6
…what occupations were the best fit for my skills	70.9	72.5	66.7
…which of my skills needed to improve in order to find work in my chosen occupation	87.3	82.6	100.0
The program did **not** really help me improve my skills	9.1	5.8	25.0
I found this program to be useful	92.7	91.3	75.0
Topics covered were relevant to my career goals	70.9	84.1	44.4
I will be able to use what I learned in the program to help me find the job I want	83.6	87.0	88.9
I would recommend the program to others	92.7	92.8	66.7

Source: Twelve-week follow-up survey.

Note: Percentages indicate those who agreed or strongly agreed with each statement.

Twelve-week impacts

As described earlier in the report, control and program group members completed surveys and assessments at baseline (before random assignment), and then again at 12 weeks after random assignment (by which point all program group members had either finished or left the FWSP). **Program impacts** are evaluated by comparing gains made by the program group with those made by the control group over the 12-week period. Because random assignment ensures that the two groups were not systematically different prior to the FWSP, any impacts that emerge can be attributed to the program.

Twelve-week impacts were examined for two kinds of indicators targeted directly by the FWSP program model, namely:

- **Career adaptability** measures related to participant clarity and confidence with regard to career planning and job search.
- **Essential Skill assessment scores** in the core literacy areas of document use, reading, and numeracy.

Career adaptability in this context refers to a person's capacity to cope and shape their future career track in the face of economic stressors such as job loss or insecurity, unemployment or underemployment. A frequent response to such economic stressors is anxiety and other negative emotions, leading to short-term thinking and intense unfocused job search for the first available "survival" job, which may in turn lead to further insecurity, underemployment, etc. thus perpetuating the negative career spiral. Career adaptability, on the other hand, emphasizes positive, proactive thoughts and behaviours which allow people to change their existing frames of reference and routines, leading to potential new opportunities and higher quality (re)employment.

For this study, we adapted a set of standardized career adaptability measures based on research literature showing conceptual and empirical links between these measures and subsequent job quality.[4] Survey items comprising each of the four career adaptability measures we used – career planning, career decision-making self-efficacy, job search clarity, and job search self-efficacy – are shown in Appendix E.

Previous impact analysis (presented to the project partners earlier, and summarized below) showed that at 12 weeks, the FWSP produced positive impacts on all four dimensions of career adaptability, i.e., career planning, career decision-making self-efficacy, job search clarity, and job search self-efficacy. Positive program impacts were also found on Essential Skills, especially numeracy. However, impacts on document use and reading were weaker. These results represent the average impacts of the program on the entire sample, including those who never made it beyond Portfolio development (roughly 28 per cent of the follow-up sample) as well as those who participated in both Portfolio and Skills Enhancement.

[4] See for example Zikic and Klehe (2006), Koen, Klehe, Zikic, and Van Vianen (2010), and Klehe, Zikic, van Vianen, Koen, and Buyken (2012).

Because Skills Enhancement may produce impacts incremental to those produced by exposure to Portfolio Development (especially in the area of Essential Skills gains), we divide the program group into two sub-populations: Portfolio only and Portfolio + Skills Enhancement. In theory, conducting separate impact analyses on these two groups would allow us to assess on which of them the program has had the largest impact. However, because entry into Skills Enhancement is not random, splitting the program group according to whether or not they participated in Skills Enhancement negates the advantages of the original random assignment design by producing two program sub-groups that are both systematically different from the control group.

To minimize the bias introduced by splitting the sample based on exposure to different elements of the program, we use a technique known as propensity score matching to compare the outcomes of each program sub-population with those of a comparison group drawn from the control group and matched on a wide range of baseline characteristics. This allows us to estimate quasi-experimental impacts for each sub-group.

The details of the matching procedure are summarized below, followed by the results. The major research question addressed here is whether exposure to Skills Enhancement in particular leads to higher impacts at 12 weeks than those observed for program group as a whole.

Propensity score matching

The logic behind propensity score matching is straightforward. For the program group, the decision regarding which participants received only Portfolio development and which received both Portfolio development and Skills Enhancement was non-random in two ways:

1. Participants with certain characteristics (e.g., low skills) were recommended by design to the Skills Enhancement group by program staff, while other participants with different characteristics were not recommended.
2. As discussed in the analysis of program delivery, high attrition rates at early stages of the program meant that some members of the program group that staff might have recommended for Skills Enhancement left the program of their own accord before they could receive such a recommendation.

The result of such selection by design and self-selection was a group of Skills Enhancement participants that differed from the rest of the program group not only in their exposure to Skills Enhancement but also in other observable and unobservable characteristics that may have affected their skills gains and other outcomes. As a result, any direct comparison between those exposed to Skills Enhancement and the control group is likely to be biased.

To minimize the biases that such selection may generate, we use a matching method to find for each member of a particular program sub-group (e.g., Skills Enhancement participants) a control group participant (or group of participants) who is *similar* to the program group member, and compare how their career adaptability and skills scores changed between baseline and follow-up. Averaging across all participants, the matching method provides a ***quasi-experimental estimate of the program impact*** for any sub-group of program participants.

Thus if the program group is divided into two components – Portfolio development and Skills Enhancement – theoretically, a matching method can be applied to analyze the average impact of Portfolio development and the average impact of Skills Enhancement *separately*. Those who only completed Portfolio without going into Skills Enhancement could be compared with matched control group members, while an analogous but separate comparison can also be made between those who were exposed to Skills Enhancement and matched control group members.

However, due to the low response rate at follow-up survey of participants who left the program at the Portfolio stage, the resulting small sample size (N=30) means that we do not have enough statistical power to allow for the matching procedure to be applied to this sub-group. However, comparing the impacts on those who participated in both Portfolio and Skills Enhancement with the average impacts on the population as a whole will allow us to investigate not only the incremental impacts of the Skills Enhancement portion of the program, but also to infer the program impacts on those who participated in Portfolio only.

In order to produce reliable, bias-free impact estimates, the matching process relies upon careful identification of what makes a Skills Enhancement participant and a control group member *similar*. The matching criterion used in this analysis is the ***propensity for program group members to go on to Skills Enhancement***. More specifically, using an array of baseline characteristics, a propensity score – ranging from zero to one and indicating the probability of starting Skills Enhancement – was estimated for each program group member who completed the follow-up survey and assessment. Higher propensity scores indicate those whose characteristics make them more likely to enter Skills Enhancement. Because propensity score is estimated in such a way that those with similar propensity scores are also similar in terms of baseline characteristics, observable individual differences that may give rise to selection bias are minimized using this technique.

To establish a matched comparison group, the propensity score estimation was also applied to control group members who completed a follow-up survey and assessment. The details of the propensity score estimation are presented in Appendix F. Control group members and Skills Enhancement participants with matched propensity scores share not only the propensity to start Skills Enhancement training but also the individual characteristics that are related to their participation decisions and their skills gains at follow-up.

Essentially, the matching procedure identifies control group members whose propensity scores indicate the probability they would have participated in Skills Enhancement had they been offered the program. In addition, their propensity scores indicate that had they participated in Skills Enhancement, their gains in career adaptability and essential skills would have been similar in magnitude to those of actual Skills Enhancement participants with matched propensity scores. Therefore, after the matching procedure is applied, any observed differences between the outcomes of control group members and those who actually went through Skills Enhancement training can be attributed to the training itself.

The details of the matching algorithm we used to make inferences about program impact are presented in Appendix G. The next section presents the quasi-experimental impacts of Skills Enhancement on career adaptability indicators and Essential Skills after propensity score matching is applied.

Results: Career adaptability

Figure 20 illustrates the results for the four dimensions of career adaptability, namely career planning, career decision-making self-efficacy, job search clarity, and job search self-efficacy.

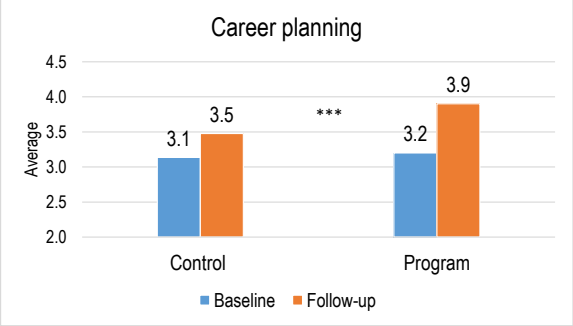
The left column of each graph shows the average impacts for the program group as a whole, by comparing baseline-to-follow-up gains among the program group with those of the control group.

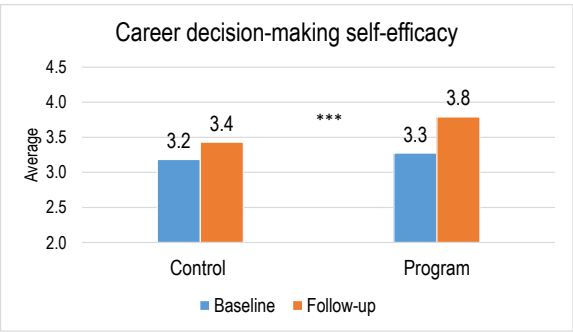
The right column shows impacts for Skills Enhancement participants, by comparing their baseline-to-follow-up gains with those of a propensity score matched group of control participants. The baseline scores of the two groups are identical, because baseline levels of career adaptability and essential skills were included as matching criteria in the propensity score models. This means that Skills Enhancement impacts are indicated simply by the difference between Skills Enhancement participants and the matched control group at follow-up.

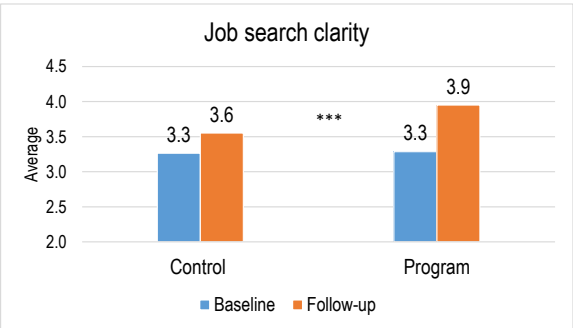
Our original impact analysis showed strong and significant impacts for the program group as a whole on the full range of career adaptability measures (Figure 20; left column). The magnitude and statistical significance of these impacts remains largely the same when comparing Skills Enhancement participants and matched control group members (Figure 20; right column), indicating that impacts on career adaptability were large for those program group members who experienced only Portfolio development, as well as for those who also participated in Skills Enhancement. This result is consistent with the idea that most of the impact on career adaptability took place while participants were developing their Essential Skill portfolios in relation to the skill requirements of targeted occupations, during the Portfolio phase of the FWSP.

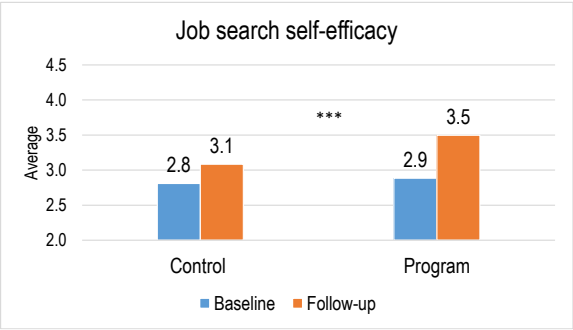
Figure 20 Career adaptability

Average impacts for the program group as a whole

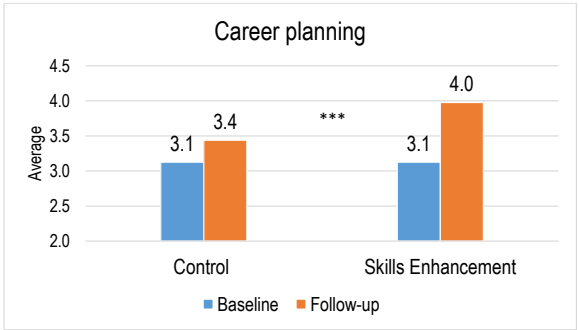


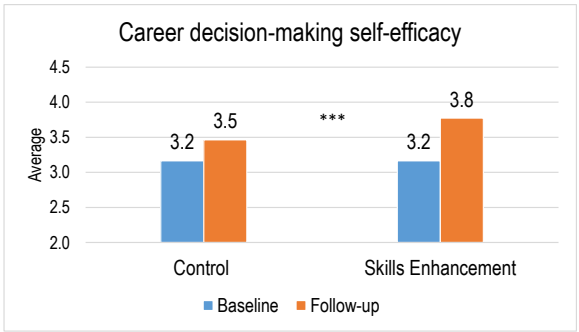


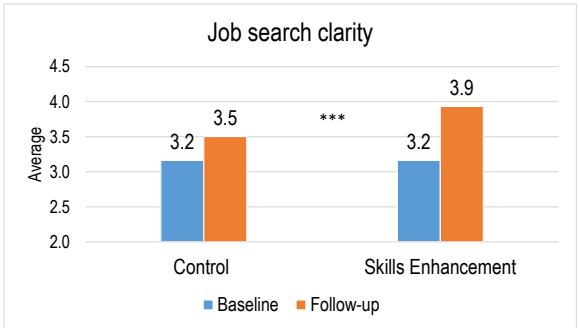


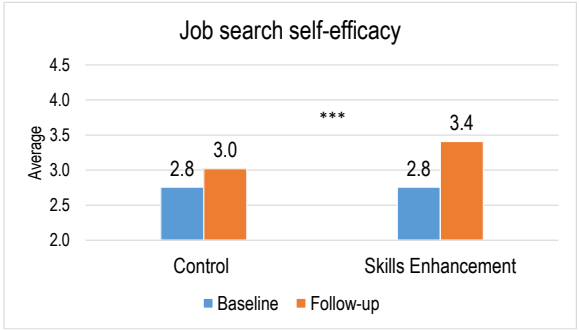


Impacts of Skills Enhancement









Note: Statistically significant differences in baseline-to-follow-up gains are indicated as follows: * denotes that the difference is significant at 10% level ($p<0.1$), ** at 5% ($p<0.05$), and *** at 1% ($p<0.01$).

Results: Essential skills

Because Portfolio development was designed to identify gaps in Essential Skills, while Skills Enhancement activities were designed to help participants build their Essential Skills to close identified gaps, we expect impacts on Essential Skills scores to be driven by participation in Skills Enhancement.

Numeracy

Figure 21 illustrates the results for numeracy skills.

Comparing the left and right columns of each graph shows that though average impacts on the program group as a whole were significant, ***impacts on Skills Enhancement participants were larger***.

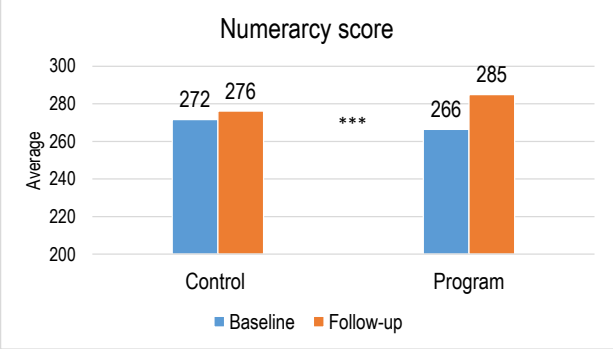
For example, the program group as a whole showed a 19-point average gain in numeracy score compared to a 4-point gain in the control group, for an overall impact of 15 points. However, Skills Enhancement participants in particular had an average 20-point gain compared to a *loss* of 2 points among matched control group members, indicating that the impact of Skills Enhancement was 22 points.

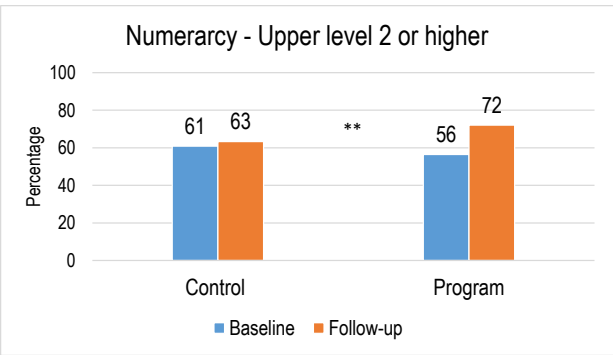
Similarly, the impact on the proportion at upper level 2 was significant for both the program group as a whole and Skills Enhancement participants, but slightly higher for the latter. In addition, the impact on time taken to complete the numeracy assessment (which we use a proxy for willingness to engage with the assessment and persist through difficult questions) was considerably higher for Skills Enhancement participants than for the program group as a whole – the impacts were 12 minutes and 7 minutes, respectively.

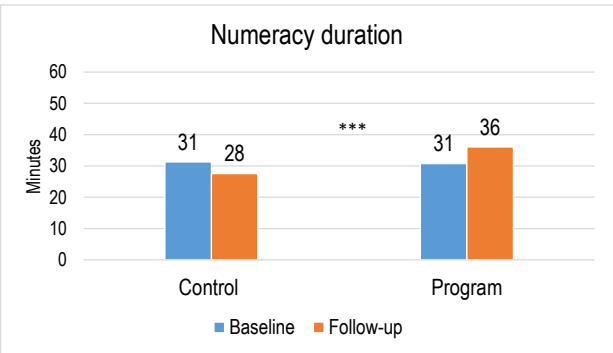
From this result, we can infer that numeracy impacts were to a large extent driven by participation in Skills Enhancement activities.

Figure 21 Numeracy

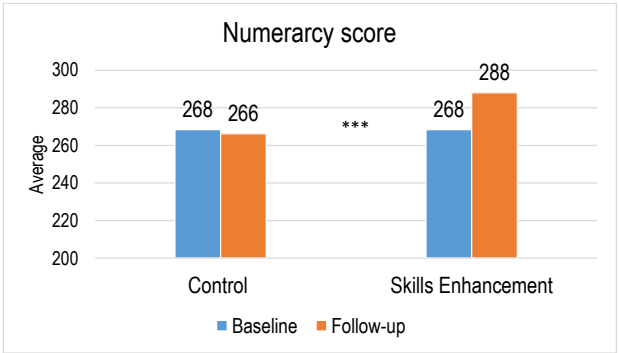
Average impacts for the program group as a whole

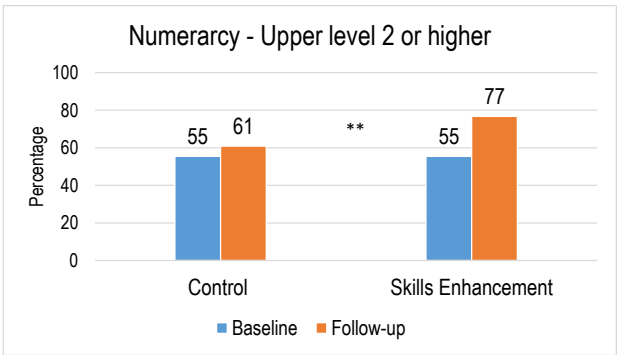


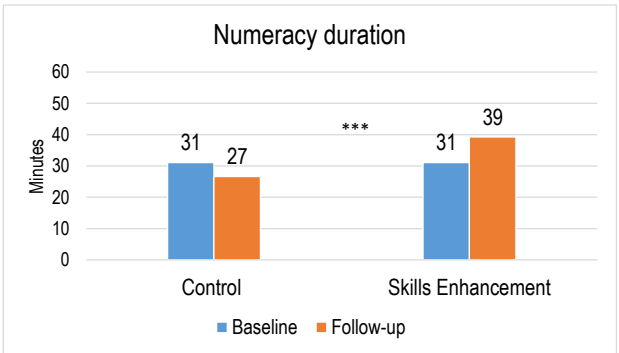




Impacts of Skills Enhancement







Note: Statistically significant differences in baseline-to-follow-up gains are indicated as follows: * denotes that the difference is significant at 10% level ($p<0.1$), ** at 5% ($p<0.05$), and *** at 1% ($p<0.01$).

Document use

Figure 22 illustrates the results for document use.

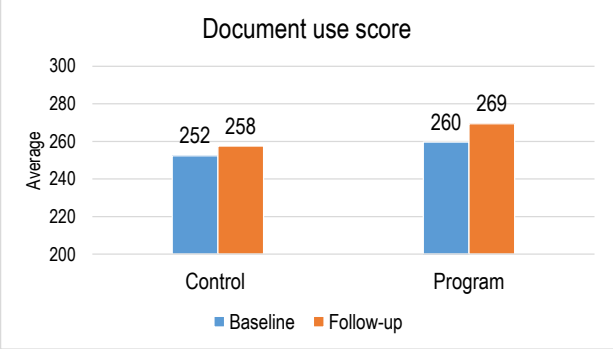
Comparing the left and right columns of each graph shows generally ***higher and more significant impacts on Skills Enhancement participants*** than on the program group as a whole.

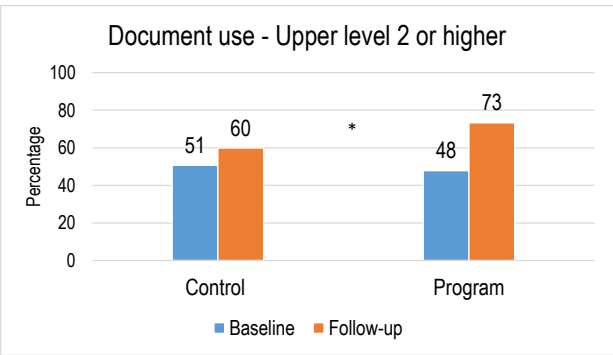
This is particularly true of impacts on document use scores, where the program group as a whole showed a 9-point average gain, not significantly higher than the 6-point gain shown by the control group – thus the impact was not significantly different from zero. However, Skills Enhancement participants had an average 18-point gain compared to a 4-point gain among matched control group members, for a significant impact of 14 points.

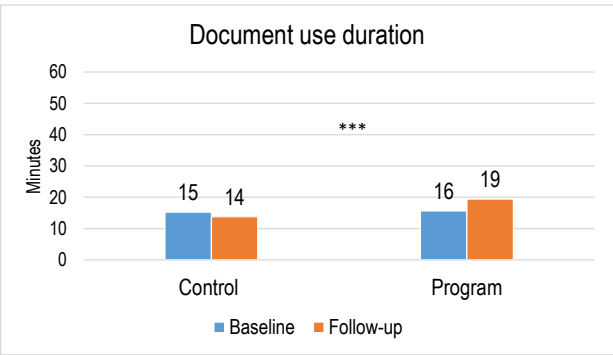
From this result, we can infer that impacts on document use scores were largely confined to Skills Enhancement participants, and that the Portfolio portion of the program by itself was not likely to produce substantial gains in document use scores.

Figure 22 Document use

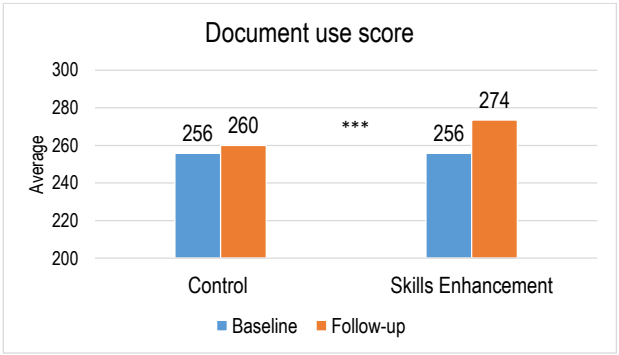
Average impacts for the program group as a whole

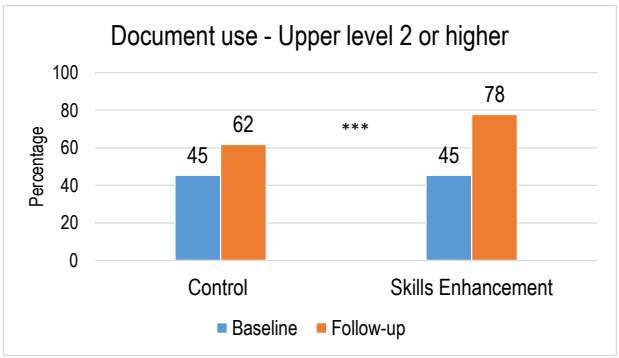


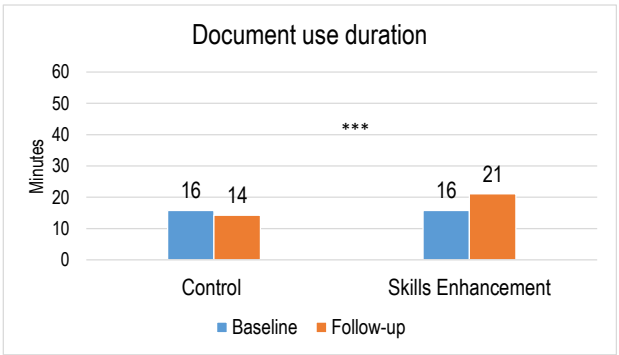




Impacts of Skills Enhancement







Note: Statistically significant differences in baseline-to-follow-up gains are indicated as follows: * denotes that the difference is significant at 10% level (p<0.1), ** at 5% (p<0.05), and *** at 1% (p<0.01).

Reading

Figure 23 illustrates the results for document use.

Comparing the left and right columns of each graph shows generally ***higher and more significant impacts on Skills Enhancement participants*** than on the program group as a whole.

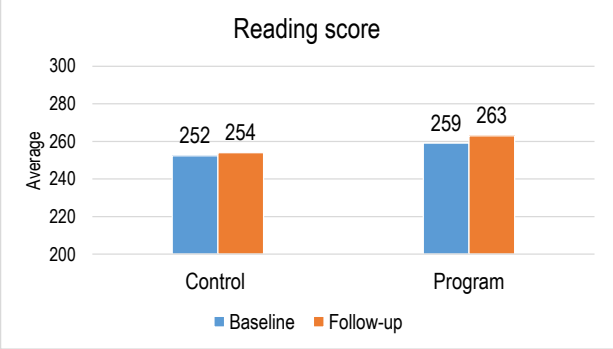
This is particularly true of impacts on reading scores, where the program group as a whole showed only a 4-point average gain, not significantly higher than the 2-point gain shown by the control group – for an impact not significantly different from zero. However, Skills Enhancement participants had an average 12-point gain compared to a 0-point gain among matched control group members, for a significant impact of 12 points.

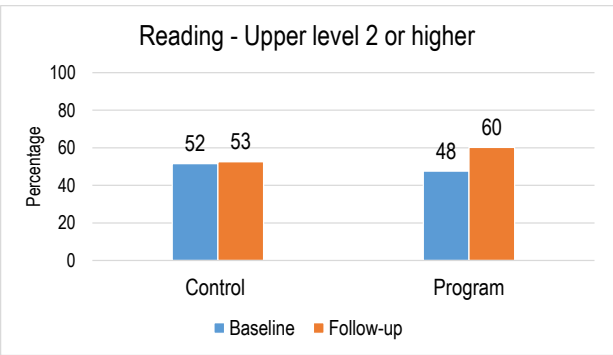
From this result, we can infer that impacts on reading scores were largely confined to Skills Enhancement participants, and that the Portfolio portion of the program by itself was not likely to produce substantial gains in reading scores.

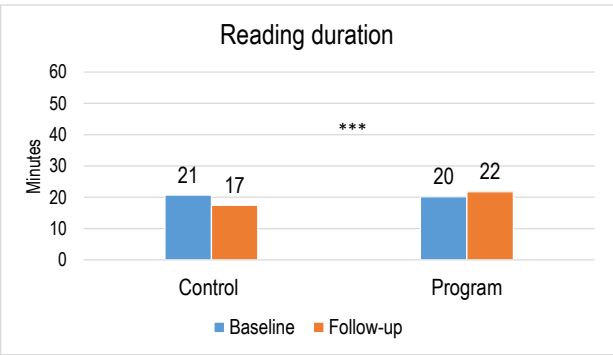
In general, as expected, gains in Essential Skills were driven by participation in Skills Enhancement, which was designed expressly to help participants improve their levels of Essential Skills and move them closer to the levels required for their target occupations.

Figure 23 Reading

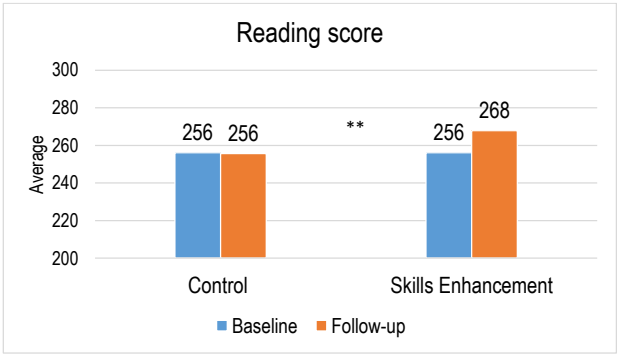
Average impacts for the program group as a whole

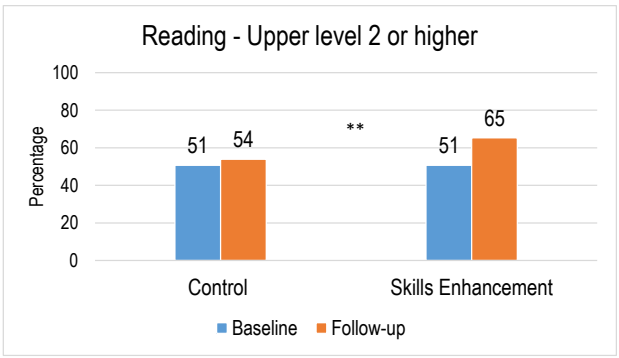


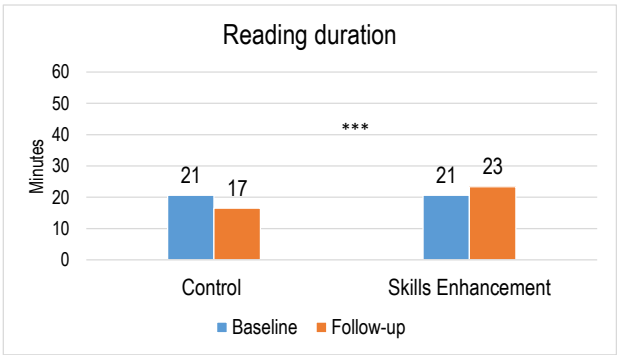




Impacts of Skills Enhancement







Note: Statistically significant differences in baseline-to-follow-up gains are indicated as follows: * denotes that the difference is significant at 10% level ($p<0.1$), ** at 5% ($p<0.05$), and *** at 1% ($p<0.01$).

Essential Skills gains, as a function of variations in Skills Enhancement hours and activities

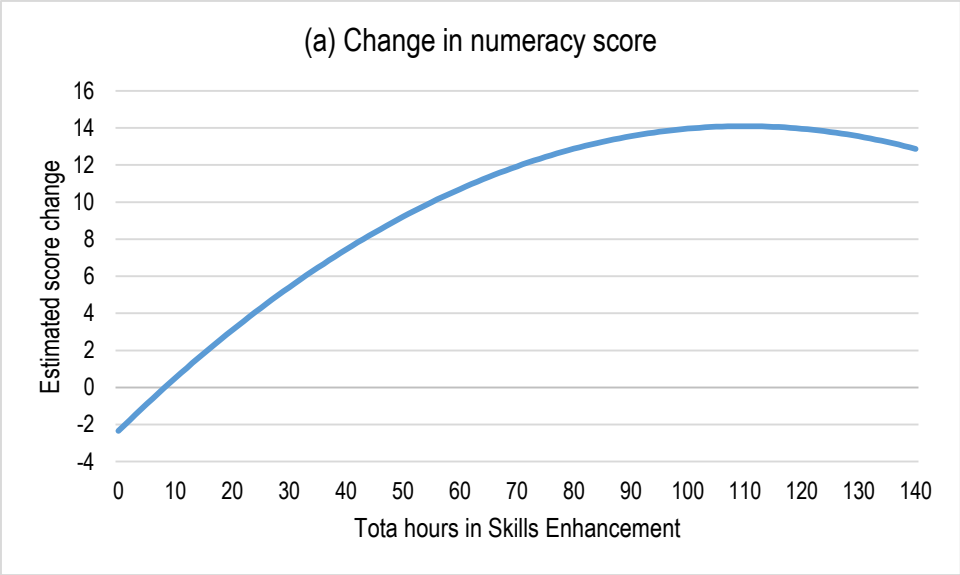
Given i) the importance of Skills Enhancement in producing impacts on all three measured Essential Skills, and ii) the large variability in hours, skill focus, and modality of learning (group vs. self-directed) among Skills Enhancement participants described earlier, we now ask to what extent gains in Essential Skills are linked with variations in the curriculum. In particular, are gains in essential skills linked with:

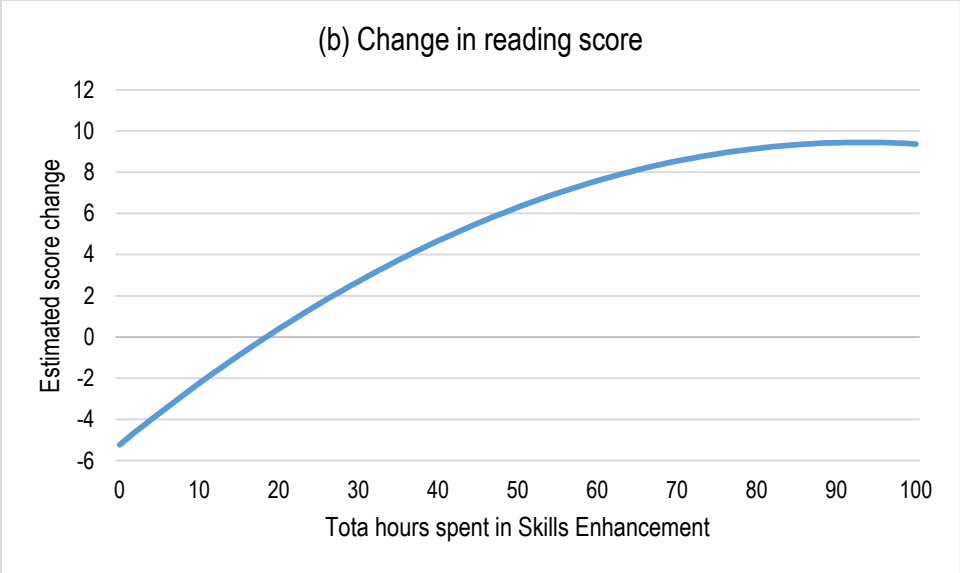
- Total hours invested in training? Did more hours lead to greater gains?
- Targeted skills? Was a focus on the "core" measured skills – document use, reading, and numeracy – associated with greater gains in these skills?
- Modality of learning (i.e., learning done in groups, in the lab, or at home)?

The multivariate analysis reveals that, after controlling for differences in demographics, distance from the labour market, starting skill scores, etc., more hours in training were associated with larger gains in two dimensions of essential skills – numeracy and reading.

Figure 24 shows that for both numeracy and reading the expected magnitude of skill gains for a demographically average person rises as the number of hours increases, but with diminishing returns. For both skills, gains start to increase at a much slower rate beyond 50 to 60 hours. The analysis also reveals that gains in numeracy skills were easier to achieve and took fewer hours than gains in reading skills.

Figure 24 By total hours in Skills Enhancement training





By targeted skills and modality of learning

With respect to other variations in the Skills Enhancement curriculum, results from the multivariate analysis suggest that the magnitude of gains did not depend on either the skills targeted or the modality of learning. Gains in the three measured Essential Skills were just as likely to occur whether or not participants explicitly identified any of the three as the target of their Skills Enhancement training. In addition, skill gains did not vary whether learning was done predominantly at home, in the lab, or in a group setting.

References

Klehe U.-C, Zikic, J., van Vianen, A. E., Koen, J., & Buyken, M. (2012). Coping proactively with economic stress: Career adaptability in the face of job insecurity, job loss, un- and underemployment. *Research in Occupational Stress and Well Being*, 10, 131-176.

Koen, J., Klehe, U.-C., Zikic, J., & vanVianen, A. E., M. (2010). Job-search strategies and reemployment quality: The impact of career adaptability. *Journal of Vocational Behavior*, 77, 126-139.

Palameta, B., Nguyen, C., Hui, T. S.-w., & Gyarmati, D. (2017). *Foundations: 12-month impacts of a literacy and essential skills intervention for job seekers*. Ottawa, ON: Social Research and Demonstration Corporation.

Zikic, J., & Klehe, U.-C. (2006). Job loss as a blessing in disguise: The role of career exploration and career planning in predicting reemployment quality. *Journal of Vocational Behavior*, 69, 391-409.

Appendix A: Participant characteristics at baseline

Table 4 Demographics, essential skills, employment, and income

	Douglas College (N=221)	Conestoga College (N=201)	College of the North Atlantic (N=30)
Demographic characteristics			
Female (%)	67.9	62.2	43.3
Age (%)			
Under 30	13.1	16.4	46.7
30 to 39	23.5	21.9	20.0
40 to 49	38.0	34.3	16.7
50 or over	22.2	26.9	16.7
Married/Common law (%)	62.0	62.2	20.0
Children in household (%)	46.6	41.8	26.7
Immigrant (%)	79.6	52.2	36.7
Recent immigrant (%)	50.2	18.9	30.0
Aboriginal (%)	4.1	2.0	6.7
High school or less (%)	18.6	21.4	60.0
Essential Skills			
Document use			
Average	238.4	264.4	192.4
Level 1 (%)	31.2	12.9	66.7
Level 2 (%)	48.9	44.8	23.3
Level 3 or above (%)	17.6	40.3	10.0
Reading			
Average	238.9	265.4	205.6
Level 1 (%)	33.9	12.9	60.0
Level 2 (%)	42.1	44.8	26.7
Level 3 or above (%)	24.0	41.3	13.3
Numeracy			
Average	247.9	278.9	186.1
Level 1 (%)	31.7	15.4	70.0
Level 2 (%)	30.8	29.4	16.7
Level 3 or above (%)	34.8	50.7	13.3

	Douglas College (N=221)	Conestoga College (N=201)	College of the North Atlantic (N=30)
Employment and Income			
Currently working part-time (%)	12.2	9.5	30.0
Currently receiving EI (%)	7.2	15.9	13.3
Currently receiving IA (%)	19.9	12.4	73.3
Never employed (%)	18.6	7.5	16.7
Months worked in the past 3 years (average)	11.9	19.5	9.6
Barriers to finding or keeping a job (%)			
No barrier	1.8	9.0	6.7
One barrier	24.9	33.3	30.0
Two barriers	27.6	29.9	30.0
Three barriers	22.6	20.4	16.7
Four or more barriers	23.1	7.5	16.7
Household Income (%)			
Under $20,000	51.6	25.3	56.7
$20,000 to less than $40,000	24.0	21.4	0.0
$40,000 or more	18.6	51.7	16.6

Source: SRDC baseline survey.

Appendix B: Barriers to employment

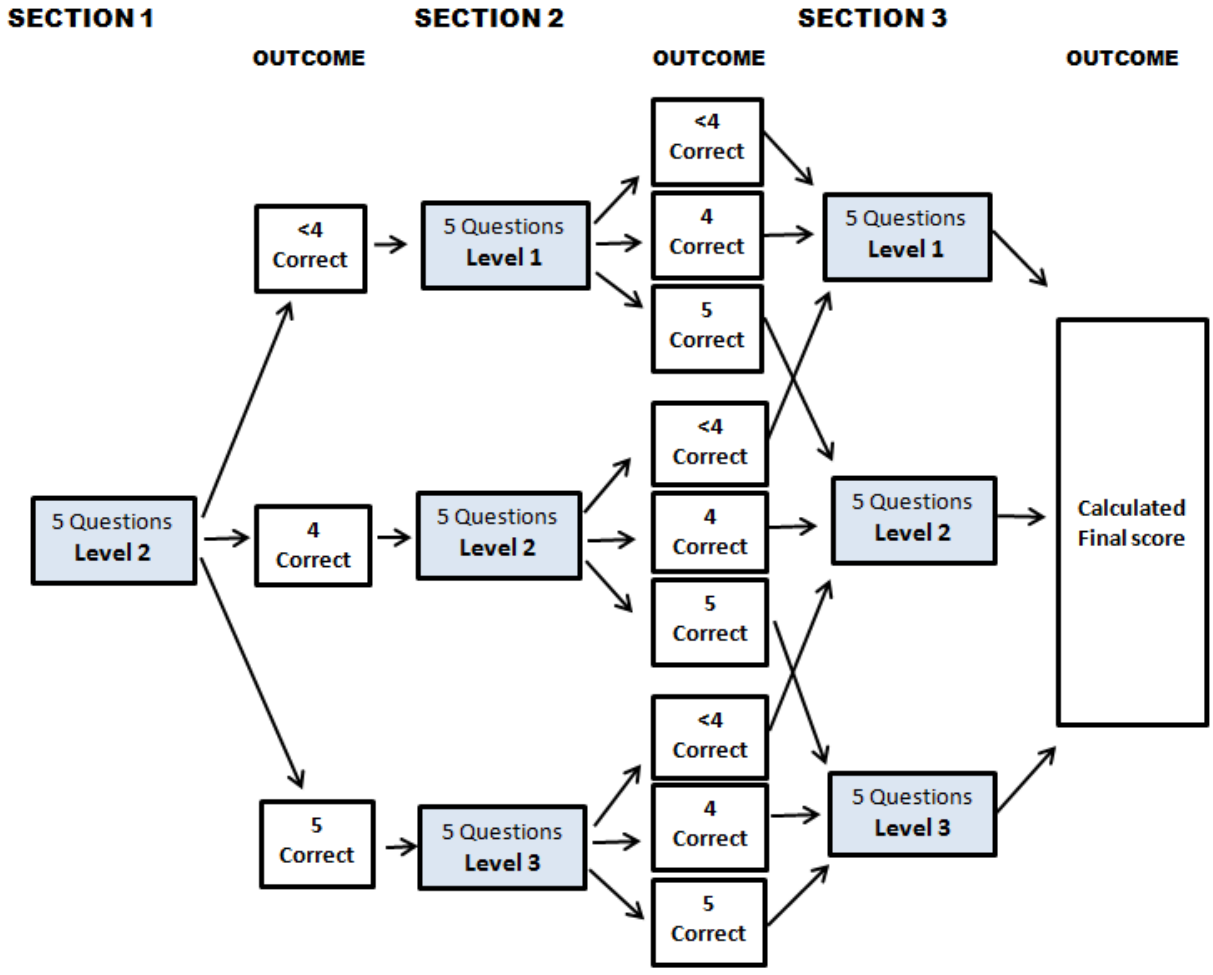
Table 5 Barriers to employment among current and past participants at Douglas College (%)

	Current FWSP cohort (N=221)	Pre-FWSP cohort (N=2151)	Difference	
Lack of childcare	10.4	6.5	3.9	**
Drug/Alcohol problems	0.9	1.1	-0.2	
Education	29.4	48.9	-19.5	***
Difficulty with English	37.1	11.8	25.3	***
Family issues	5.9	4.0	1.9	
Housing problems	2.3	3.5	-1.3	
Lack of job hunting skills	35.7	11.9	23.8	***
Learning disability	3.6	5.2	-1.6	
Legal issues	2.7	2.0	0.7	
Physical disability, illness or injury	12.2	11.6	0.6	
Transportation issues	11.8	11.7	0.0	
Limited work experience	50.2	35.8	14.5	***
Average number of barriers	**2.0**	**1.5**	**0.5**	***

Sources: FWSP baseline survey and Douglas College administrative data on previous Foundations projects.

Notes: Current FWSP participants were asked to select from a list of 15 possible barriers whereas previous cohorts had been asked to select from among a list of 12. To make the analysis comparable, only the 12 overlapping items were used for this analysis.
The stars at the end of the rows indicate that the difference among current and past participants are statistically significant. *** denote level of significance at 1%, ** at 5%, and * at 10%.

Appendix C: Detailed structure of the self-leveling Document Use and Reading assessments



Appendix D: Participants' understanding of the project

Table 6 Understanding of the project (%)

	Douglas (N=40)	Conestoga (N=73)	CNA (N=12)
If I am assigned to the program group, I will participate in the following activities:			
Develop a portfolio and learn about skills requirements	90.0	95.9	91.7
Complete assessments and surveys over the next 12 months	60.0	67.1	83.3
Don't Know	2.5	2.7	8.3
If I am assigned to the control group, I will participate in the following activities:			
Develop a portfolio and learn about skills requirements	45.0	24.7	41.7
Complete assessments and surveys over the next 12 months	65.0	56.2	91.7
None of the above	7.5	28.8	8.3
Don't Know	7.5	8.2	0.0
The information I provide in surveys will be kept confidential.			
Don't Know	0.0	1.4	0.0
True	100.0	98.6	100.0
False	0.0	0.0	0.0
I have a choice about whether I participate in this project or not.			
Don't Know	2.5	1.4	0.0
True	85.0	87.7	100.0
False	12.5	11.0	0.0
What chance do you have of being assigned to the program group?			
Don't Know	32.5	13.7	16.7
None	0.0	1.4	0.0
50%	65.0	83.6	75.0
100%	2.5	1.4	8.3

Source: Intake session exit survey.

Table 7 Experience of intake session (%)

	Douglas College (N=40)	Conestoga College (N=73)	CNA (N=12)
How comfortable were you signing the consent form?			
1 (Not at all)	0.0	0.0	8.3
2	5.0	2.7	0.0
3	15.0	9.6	0.0
4	20.0	24.7	8.3
5 (Very)	52.5	61.6	75.0
No Opinion	7.5	1.4	8.3
How clear was the presentation in the intake session?	0.0	0.0	0.0
1 (Not at all)	0.0	0.0	0.0
2	0.0	0.0	0.0
3	0.0	0.0	0.0
4	32.5	12.3	16.7
5 (Very)	67.5	87.7	83.3
No Opinion	0.0	0.0	0.0
How comfortable were you asking questions during the intake session?	0.0	0.0	0.0
1 (Not at all)	0.0	0.0	0.0
2	2.5	0.0	0.0
3	10.0	1.4	0.0
4	22.5	17.8	25.0
5 (Very)	65.0	78.1	66.7
No Opinion	0.0	2.7	8.3
How easy was it for you to complete the baseline survey?	0.0	0.0	0.0
1 (Not at all)	0.0	0.0	0.0
2	5.0	0.0	0.0
3	15.0	11.0	0.0
4	37.5	26.0	16.7
5 (Very)	42.5	61.6	75.0
No Opinion	0.0	1.4	8.3
How easy was it for you to complete the skills assessment?	0.0	0.0	0.0
1 (Not at all)	0.0	0.0	0.0
2	10.0	2.7	0.0
3	15.0	24.7	16.7
4	60.0	39.7	41.7
5 (Very)	15.0	31.5	33.3
No Opinion	0.0	1.4	8.3

Source: Intake session exit survey.

Appendix E: Career adaptability measures

Career Planning

- I have not really decided what my career objectives should be yet
- I have a strategy for achieving my career goals
- I know what I need to do to reach my career goals

Career Decision-Making Self-Efficacy

- How confident that you can…accurately assess how well your abilities are suited for the kind of work you want to do
- …find information about occupations you are interest in
- …find out the employment trends for an occupation over the next ten years
- …find out about the average yearly earnings of people in an occupation
- …talk with a person already employed in the field you are interested in
- …find information about education or training programs in the field you are interested in
- …select one occupation from a list of potential occupations you are considering
- …select one education or training program from a list of potential programs are be considering
- …choose a career that will fit your abilities and interests
- …identify employers, firms, institution relevant to your career possibilities
- …change jobs if you did not like your job
- …determine the steps to take if you are having trouble with an aspect of your job
- …identify some reasonable occupation or career alternatives if you are unable to get your first choice

Job Search Clarity

- I have a clear idea of the type of job I want
- I have very clear job search objectives
- I have a clear idea of the type of company I want to work for
- It is not very clear to me where I should be looking for a job

Job Search Self-Efficacy

- How confident that you can…use social networks to obtain job leads
- …prepare resumes that will get you interviews

- …impress interviewers during employment interviews
- …make "cold calls" that will get you a job interview
- …conduct information interviews to find out about careers and jobs that you are interested in pursuing
- …communicate your skills and experience in a way that will attract the interest of employers
- …plan and organize a weekly job search schedule
- …find out where job openings exist
- …choose a career that will fit your abilities and interests
- …identify employers, firms, institution relevant to your career possibilities
- …change jobs if you did not like your job
- …use a variety of sources to find job opportunities
- …search for and find good job opportunities

Appendix F: Propensity score estimation

The propensity score is estimated using a logit model, controlling for the baseline characteristics listed in Table 8. The table shows the coefficients estimates that were used to calculate propensity scores – positive coefficients indicate a higher likelihood, and negative coefficients a lower likelihood, of participation in Skills Enhancement.

Table 8 Propensity score model

Baseline characteristics	Coefficient	Standard error
Training site (Reference: Douglas College)		
Other colleges	0.44	(0.34)
Immigration status (Reference: Recent immigrant)		
Established immigrant	-0.38	(0.43)
Non-immigrant	0.28	(0.69)
Age	0.03*	(0.02)
Gender (Reference: Female)		
Male	-0.45	(0.33)
Marital status (Reference: With a partner)		
Without a partner	0.75**	(0.37)
Have children (Reference: No)		
Yes	0.81**	(0.32)
Educational attainment (Reference: High school or less)		
Postsecondary education or other	-0.63	(0.43)
Household income (categorical)	0.07	(0.06)
Worked in the past 3 years (Reference: Did not work)		
Worked up to 1.5 years	0.55	(0.42)
Worked more than 1.5 years	0.30	(0.38)
Number of barriers (Reference: Zero or one)		
Two	0.71*	(0.37)
Three or more	0.78**	(0.38)
Career related self-efficacy (average of career decision-making self-efficacy and job search self-efficacy)	0.33	(0.23)
Essential Skills (average of document use, reading, and numeracy)	0.00	(0.00)
Was highest level of education attained in Canada? (Reference: No)		
Yes	-1.06*	(0.58)
Received job offer in the past 12 months (Reference: No)		
Yes	-0.07	(0.35)
Had job interview in the past 12 months (Reference: No)		
Yes	-0.39	(0.32)
Indicator of missing values	-0.50	(0.44)
Constant	-4.13***	(1.49)
Observations	**254**	

Note: Indicators that are significantly related to the propensity to start Skills Enhancement are denoted by the following: * denotes that the relationship is significant at 10% level (p<0.1), ** at 5% (p<0.05), and *** at 1% (p<0.01).

Appendix G: Matching algorithm

The baseline characteristics of control group members and members of the program group who entered Skills Enhancement were different in a number of ways. In particular, Skills Enhancement participants were more likely to: a) have higher household incomes; b) have children; c) receive their training at Conestoga College or College of the North Atlantic rather than Douglas College; d) have received their highest educational credential outside of Canada; and e) have not gotten a job interview in the past 12 months. Details of these differences are illustrated in Table 9.

These individual characteristics may influence not only the Skills Enhancement participation decision, but also the outcomes of interest after training (i.e., career adaptability and Essential Skills improvements at follow-up). For example, it can be inferred from the estimation of propensity scores shown in Appendix F that those who attained their highest level of education outside of Canada are more likely to start Skills Enhancement training. Non-Canadian education might also be related to career adaptability or Essential Skills gains, either positively or negatively, and thus can be a factor that adds bias to our analysis of program impacts.

The purpose of matching is to create from the control group a set of individuals who closely resemble the Skills Enhancement group members in these characteristics, and to remove any potential individual differences that may give rise to such biases. To create this matched comparison group, an inverse probability weighting method is used to reweight the control group members in such a way that their distributions of baseline characteristics closely match the distributions of Skills Enhancement participants. Essentially, a weight is created for each member of the control group based on propensity scores, with bigger weights being assigned to those who would be more likely to start Skills Enhancement.[5] The rationale behind this is that the control group members whose baseline characteristics are a close match to Skill Enhancement participants, i.e. those with similar propensity scores, are reweighted so that they contribute more to the overall control group average for each outcome. The goal is to make the control group a closer match to the Skills Enhancement group to make changes arising in each group from baseline to follow-up more comparable. This allows us to estimate the impact of Skills Enhancement, as any biases arising from observable individual differences would have been minimized by the matching procedure.

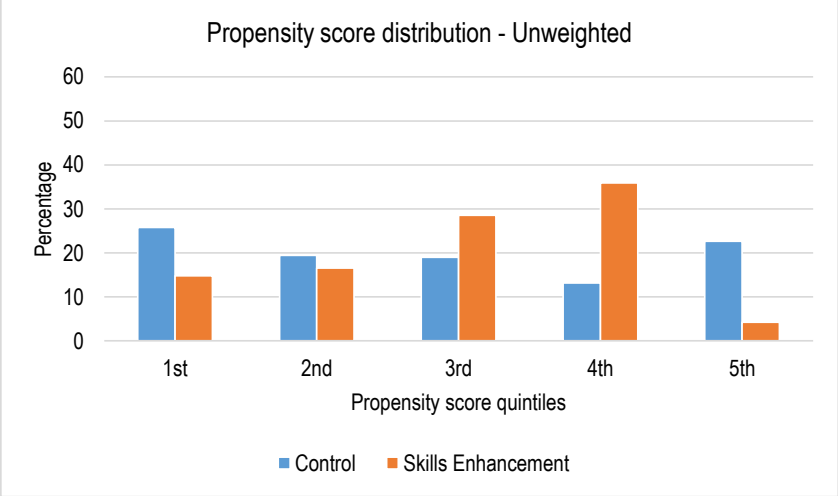
Figures 25 and 26 show that though before matching the distribution of propensity scores for the control group differed from that of the Skills Enhancement group, after matching the weighted propensity score distribution of the control group closely resembled that of the Skills Enhancement group.[6]

[5] This weight is created based on the following formula: $\text{Weight} = \frac{\text{Propensity score}}{1-\text{Propensity score}}$

[6] Figure 25 also illustrates that common support – one of the two statistical properties required for matching – is satisfied.

Similarly, Tables 9 and 10 present the baseline characteristics of the two groups before and after matching respectively. Though several differences were present before matching, when the control group is weighted according to propensity scores, the differences[7] became negligible.[8]

Figure 25 Propensity score distribution – Before matching



7 Because baseline characteristics are described through a mix of continuous and categorical variables, standardized differences are used to establish a common scale for comparison for both types of indicators.
Standardized difference between two continuous variables is defined as:

$$d = \frac{(\bar{x}_{\text{treatment}} - \bar{x}_{\text{control}})}{\sqrt{\frac{s^2_{\text{treatment}} + s^2_{\text{control}}}{2}}}$$

where $\bar{x}_{\text{treatment}}$ and $s^2_{\text{treatment}}$ denote the mean and variance of the covariate in the program group, respectively; $\bar{x}_{\text{control}}$ and s^2_{control} demote the mean and variance of the covariate in the control group, respectively.
Standardized difference between two categorical variables is defined as:

$$d = \frac{(\hat{p}_{\text{treatment}} - \hat{p}_{\text{control}})}{\sqrt{\frac{\hat{p}_{\text{treatment}}(1-\hat{p}_{\text{treatment}}) + \hat{p}_{\text{control}}(1-\hat{p}_{\text{control}})}{2}}}$$

where $\hat{p}_{\text{treatment}}$ and $\hat{p}_{\text{control}}$ denote the prevalence or mean of the dichotomous variable in the program and control groups, respectively.

8 This shows that the balancing property – the other statistical property required for matching – is satisfied.

Figure 26 Propensity score distribution – After matching

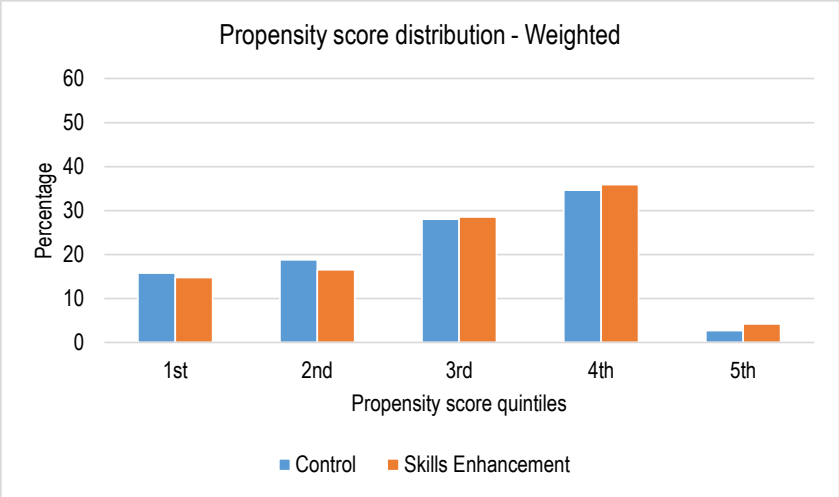


Table 9 Baseline characteristics – Before matching (unweighted)

	Skills Enhancement	Control	Standardized difference
Age	43.0	42.2	0.1
Household income (categorical)	4.6	4.0	0.2*
Career related self-efficacy – average	3.0	3.0	0.0
Essential Skills – average	264.5	259.0	0.1
Missing indicator	0.9	0.9	-0.1
Training site (%)			
Douglas	37.9	46.5	-0.2
Other colleges	62.1	53.5	0.2
Immigration status (%)			
Recent immigrants (%)	35.8	32.7	0.1
Established immigrants	26.3	28.3	0.0
Non-immigrants	37.9	39.0	0.0
Gender (%)			
Female	70.5	64.2	0.1
Male	29.5	35.8	-0.1
Marital status (%)			
Without a partner	61.1	62.3	0.0
With a partner	38.9	37.7	0.0
Have children (%)			
No children	42.1	55.3	-0.3**
Have children	57.9	44.7	0.3**

	Skills Enhancement	Control	Standardized difference
Educational attainment (%)			
High school or less	21.1	17.6	0.1
Postsecondary education or others	78.9	82.4	-0.1
Worked in the past 3 years (%)			
Did not work	23.2	28.3	-0.1
Worked up to 1.5 years	29.5	25.8	0.1
Worked more than 1.5 years	47.4	45.9	0.0
Was highest level of education attained in Canada? (%)			
No	56.8	48.4	0.2
Yes	43.2	51.6	-0.2
Job offer past 12 months (%)			
No	70.5	65.4	0.1
Yes	29.5	34.6	-0.1
Job interview past 12 months (%)			
No	49.5	39.0	0.2
Yes	50.5	61	-0.2

Note: Statistically significant differences are denoted by the following: * denotes that the relationship is significant at 10% level (p<0.1), ** at 5% (p<0.05), and *** at 1% (p<0.01).

Table 10 Baseline characteristics – After matching (weighted)

	Skills Enhancement	Control	Standardized difference
Age	43.0	42.1	0.1
Household income (categorical)	4.6	4.4	0.1
Career related self-efficacy – average	3.0	3.0	0.0
Essential Skills – average	264.5	263.0	0.0
Missing indicator	0.9	0.8	0.1
Training site (%)			
Douglas	37.9	37.4	0.0
Other colleges	62.1	62.6	0.0
Recent immigrants (%)	35.8	37.7	0.0
Established immigrants	26.3	25.2	0.0
Non-immigrants	37.9	37.0	0.0
Gender (%)			
Female	70.5	72.0	0.0
Male	29.5	28.0	0.0
Marital status (%)			
Without a partner	61.1	60.1	0.0
With a partner	38.9	39.9	0.0

	Skills Enhancement	Control	Standardized difference
Have children (%)			
No children	42.1	39.8	0.0
Have children	57.9	60.2	0.0
Educational attainment (%)			
High school or less	21.1	21.1	0.0
Postsecondary education or others	78.9	78.9	0.0
Worked in the past 3 years (%)			
Did not work	23.2	22.9	0.0
Worked up to 1.5 years	29.5	31.1	0.0
Worked more than 1.5 years	47.4	46.0	0.0
Was highest level of education attained in Canada? (%)			
No	56.8	56.9	0.0
Yes	43.2	43.1	0.0
Job offer past 12 months (%)			
No	70.5	68.2	0.1
Yes	29.5	31.8	-0.1
Job interview past 12 months (%)			
No	49.5	46.9	0.1
Yes	50.5	53.1	-0.1

Note: After adjusting for biases via propensity score matching, the standardized differences are all within an acceptable range of ±0.1, suggesting that the two groups are now balanced in terms of observable characteristics.

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