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An Analysis of a Foundational Learning Program in BC: the Foundations Workplace Skills Program (FWSP) at Douglas College

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Abstract

In this paper, we analyze the workings of a small-scale program involving foundational learning that is targeted at unemployed workers in Surrey, BC by exploiting information contained in the administrative data set that was compiled through its execution. Although this data set contains huge gaps and has a structure that is far from ideal, it contains some information regarding outcomes for the participants and outputs generated by the operations of the program. We investigate three outcomes for the participants of this program, namely i) a return to work, ii) a return to school, and iii) an improvement in the score obtained from a diagnostic test that gauges literacy and essential skills. We also make recommendations in regards to developing a data set that would be suitable for designing and carrying out an evaluation of labour market interventions such as the one covered in this paper.

JEL Code: *I21, J24*

Keywords: *literacy and essential skills, foundational learning, program evaluation*

Executive Summary

This paper analyzes the workings of the *Foundations Workplace Skills Program* (FWSP), a small-scale intervention providing foundational learning (also known as literacy and essential skills, or LES) that is targeted at unemployed workers situated in Surrey, BC. It involves exploiting information contained in the administrative data set that was compiled through its delivery. The service provider is the training group at Douglas College. The program is delivered at no charge to the participants. The targeted clientele consists of unemployed individuals of any working age, many of whom are immigrants or displaced workers, who are thought to be deficient in essential skills. The program is designed to further develop broadly applicable, general skills - without delivering any formal credentials - with an eye towards preparation for and facilitation of long-term labour force attachment. It is a re-employment service aimed at diagnosing and partially filling gaps in foundational skills in relation to the clients' career aspirations. A key and somewhat rare feature of the treatment is the elaboration of a customized plan to address these gaps at an individualized level.

The stated program objectives are to assist unemployed individuals in:

- developing an awareness, validation, and confirmation of skill levels (literacy, document use and numeracy) with the aid of the standardized *Test of Workplace Essential Skills* (TOWES) to provide direction for planning the appropriate next steps to employment or re-employment
- understanding and articulating their skills in relation to working in the labour market
- acquiring basic essential skills required for success in working, learning, and vocational life
- achieving long-term labour market attachment.

The intervention is structured according to three consecutive phases, each of which is considered to be a separate sub-program, which consist of activities such as:

1. assessing the participants, instilling awareness of the importance of LES, taking the TOWES exam for the first time
2. holding workshops, profiling, auditing, and articulating skills, relating skills to vocational goals, matching skills with job requirements, exposing participants to all nine of the essential and employability skills laid out by the Conference Board of Canada, instilling the notion of transferability of skills

and knowledge, conducting some research and providing some information regarding potential occupations

3. enhancing and developing foundational skills, targeting skills deficits, executing relevant software and internet applications available for career planning, learning how to learn with an eye on establishing a career, learning how to avoid skill loss in the future, providing some supplementary counseling regarding LES, retaking the TOWES exam (in order to assess progress).

Although this data set contains huge gaps and has a structure that is far from ideal for the purposes of empirical analysis, it does contain some information regarding outcomes for the participants and outputs that are generated by the operations of the program. Our analysis of the FWSP is carried out in four steps: 1) assess whether participants who completed the program's three phases and took the TOWES exam for a second time improved their score, 2) investigate whether there are, among these participants, any easily identifiable groups of individuals who seem to exhibit more improvement than others, 3) identify, if any, the types of participants who are more likely to complete (or to exit prematurely) the program, and 4) for each phase, analyze the likely outcomes and their potential determinants.

Out of the 1,625 participants who started phase 1, only 314 remained in the program long enough to complete phase 3 and retook the TOWES exam. For this select group of program participants, post-treatment test scores are significantly higher than their initial scores. The mean improvement for each subject was 51.9, 37.3, and 38.3 percent of a standard deviation for document use, numeracy, and reading, respectively. On the other hand, neither the initial score level nor the degree of improvement that was realized seem to be correlated with the probability of finding a job. It appears that younger participants exhibited greater improvements than did their older counterparts, all other factors held constant. While participants who took the TOWES twice improved their scores, it is impossible (given the data constraints) to know whether this improvement is attributable to the FWSP or simply due to the fact that participants are more familiar with the test the second time that they take it. The empirical patterns that we have uncovered pertaining to phases one and two suggest that the selection process leading up to phase 3, during which the second TOWES test is taken, constitutes a negative selection process in which the remaining participants tend to have lower cognitive skill levels.

We conclude our study by making recommendations in regards to developing a new data set that would be suitable for designing and carrying out a rigorous, scientific, empirical evaluation of labour market interventions like the one that is covered in this paper. In particular, we describe the construction of i) a potential 'control' group, ii) a survey questionnaire containing participant information, and iii) an

administrative data base that would track individuals' participation status and outcomes across phases of the program as well as over chronological time. The objective of all of these research instruments is to conduct a non-experimental evaluation of the benefits of a skills development program. Once credible estimates are attained, they could be related to cost estimates (which are usually much easier to obtain) in order to investigate the net benefits attributed to interventions such as the FWSP.

I. Introduction

Foundational learning is a category of adult education that is defined by Myers et al. (2011) as "instruction in the basic skills and learning strategies required for further learning or employment...targeted to adults who left initial education without qualifications or who have qualifications but need to improve basic skills." (p. 3). Most of the targeted individuals have either an education level below the grade 12 level and/or have below a level of 3 on the International Audit Literacy Survey (IALS) scale. Based on the survey of the literature authored by Myers et al. (2011), very little research exists on the returns to foundational education for any group residing in any country. Those authors are not aware of *any* rigorous studies that investigate how inputs to foundational learning activities affect outcomes of interest. Those authors go even further and claim that there is no evidence regarding the relationship between outputs of foundational learning interventions and outcomes. Unlike the case for job training and retraining programs that target displaced and disadvantaged workers, there are apparently no evaluative studies, either of the experimental type or the non-experimental type. The basic research infrastructure, such as the existence of appropriate data sets, does not exist.

We seek to address this void slightly with a case study involving an intervention called the Foundations Workplace Skills Program (FWSP). It is a popular, yet small-scale program involving foundational learning that is targeted at unemployed workers in Surrey, BC. The service provider is Douglas College, and it is funded through the Labour Market Development Agreement between HRSDC and the BC government.

Our primary objective is to analyze the workings of the FWSP by exploiting information contained in the administrative data set that was compiled through the execution of the program. Although this data set contains huge gaps and has a structure that is far from ideal, it contains some information regarding outcomes for the participants and outputs generated by the operations of the program. While much of the existing literature is based on very simple, binary measures of participation, we actually possess more detailed information that is measured on a more continuous scale. This allows us to glean some information on the workings of the program. We also investigate three outcomes for the participants of this program, namely i) a return to work, ii) a return to school, and iii) an improvement in the score obtained from a diagnostic test that gauges literacy and essential skills. Our objective is to estimate the impact of the intervention based on a before-after comparison. For the outcomes of returning to work and returning to school, this amounts to simply looking at the fraction of participants who eventually find a job or go back to school and when (during which program phase) the participants do so.

A secondary objective is to conduct some very rudimentary benefit-cost analysis derived from the calculations from the evaluative analysis.

While this program has a small scale (serving about 420 clients between November 2009 and October 2010), we view it as a pilot project that is worthy of scientific study. As Harmon (2011) states in his recent survey of economic returns to education – a state-of-the-art discussion paper - "The era of universality of policy design may be over and targeted action (at the 'local' population) will become the norm." (page 6). Small-scale programs of this type are likely to continue to be implemented in the future, often in affiliation with community colleges. Construed at a broad level, our aim is to compile a list of lessons learned from this experience. More specifically, we lay out the methodology for carrying out a rigorous, scientific evaluation of the FWSP. The scope of our empirical analysis is circumscribed by the limited data availability, but we attempt to discern as much information as possible on the characteristics of the clients, their patterns of participation within the phases of the program, the outputs of the intervention, and its outcomes.

II. Survey of the Literature

As mentioned above, the scientific literature regarding foundational skills is very undeveloped. It consists mostly of studies involving evaluations of programs designed to bolster literacy and essential skills (LES), but also a few studies involving the link between literacy and labour market outcomes such as earnings.

Perhaps the best known study within a Canadian context is authored by Green and Riddell (2003), although it is not an evaluative paper oriented around an intervention. These authors use a direct measure of literacy – specifically scores on the International Adult Literacy Survey (IALS) - to examine the influence of cognitive skills on earnings, and they address interactions with unobservable, non-cognitive skills. They find that cognitive skills contribute significantly to earnings (which is typically the metric employed for ultimate labour market success) such that some of the estimated returns that are conventionally attributed to formal schooling probably capture returns to literacy. A novelty of their work is their examination of interactions between the skills measured in literacy tests and the other unobserved attributes and non-cognitive skills. Perhaps surprisingly, they claim that the impact of literacy does *not* vary that much across the wide distribution of earnings. For the purposes of our current study, they affirm the importance of a cognitive skill that is an important factor in foundational learning, namely literacy, in generating earnings. At the same time, they assert that the acquisition of cognitive skills, such as literacy, is not a 'silver bullet' that also enhances the productivity of other skills. Having both cognitive and non-cognitive

skills enhances a worker's productivity, but having more of one skill does not enhance the productivity of the other. We note that the FWSP is designed to enhance both cognitive as well as non-cognitive skills.

Warburton and Warburton (2002) is a Canadian application that was written to serve as a toolbox for program evaluators. These authors report estimates for evaluative studies of job training programs for social assistance recipients in BC that were carried out in the late 1980s. Despite the fact that this piece is dated, it is relevant for our work in part because our data set comes from that province. We also note that despite the recommendations that these authors made regarding the development and design of data sets, virtually nothing of the kind has been produced in the interlude.

According to these authors, the five questions that program administrators should ask are the following.

- Exactly which potential impacts were studied?
- Is the comparison group that is employed by the researchers valid?
- Was the survey response rate adequate? Although the authors claim that it should be higher than 80 percent, in practice it is quite difficult to reach that rate.
- Was the regression analysis thoughtfully applied?
- If a two-stage process was applied in order to ensure exogeneity, was it statistically valid? More generally, these authors emphasize the importance of conducting sensitivity analysis.

Their survey indicates that even within a framework of a given intervention, evaluators should expect there to be a very high rate of variability across geographical sites. They stress the value of having monthly data, and give illustrations of why data at an annual frequency are too imprecise to be of much use for evaluative purposes. For example, studies that employ comparison groups that are based on annual data tend to under-estimate program impacts because the treated group is at greater risk of future unemployment than is the comparison group, which in turn is tied to the fact that the treatment group tends to experience greater employment-related problems ex ante.

These authors argue that the conventional wisdom that job training programs targeted at disadvantaged workers tend to be ineffectual might be too sweeping. Evaluative studies would be well advised to disaggregate the various

interventions more finely into components such as basic adult education, career training, vocational training, and academic courses. Their own research indicates that some forms of classroom training can be effective.

Another recent Canadian application is authored by Emery and Ferrer (2010). Like our work, they seek to evaluate a small-scale intervention delivered by an NGO (but funded publicly in part) in Alberta and targeted at workers facing barriers in the labour market. The *Immigrant Access Fund (IAF) Micro Loan Program* provides internationally trained (or educated) professional and trades people with loans to assist them in gaining credentials that Canadian employers will recognize. The workings of the program are clearly explained. As appears to be commonly the case in the literature, the authors state that "Although anecdotal evidence suggests that the IAF program has produced successes, there is no analytical evidence as to the overall economic value of the program" (p. 2). The evaluative metric that they estimate is the social rate of return to the IAF loan program. This calculation involves estimates of the opportunity costs of the loans (assuming that defaults are rare) as well as the direct costs of administering the program. In the spirit of the human capital literature, the estimated benefits are generated as the discounted present value of the future stream of earnings gains attributable to the accreditation (relative to counterfactual earnings). They conjecture that the annual real rate of return may exceed 33 percent.

This IAF program differs from the FWSP program in several ways. First, the barriers faced by the clients are dissimilar.   Given their backgrounds in the professions and skilled trades, the IAF clients have probably attained very high values of literacy and essential skills, and are in no need of foundational learning. The second difference lies in the nature of the intervention. The IAF involves very little in the way of counseling and assessment services, as its objective is very clear from the point of entry into the program (i.e. obtain accreditation for a specific profession and occupation), and the modes of treatment are narrowly defined and standardized given the occupation. It deals with the recognition of very specific human capital, while the FWSP deals with the development of very general human capital.

While their evaluative technique is quite sensible, the authors are handicapped by the absence of data regarding the program's participants. Ideally they would observe the post-treatment outcomes such as accreditation, employment, subsequent earnings, their earnings profiles going into the IAF program, and a broad set of demographic, educational, and regional attributes. Instead they are forced to rely on publicly available data sources, namely the Census

and the Labour Force Survey, from which they extract aggregated data on earnings by age crossed with level of education. The counterfactual earnings are those observed for high-school graduates. The administrative costs are not observed, but rather are calculated as 100 percent of the value of the loan, which is imputed at $5,000 (which was the typical value of the loans that were granted). The authors carry out a number of simulations of the real annual rate of returns attributable to IAF loans.

We do intend to follow Emery and Ferrer (2010) by incorporating some benefit-cost analysis into our program evaluation. We supplement that type of investigation, however, with as thorough an investigation of the workings of the FWSP as our administrative data set will allow.

We uncovered brief documentation regarding a specific, small intervention carried out by the *Momentum Calgary* organization.[1] This NGO offers an array of programs that, like the FWSP, seeks to develop foundational skills for clients who are at the periphery of the labour force. Their programming includes skills training, business development, financial literacy, micro-lending, and matched-savings programs. One of their programs called the Women's Venture Program assists women (approximately 24 per year) to develop a sustainable livelihood through self-employment. In the documentation cited above, the social return on investment technique is applied for evaluative purposes to the Women's Venture Program.

Warner and Vorhaus (2008) is a study from the UK that is oriented around a governmental strategy called 'Skills for Life'. This strategy was an initiative of the Federal government that was centralized and massive in scope (which makes it quite uncharacteristic for Canada) serving hundreds of thousands of participants. The strategy itself consisted of laying out an infrastructure for learning literacy and essential skills. A national core curriculum was introduced aimed at bolstering the literacy, the numeracy, and the English-as-a-second-language skills of targeted disadvantaged groups such as the unemployed, social assistance recipients, prisoners, those who are supervised in the community, the low-skilled, and younger adult learners. New initial assessment guidance and tools as well as guidelines for individual learning plans and a uniform set of qualifications were introduced. The educational services themselves were delivered by local schools and NGOs within that overarching 'Skills for Life' framework.

The study itself consists of a lengthy valuation of the impact of the strategy on learners. It was overseen by the National Audit Office, and the Federal Learning

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Skills Council compiled the data set that these authors exploit. Although it is considered to be an evaluative study, the methodology (like the one that we are forced to employ in our work) consists of only the before/after comparison technique applied to the treatment group; there is no control group. A good part of their investigation consists of analyses of take-up rates. The authors conducted a longitudinal analysis of test scores for literacy, numeracy, and English as a second language, but it is subject to a high attrition rate, as only 56 percent of the sample took the test twice. No attempt is made in their analysis to account for this sampling problem. The two outcome variables that they track are participation rates and 'achievement rates' between 2000-2001 and 2004-2005.[2] They focus primarily on trends realized over five annual observations, but they do cross-tabulate according to gender, starting level of literacy or numeracy, and the ethnicity (white, black, Asian). There is no investigation of determining factors; all of the findings are cross-tabulated proportions. They do track the proportions of participants progressing to different (loosely defined) levels of LES. The authors employ a scale for literacy and numeracy that consists of a continuum of five levels. They report 'achievement' rates in the form of a client reaching a higher level (in the form of a binary indicator) after having participated in an educational program.

Another outcome that was tracked (but referred to a longer term) has the following description: a) 'moving on' to other forms of learning or gaining employment (but not distinguishing between them), b) 'moving around' – staying with the same course, and c) 'moving out', which is not necessarily an unfavourable outcome. Despite the report's length and its high potential based on the compilation of a data set with a huge sample size (especially by the standards of this strand of the literature), the empirical analysis of outcomes is quite rudimentary.

These authors also interviewed all learners and developed a fairly detailed profile of background characteristics. During the first interview, the authors administered a questionnaire dealing with the attitudes and the perceptions of the participants.

Hollenbeck and Huang (2006) is a high quality, rigorous, multi-faceted study published by the *Upjohn Institute* using non-experimental, evaluative techniques applied to workforce development programs in Washington State. It consists of net impact analysis based on merged administrative data that linked program participation data to labour market histories. The authors also conducted benefit-cost analysis. Their comprehensive study covers a wide range of labour force

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[2] Each of these three domains, numeracy, literacy, and English as a second language, had courses divided into the following three types of skills: basic, key, and high school equivalent. Within each domain and type of skills, there were typically three or four qualification levels.

development programs, one of which is relevant for our purposes. Out of the eleven different interventions that were covered, one was 'Adult Basic Education Programs on Community and Technical college campuses'. In our recommendation for a design of an evaluative study, we have borrowed from their list of variables. A lesson that we draw from their work is that sometimes the event of exiting from a program has an ambiguous interpretation, especially if the client does not complete it. It is not necessarily an unfavourable outcome.

Like the aforementioned article, Schwerdt *et al.* (2011) is another fine application of an evaluative study involving adult learning in Switzerland, and it is somewhat unique in that it is experimental with randomized selection. It is not that relevant for our purposes, however, because it was not explicitly targeted at the unemployed, and while it did involve adult education, it did not necessarily involve *basic* adult education. The experiment consisted of granting vouchers to the adult population that could be redeemed for the purposes of gaining more training or education. In most instances, it was relevant for the labour market. Using a treatment group/control group comparison, they estimate the effect of the adult voucher on subsequent labour market outcomes. They pay a lot of attention to heterogeneity within the program's effects; overall the estimates of *average* labour market returns are low, which points to the existence of very strong selection effects. This finding is a common point in the literature that returns to adult education are not at all constant across the population. This study also illustrates the importance of conditioning on past outcomes, such as those tied to labour market activity. The estimates of positive returns stemming from the treatment dissipate with the inclusion of lagged dependent variables.

III. Description of the FWSP intervention

The service provider is the training group at Douglas College based in Coquitlam, BC, although (as mentioned above) the program site is Surrey. It is delivered at no charge to the participants. The targeted clientele consists of unemployed individuals of any working age, many of whom are immigrants or displaced workers, who are deficient in any of the nine essential skills articulated by the Conference Board of Canada.[3] At a very broad level, it is designed to further develop skills - without delivering any formal credentials - with an eye towards preparation for and facilitation of long-term labour force attachment. It is a re-employment service aimed at diagnosing and partially filling gaps in foundational skills in relation to the clients' career aspirations. A key feature of the treatment is the elaboration of a customized plan to address these gaps at an individualized level.

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[3] Reading text, document use, numeracy, writing, thinking skills, oral communication, continuous learning, working with others, and computer use.

The stated program objectives are to assist unemployed individuals in:

- developing an awareness, validating, and confirming (literacy, document use and numeracy) skill levels using the standardized *Test of Workplace Essential Skills* (TOWES) to provide direction for planning the appropriate next steps to employment[4]
- understanding and articulating their skills in relation to the world of work
- acquiring basic essential skills required for success in work, learning, and life
- achieving long-term labour market attachment

The program markets itself as being divorced from the formal schooling/training system and as being customized/individualized according to the needs and attributes of participants, a majority of whom do not feel at all comfortable with modern information and communication technology.

All of the candidates are referred by case workers (external to Douglas College) from a variety of social service agencies in the community. Although a few of those who are referred to the program are not accepted (i.e. those deemed to have very low literacy skills), the recruitment and initiation process is centered on the event of 'taking a skills test', which is the TOWES examination.

The TOWES test is designed to measure employability skills in three domains: document use, numeracy and reading. A particularity of the TOWES is that the questions and problems are based on workplace documents or tasks. For example, a test taker could be asked to extract information from a table (document use), to compute simple additions using an income tax form (numeracy), and to find the main idea of a passage in a trade manual (reading).

Over the past five years, demand for slots in the program always exceeded the estimates for the targets, i.e. their planned capacity. According to the final report submitted for the year 2009-2010, the program's administrators "continued to see a mixture of client referrals that had both high and low skill levels". This remark indicates that the intake for this program is very heterogeneous, which is frequently the case for any training program. This characteristic of the clients greatly complicates any empirical analysis of the impacts.

The intervention is structured according to three phases, each of which is considered to be a separate sub-program. While these phases are coordinated and

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[4] Further description of this examination is provided below.

integrated, their structure is not necessarily hierarchical. The participation patterns are quite fluid, as clients frequently exit the program without completing all three phases, and (as explained below) this outcome is not necessarily interpreted as a drop-out. Furthermore, certain participants can advance directly from phase 1 to phase 3. More detail on the phases appears just below.

1. assessing the participants, instilling awareness of the importance of LES, taking TOWES exam for the first time
2. holding workshops, profiling, auditing, and articulating skills (called 'portfolio development'), relating skills to vocational goals, matching skills with job requirements (there are two levels, a and b), exposing participants to all nine of the essential and employability skills laid out by the Conference Board of Canada, instilling the notion of transferability of skills and knowledge, conducting some research regarding potential occupations (such as learning about the entry points)
3. enhancing and developing foundational skills (including oral communication and working in a team), targeting of skills deficits, executing software and internet applications available for career planning,[5] learning how to learn with an eye on establishing a career, learning how to avoid skill loss, providing some supplementary counseling, retaking the TOWES exam

Each phase has a follow-up period of 12 weeks duration, which is not a very long period of time in order to observe outcomes. Furthermore, this 12-week period often overlaps with entry into a subsequent phase, which implies that we have fewer than 36 weeks of follow-up from an individual who has done all three phases. As we explain further below, the apparent sequential structure of the intervention does not have a longitudinal dimension that would facilitate empirical analysis. Although we can observe certain outcomes from a longitudinal perspective, most notably the improvement in the TOWES test score, the data set is primarily cross-sectional in structure.

The TOWES contains authentic workplace materials that are selected to accurately measure the skills needed for safe and productive employment in the areas of reading text, document use, and numeracy. Level 3 (of a total 5) is the recognized level that individuals require in order 'to learn new skills and transfer their knowledge from one situation to another successfully.' In the jargon of labour economists and human resource specialists, this implies a minimum level of general human capital that would be required in order to obtain some form of employment.

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[5] Some of the learning material is in hardcopy form.

IV. Self-Report of the FWSP

This study was authored by program manager Pam Tetarenko near the end of 2010. It consists of a basic descriptive profile of the clients as well as some analysis of the outcome of an improvement in the TOWES score. Her report is not based on as many observations as we have for our analysis, as she covers only the inflow of participants between November 2009 and October 2010 (N = 419). Over that period, there is some positive selection into the program, as they were over-subscribed, and (as mentioned above) those with very low literacy scores were not admitted. The first finding that might strike the reader is that given that the program is targeted at workers at the periphery of the labour market, the clients are fairly well-educated; 105 and 91 clients (out of a total of 415) reported holding university degrees and college degrees, respectively. The vast majority of these degree-holders were immigrants to Canada, and so many of them probably obtained their degree in their country of origin. The clients were almost evenly split by gender (48 percent male, 52 percent female) and by immigrant status (51 percent immigrant, 49 percent non-immigrant). The proportion of native speakers of English among those who took the first TOWES examination was 56 percent. The composition of the test-takers' native language is extremely diverse, covering thirty-five tongues including English. The age distribution of the clients is fairly wide across the working-age population; the shares are 10.5 percent for 16-24 year olds, 26 percent for 25-34 year olds, 32 percent for 35-44 year olds (prime-age workers), 26 percent for 45-54 year olds, and 7 percent for 55-64 year-olds (older workers). In our view, the fact that they are inclusive of all age groups is very appropriate given the labour shortages that are forecasted to emerge as the baby-boom retires.

The clients were asked to self-identify what they *perceived* to be the barriers to employment that they faced. Multiple responses from a client were recorded, and thus the shares sum to more than unity. By far the most common barrier identified by the client group was a lack of education, with 59 percent of them reporting this attribute as a self-perceived handicap. We find this figure surprising in light of the clients' educational profile that was mentioned above. This is consistent, however, with what the literature on the economics of immigration has revealed, namely that in the case of immigrant workers in Canada, the returns (in the form of wages and labour market earnings received in Canada) to foreign-obtained education are very low. The second most commonly reported barrier to employment was a lack of work experience, cited by 39 percent of the clients. Seventeen percent of them identified having a physical disability as a barrier, while 13 percent of them perceived that their job search skills needed further development.

Although we do not have this record in our data set, according to this report, 88 percent of the clients had received some form of social insurance over the past year, either in the form of EI benefits, of income assistance benefits, or 'reach back EI status' (receiving EI status over the past few years). Virtually all of the clients reside in the Surrey, BC catchment area, and so the population is very geographically concentrated. This factor is important, as the literature indicates that impacts from seemingly identical programs can vary tremendously by site.

The author did not develop an explicit typology of the clients, but it appears as though in qualitative terms, some of the more prevalent types could be described as follows: i) low-skilled non-immigrants who tend to be relatively young, lack experience, and perhaps education; ii) high-skilled non-immigrants who are older, more 'mature' (i.e. experienced), and engaged in career change (perhaps as a result of a disability); iii) high-skilled non-immigrants who were laid-off and perhaps not highly educated; iv) immigrants who tended to be at least somewhat educated but whose skills are not highly valued in the Canadian labour market; and v) aboriginal clients.

The one outcome that is analyzed in this report is the TOWES IRT Score Gain Averages, which are measured after a 2-11 week intervention. The program's administrators had hoped for an increase of 5-20 points (out of a scale of 0-500) based on pre-program averages of 234, 208, and 239 for the reading, document use, and numeracy portions, respectively. Instead, the realized gains on average were 33, 31, and 32, respectively, which obviously greatly exceeded aspirations. Note that these gains are remarkably similar across the domains. There is subjective evidence that many of them experienced gains in confidence and sentiments of self-worth. Interviews with the program's administrators suggested likewise. These reported gains were broken down between immigrants and non-immigrants, and the former group realized larger improvements.

It should be noted that only 133 out of a total of 419 clients who entered the program ended up taking the TOWES examination a second time. This certainly raises the question of selection, which the author does not address in her report. Conversations with the program director indicated that there is probably negative selection into phase 3 of the program. Those who did not take the examination a second time are somewhat likely to be those who exited the FWSP at an earlier stage because they were not in need of the curriculum and services offered in phase 3. In many of these cases, there might have been a positive outcome, but we will not necessarily observe all of them. In order to be selected to take the TOWES exam for the first time, they must have been diagnosed with a demonstrated skills deficit. In

our paper we conduct a more rigorous analysis for this outcome of taking the test twice.

V. Methodology

We conduct an exploratory analysis derived from the administrative data set that accompanied the FWSP. The analysis is done in four steps: 1) assess whether participants who completed the program's three phases and took the TOWES a second time improved their score significantly, 2) investigate whether there are, among these participants, any easily identifiable groups of individuals who seem to improve more than others, 3) identify, if any, the types of participants who are more likely to complete (or exit) the program, and 4) for each phase, analyze the likely outcomes and their potential determinants. Except for part 1 listed above, which is done by simply comparing the pre- and post-treatment TOWES scores, the analysis employs both descriptive statistics and regressions. A probe into the data set's content quickly revealed that we faced major challenges in our research endeavour. The very fluid structure of the outflows of participants, and to a lesser extent the inflows, as well as the transitions within the program, rendered some of the records contained in the data set difficult to interpret. There does not exist a decision tree laying out the structure of the sequence of the *intermediate* outcomes leading up to the *final* outcomes, along with the alternative destinations or events at each stage.[6] We note that intermediate outcomes might also be interpreted as program outputs. To provide an illustration, the intermediate outputs that are set out in the FWSP's documentation – such as 'actively working with the case manager',[7] 'participating in a job search', and 'participating in career planning'[8] - do not necessarily precede what we view as the final outcomes (finding a job, returning to education), and often no link is apparent at all in the data. In other words we only observe part of the throughput leading up to the output; the itineraries are neither complete nor distinct. As far as what one can observe, in almost all cases, these intermediate outcomes appear to function as alternatives to progressing on to phases II and III. The client has probably left the FWSP, but he/she might still be engaged in an action plan still focused on the objective of gaining employment. In other cases we tend to lose track of some clients without observing any follow-up. This related problem constitutes essentially a censoring of observations.

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[6] Ideally, the researcher would also have precise data on the points in term that entries, exits, and transitions occurred, from which durations of elapsed time spent could be derived.

[7] Recall that 'case managers' work outside of the FWSP, and are frequently those who referred the client in the first place. This outcome means that they have left the FWSP.

[8] This means more focused, deeper, specific career planning.

We would like to be able to estimate an equation whose dependent variable would exhaust the set of final outcomes, but the data constraints do not permit us to do this. The alternative estimation strategy that we adopt is to include the intermediate outcomes as an alternative mode to what we view as final outcomes. In most of our statistical and econometric analysis, we estimate either binary or multinomial discrete choice models of outcomes as a function of pre-determined outputs and client characteristics. The outline for our equations is listed below.

For our equation that models the broadest set of outcomes, the list of modes for the dependent variable is:

1. found a job
2. returned to school
3. dropped out of the program altogether
4. 'other', which includes going back to the case manager, active job search, career placement counseling, but *outside* of the FSWP).

In the case of a narrower equation that models final outcomes subject to certain conditions, the two modes are i) found a job and ii) returned to school.

For the equation that models outcomes after phase 1, the list of modes for the dependent variables is:

1. enter phase 2
2. found a job
3. returned to school
4. dropped out of the program altogether
5. 'other', which includes going back to the case manager, active job search, career placement counseling, or progressing directly to phase 3.

The list of exogenous variables are gender, age (which is specified as a set of dummy variables), English as mother tongue, immigrant status, the highest level of education obtained, and the first test score on TOWES.

There are a total of six estimating equations.

a) The dependent variable is the set of final outcomes.
b) The dependent variable is the set of outcomes after phase 1.
c) The dependent variable is the set of outcomes for phase 2 conditional on participation
d) The dependent variable is the set of outcomes for phase III conditional on participation.

e) The dependent variable is the TOWES score improvement based on a selected sample.

f) The dependent variable is a dummy variable equal to 1 if the participant took the TOWES a second time.

VI. Empirical findings

The data provided by Douglas College contained information on 1,927 individuals who started phase I of the FWSP between June 2006 and September 2011.[9] Among these 1,927 individuals, 1,625 had valid information about their gender, age, educational attainment, mother tongue, and their 'pre-treatment' TOWES scores for reading, document use, and numeracy.[10] Table 1 presents descriptive statistics for the 1,625 participants. Note that since our estimating sample reflects a longer interval than the one upon which the report by Tetarenko (2011) is based, the sample statistics are not identical. A majority of the participants (56 percent) are females. Forty-four percent of the participants are immigrants, and slightly more than half have English as a first language. About sixty percent are aged between 25 and 44 years. Participants are by no means poorly educated: 46 percent of them have some post-secondary education experience, and 23 percent graduated from a university. Panel E of Table 1 presents the TOWES scores for all phase 1 participants using the IALS (International Adult Literacy Survey) 500-point scale. These scores will be used as the baseline for the purposes of analyzing those individuals who completed all three phases and took the TOWES for a second time. Comparing the initial test scores of all phase 1 participants to the initial scores of participants who took the TOWES a second time will inform us on whether there is systematic selection based on initial essential skills levels in completing FWSP three phases.

Before moving on to the analysis of the FWSP participant outcomes, it is worthwhile to examine some of the potential employment barriers faced by participants. Table 2 presents the barriers to employment perceived by the participants. By far the most important barrier perceived by participants is educational in nature. Fifty-eight percent of participants perceive that their educational attainment (or lack thereof) is a hindrance in gaining and/or retaining employment. In our view, this

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[9] The data contain information on individuals who started the program after October 1st 2011, but we decided not to keep these individuals for our analysis, as we think that they did not have enough time to complete the program.

[10] Among the 302 discarded individuals, 272 had missing information about their educational attainment, 249 about their mother tongue, 246 about their age, 18 about their document-use test score, 7 about their reading test score, 4 about their numeracy test score, and 1 about their gender. One of the variables not used for this study is the 'last year of study'. Some participants entered the year they last attended school, while others entered the number of years since they were last in schooling or their age when they left schooling. As perfectly disentangling the last two answers is not possible for many participants, we simply ignored this variable, despite the fact that it could have been useful when analyzing the factors correlated with 'successful' training.

finding is a double-edged sword. On one hand, it is particularly surprising given that these participants are relatively well-educated compared to the rest of the Canadian population, not to mention the unemployed population. This fact could be in part explained if participants did not study in Canada and feel (correctly or not) that Canadian employers do not perceive these diplomas as equivalent Canadian diplomas. Unfortunately, the information on the exact place of study is not available from the data, although we do assume that in the case of immigrants, the diplomas were not awarded in Canada. One the other hand, this revelation also suggests that many of the participants are not affected by an over-confident attitude and are motivated to improve their cognitive (and perhaps non-cognitive) skills. The second most important barrier perceived by participants is the lack of work experience (perceived by 43 percent of participants).

We now turn to an analysis of the outcomes for the phase 1 participants. When investigating the potential benefits of the FWSP program, the first thing that could come to mind is the question of whether participants improved on their TOWES scores by the end of the program. Indeed, this issue is highlighted in Tetarenko's (2011) report. As is already apparent from Table 1, however, fewer than 20 percent of the initial inflows of participants participated in the 'post-treatment' TOWES. Hence, not only do we need to look at the improvement of individuals who took the second test, but we also need to look carefully at the outcomes and characteristics of those who did not take the test twice (for any number of reasons). We start by analyzing the score improvements for the second test takers, and we then proceed to examine the case of individuals who exited the program before taking the second test.

VI.1 TOWES Score Improvement

Out of the 1,625 participants who started phase 1, 314 went through to phase 3 and took the TOWES for a second time. Although this is a highly selected sample (19.3 percent of the original sample), one can still learn something about participants who completed all three phases. Table 3 presents evidence on TOWES pre- and post-treatment scores as well as the improvement for these 314 participants. Panel A presents descriptive statistics for the initial (pre-treatment) test scores for the essential skills of document use, numeracy, and reading for both participants who took the TOWES for a second time (Panel A.1) and for participants who did not (Panel A.2). The mean test scores do not have any natural interpretation and are therefore not interesting *per se*, but the standard deviations in these test scores are useful to gauge the magnitude of the TOWES score improvements.

For the purpose of our study, the most important finding drawn from Panels A.1 and A.2 is that when we compare the initial scores of participants who took the TOWES a second time to the initial scores of participants who only took the TOWES once, we realize that second-time TOWES takers had significantly lower initial levels of essential skills than the other participants. This is true for all three skill domains.

If we compare the mean differences to the standard deviations of initial TOWES scores (see Table 1), we can see that these differences are large, representing between 39 to 58 percent of a standard deviation.

Panels B and C in Table 3 present descriptive statistics for the post-treatment test scores and pre/post TOWES improvement, respectively. Post-treatment test scores are significantly higher than the initial scores. By comparing the mean improvement for each subject relative to the standard deviations of the initial scores (of all participants in Table 1), we realize that the magnitude of the improvement is large; they represent 51.9, 37.3, and 38.3 percent of a standard deviation for document use, numeracy, and reading, respectively. If we use the standard deviations of initial scores for participants who took the test for a second time as a point of comparison, we obtain even larger numbers. This finding is encouraging, but given the absence of any comparison group for our analysis, it is not possible to conclude that this improvement should be attributed to the participation in the FWSP. We will return to this issue below in the discussion section.

Ideally, one would like to convert TOWES score improvements into potential earnings increases. Green and Riddell (2003) associate an increase of 1 point in average literacy score[11] (on the 0-500 IALS Scale) with approximately a 0.29 percent increase in annual earnings. The mean improvement in average TOWES scores for our sample is about 19.7 points. That would suggest (using a back-of-the-envelope calculation) an annual earnings increase of about 5.7 percent. We note that this figure is in the range of estimated returns to a year of education that has been reported in the literature. Note that in doing this extrapolation exercise, a multitude of assumptions were made that are not likely to apply in practice. First, we have to assume that the two groups are similar or that the link between literacy scores and earnings are invariant across the population.[12] Note that the sample analyzed in Green and Riddell (2003) differs systematically from the one analyzed in this study: Green and Riddell (2003) look at "full-year/full-time non-self-employed workers." The mean average literacy score in their study is 297, which is significantly higher than the scores we observe from the FWSP participants. Also, their estimate is based on strictly cross-sectional variation in individual scores, while ours should be based on pre- vs. post-treatment scores (within-individual differences). These two techniques could yield different estimates if we had access to pre- and post-treatment earnings information. Finally, it is crucial to emphasize that in the absence of a control group, it is impossible to attribute the TOWES score improvement to the FWSP. It is a greater stretch to attribute a potential earnings increase to the FWSP.

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[11] Green and Riddell (2003) use an average score instead of using separate scores from all three domains since the correlations across domains are close to 0.9 in their data. This is not the case for the present study. Our estimated correlations are much lower, between 0.36 and 0.57.

[12] i.e. the group that forms the sample in the IALS versus our FWSP sample.

In doing our extrapolation exercise, we also have to assume the increase in TOWES scores would lead some individuals to find a job. In order to test how likely this assumption is to be satisfied, we regressed a dummy variable that assumes a value of one if the individual found a job at the end of phase 3 on a set of personal characteristics and the individual's average (over the three domains) TOWES improvement (and average initial level). The results are presented in Table 4.[13] Whether or not we control for personal characteristics, neither the initial level nor the improvement seem to be correlated with the probability of finding a job.[14] Taken at face value, this finding casts even more doubt on the soundness of our back-of-the-envelope calculation above.

Despite a significant average increase in test scores, there is a fair amount of heterogeneity. Surprisingly, a non-trivial minority of participants did *worse* on the post-treatment test than on the pre-treatment test. Specifically, 17.2, 25.8, and 22.3 percent had lower scores in the post-treatment test in document use, numeracy, and reading, respectively. Since it seems illogical to attribute such deteriorations to a treatment effect, this suggests that the test scores are a somewhat noisy indicator of the true level of these particular cognitive skills, which is a somewhat unobservable variable.[15]

We now look into TOWES score *improvements* in more detail in order to discover whether the improvements in scores presented in Table 3 are driven by participants with specific characteristics. Table 5 presents the results obtained from regressing TOWES score improvements for each skills domain on a series of personal characteristics: gender, age, mother tongue, immigrant status, educational attainment, and initial test scores. Although the coefficient estimates of most age-dummy variables are not statistically significant, it seems that younger participants showed greater improvements than their older counterparts, all other factors held constant. Perhaps surprisingly, the educational attainment coefficient estimates do not suggest any clear pattern when it comes to TOWES improvement. The estimates fluctuate significantly across the domains. We next interact the variables of educational attainment with immigrant status in order to determine the extent to which systematic differences might exist between immigrants and native-born Canadians. If anything, the interaction terms between immigrant and the educational attainment dummies seem to indicate that immigrants' education levels are even less closely associated with score improvement than is the case for the Canadian born.

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[13] Each column represents a separate regression. Note that there is no dummy variable for individuals ages 65 and over, since no participants in this age category took the TOWES for a second time.

[14] We estimated regressions where we interacted the initial TOWES level with the variable for the TOWES improvement. The results are similar: the variables do not seem to be linked with the probability of finding a job (for the range of TOWES scores found in our sample).

[15] A discussant asked the authors the following rhetorical question: how often has a student pleaded with us that his/her poor performance on an examination under-predicted his/her true command of the course material?

In investigating the effect of education, one could be concerned that the potentially high correlation between education attainment and initial test scores is driving 'erratic' behaviour of the education parameter estimates and undermining their precision. It turns out, however, that this is not the case. Excluding the initial TOWES scores from the regression does not affect the educational attainment estimates.

The more interesting finding when looking at participants' TOWES improvement seems to be the (partial) correlation between initial TOWES scores and improvement in each of the three skills domains. The coefficient estimates are highlighted in a box. The numbers on the diagonal of the box capture the link between the initial test score in one domain and the improvement on the second test for the same domain. These numbers are all negative, statistically significant (at any conventional confidence level), and economically large in magnitude. Each extra point scored on the original test in a specific domain is associated with a 0.5 point *weaker* improvement on the second test for this specific domain. This empirical pattern, which applies to all three domains, is analogous to a regression to the mean effect. This finding is not surprising, as we would expect that it is harder for someone to improve on their score if they performed very well on the first test. Someone who did relatively badly on the first test is less likely to do worse on the second test. The off-diagonal elements in the box contain the pre-/post- treatment, cross-domain partial correlations. Basically, the numbers inform us about whether being skilled in one domain may help in improving in another domain. For example, we can see that an extra point in the initial reading test is associated with a 0.2 point improvement in document use. This seems to suggest that the skills analyzed here could function as complements when it comes to this improvement variable.

Overall, aside from the obvious link between initial test score and score improvement, the TOWES score improvements do not seem to be solely driven by any specific participant characteristics.

VI.2 Participation in the Second TOWES

As mentioned above, only a fraction of phase 1 participants wrote the TOWES for a second time. Table 6 presents the results from a regression equation that models the selection process for writing the TOWES for the second time. More precisely, Table 6 presents estimation results obtained from regressing a dummy that assumes a value of 1 if the participant took the TOWES for a second time and 0 otherwise. The estimated model is a linear probability model (LPM), which is selected because the interpretation of the coefficient estimates is straightforward. Results obtained from the probit are almost identical, except for the fact that the dummy variable for the category of individuals aged 65 and up is dropped from the estimation as it perfectly predicts the outcome (no individuals in that age range wrote the TOWES for a second time.) The specification in the first column controls only for the impacts of age, gender, mother tongue and immigrant status, while the

specification in the second column also controls for educational attainment. The third column presents results obtained when controlling for the influences of age, mother tongue, immigrant status, educational attainment, and pre-treatment TOWES scores.

The results from Table 6 suggest that once we control for the effects of mother tongue, immigrant status, age, educational attainment, and pre-treatment TOWES scores, females are 7.8 percentage points more likely to take the TOWES for a second time than males. Older individuals (aged 65 and up) are less likely to retake the test. Individuals for whom English is their mother tongue are 10 percentage points less likely to retake the test than are individuals with another mother tongue. Educational attainment seems to be positively correlated with the probability of retaking the test. High school 'dropouts' and university graduates are 4.5 percentage points less likely and 6.9 percentage more likely, respectively, to retake the test than are high school graduates. Note that these numbers are driven by the presence of immigrants (see column 4). Finally, pre-treatment test scores for document use are negatively correlated with the probability of retaking the test. Although the estimates for the TOWES scores seem small in magnitude, one can better put these numbers into proper perspective once we realize that the estimates imply that someone with a pre-treatment test score in document use that is one standard deviation above the average would have a 4.4 percentage point lower probability of retaking the test than an otherwise similar person who received the average score on the initial test. Overall, one can clearly see that the attrition process is not random: individuals with lower TOWES scores who are more highly educated and for whom English is not their mother tongue are *more* likely to continue in the program long enough to take the TOWES for a second time. Interestingly, these characteristics are not all associated with encountering greater difficulties finding work. One could imagine that language deficiencies and poor test scores would be associated with a lower probability of finding a job, while higher educational attainment could be associated with a higher probability. This particular set of estimated coefficients might be capturing unobservable traits that are correlated with those regressors.

VI.3 Outcome by Phase

Given that more than 80 percent of participants did not write the TOWES a second time, it is worthwhile examining the outcomes of all participants regardless of whether or not they completed Phase 3. While attrition usually causes problems for researchers evaluating the benefit of a program, knowing the causes of the attrition may be as informative as knowing what happened to participants who fully completed the program.

Table 7 presents the outcome (or output) distribution of participants for each phase and for their 'final' outcome. Before presenting the results, it is

important to note that, for most participants, for reasons explained above tied to the structure of the data, we are forced to treat all outcomes as final except for the event of moving to the next phase. That is, if one's outcome for phase P is anything different from moving to the next phase (phase P+1), we do not observe this participant for phase P+1 and thereafter. For example, if someone found a job by the end of phase 1, we do not observe this individual during phases 2 and 3. This may seem natural for an outcome such as finding a job or going back to school, which are nearly always considered to be final outcomes. There is little ambiguity in interpretation in this case. In our paper, however, this is also the case for outcomes that we might consider as being intermediate (and therefore more like program outputs), such as searching for a job or consulting with a case manager.

Another complicating issue involved with interpreting the results presented in Table 7 is that not all participants started (at least according to the available data) the program in phase 1. This is the reason why the number of participants who started phase 2 is slightly larger than the number of phase 1 participants multiplied by the proportion of individuals who moved on to phase 2 (i.e. 694 is larger than 1,625*0.417). For each phase we divided the participants' outcomes into five categories, namely 1) moved on to the next phase, 2) found a job, 3) returned to school, 4) did not complete the phase, or 5) had a different outcome. This last, residual category ('Other') includes outcomes such as searching for a job, working with a case manager, participating in career planning, continuing on to a phase other than the next, or joining another program altogether.

Panel A of Table 7 suggests that fewer than fifty percent of phase 1 participants started phase 2. 9.5 percent found a job before the end of phase 1, while 17.7 percent returned to school. The encouraging finding here is that a significant fraction of the participants who did not continue on to phase 2 of the FWSP had what appear to be 'desirable' outcomes. A non-negligible fraction (15.9 percent) did not complete phase 1, which implies that they dropped out immediately. The rest of the participants entered phase 3 directly (2.1 percent), were searching for a job (2.7 percent), working with a case manager (4.3 percent), or participating in career planning (6.8 percent).

Panel B indicates that 63.7 percent of the phase 2 participants commenced phase 3, which is a higher continuation rate than was the case between the first two phases. 6.3 percent found a job before the end of phase 2, while 10.2 percent returned to school. 11.2 percent did not complete phase 2. The rest of the participants entered phase 1 (1.6 percent, a surprising regression process), were searching for a job (2.3 percent), working with a case manager (1.7 percent), or participating in career planning (2.9 percent).

Panel C shows that 13.3 percent of phase 3 participants found a job before the end of phase 3, while more than 40 percent returned to school. 16.2 percent did not complete phase 3. The remainder of the participants either worked with a case manager (19.9 percent) or joined another program (5.8 percent). Panels A to B

suggest that most of the attrition occurs during phase 1; most participants who reach phase 2 will also participate in phase 3. What is more revealing is that by comparing Panels A and D, one can see that most people that eventually found a job, and about half of those who eventually went back to school, did so during phase 1. More precisely, 58.6 (=9.5/16.2) percent of the participants who found a job and 50.3 (=17.7/35.2) of the participants who returned to school did so during phase 1. Given that we have already seen that participants with higher initial TOWES scores tended not to continue in the program through phase 3, the numbers listed in Table 7 are in line with the conjecture that participants with higher levels of skill may be finding jobs more easily or deciding to go back to school sooner. We return below to discuss this point further.

Tables 8, 9, 10, and 11 present the results from estimating separate linear probability models (LPM) whose dependent variables represent the more interesting possible outcomes presented in Table 7: i) moving on to the next phase, ii) finding a job, iii) returning to school, or iv) 'dropping out' of the program.[16] Table 8 contains the results from the equation modeling the final outcomes, irrespective of the stage at which the outcome was achieved. A handful of coefficient estimates are statistically significant at standard confidence levels. Compared to participants aged 35 to 44 years, participants 25 to 34 years and 45 to 54 years are 3.9 and 5.3 percentage points more likely to find a job over the course of the program, respectively. Note that this age pattern is not monotonic. Younger participants are more likely to return to school than older ones, but they are also more likely to drop out of the program. Native English speakers are less likely to go back to school than participants for which English is not their mother tongue. Educational attainment does not seem to be associated with a higher probability of finding a job, which is a somewhat unexpected result. What is less surprising is the finding that high school dropouts are more likely to drop out of the program. The results for test score parameter estimates suggest that, if anything, higher reading test scores are associated with a lower probability of finding a job, but with a higher probability of returning to school. The one point that seems apparent in examining the results in Table 8 is that the parameter estimates for participants' final outcomes are, for the most part, imprecisely estimated. This is also true for phase 1, 2, and 3 outcomes (presented in Tables 9 to 11).

When we examine the phase 1 outcomes (Table 9), we see that females are 11.9 percentage points more likely to move on to phase 2, and 4 percentage points less likely to find a job or to return to school. Participants with higher levels of educational attainment are more likely to continue on to phase 2 and less likely to

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[16] Although we present the LPM results, we also estimated multinomial logit (MNL) models and obtained similar results. We chose to present the LPM results since the interpretation of the coefficient estimates is straightforward, and since we are not interested in predicting probabilities. Furthermore, for each outcome, we estimated two other specifications. One was similar to the one presented in the tables but excluded the educational attainment variables as well as the TOWES scores, and the other excluded the TOWES scores only. The results for the remaining coefficient estimates are robust to these exclusions.

return to school than are high school graduates. Native English speakers are less likely to move on to phase 2. Higher initial TOWES scores for document use and reading are associated with a lower probability of moving on to phase 2, but with a higher probability of returning to school. Interestingly, test scores are not associated with a higher or lower probability of finding a job. We obtain a similar finding when looking at phase 2 outcomes (Table 10), although the pool of participants is significantly different than during phase 1. Higher initial reading test scores are associated with a lower probability of moving to phase 3 and a higher probability of returning to school.

To summarize the set of findings, examining the regression results for phase 2 and 3 outcomes separately does not seem to add much insight into the analysis. This is not entirely surprising, as most of the action in terms of attrition happens during phase 1. We thus have less confidence in empirical patterns emerging from the later phases.

VI.4 Discussion of Regression Results

While participants who took the TOWES twice improved their scores, it is impossible to know whether this improvement is due to the FWSP or simply due to the fact that participants are more familiar with the test the second time that they take it. Disentangling these two potential confounding factors would require comparing these improvements of program participants to those of a 'control' group taking the form of a group of individuals apparently similar to the participants but not having participated in the FWSP. An adequate control group is necessary if one wants to properly measure the benefits of any skills development program. The fact that most of the 'action' occurs during Phase 1, which usually lasts only a few days, renders it even more difficult to gauge which outcomes are actually attributable to the 'treatment'.[17]   The empirical patterns that we have uncovered pertaining to phase 1 suggest that the selection process leading up to phase 3, during which the second TOWES test is taken, constitutes negative selection in that the remaining participants tend to have lower cognitive skill levels. Had all initial participants taken the test a second time, the average improvements in scores might well have been lower based on our result of a negative estimated coefficient for the variable of the initial score.

VII. Application of the Typology and Research Design to the FWSP

From the goals explicitly stated by FWSP, it is clear that two broad types of learning (as set out in the 'typology' of learning categories for the returns to adult education project) are involved in the studied intervention: foundational learning and labour-market-related learning. Hence, in principle, the participants' final

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[17] By 'action' we mean that it is determined at this stage whether the vast majority of the clients appear to be either in need of significant development of foundational skills or of identification of a skill gap.

intervention outcome should be affected by the interaction of these two types of learning. Even in the presence of an appropriate comparison group, it would not be possible to disentangle the separate impacts of these learning types on labour-market outcomes and/or on skills levels – unless one assumes that labour-market-related learning (e.g. conducting research and providing information regarding potential occupations) is totally independent of foundational skills formation. It would not be possible to attribute an observed outcome to solely one of them. It is quite possible that the two types of learning involved in the FWSP reinforce (or weaken) each other in determining the participants' final outcomes. Note that in a cost-benefit analysis, failing to disentangle the separate effects of these types of learning is not problematic; the subject of the analysis is the whole intervention rather than on a particular type of learning.

The main challenge in identifying the benefit of the intervention is to observe an appropriate comparison (control) group. The following discussion refers to Table 1, labeled "Proposed hierarchy of evidence for research designs estimating causal impacts", contained in *The State of Knowledge Review of the Wider Benefits of Adult Learning.* If the research design were a randomized or natural experiment, it would be possible to identify the impact of the FWSP fairly easily, as one would only require knowledge of who was in the treatment and who was in the control groups, and subsequently to observe the final outcome for *all* participants – assuming that the randomization was assured. We insist on observing the final outcome of all participants, as any attrition activity (which could be the result of the intervention) would jeopardize the identification of its impact.

Since the FWSP cannot be considered at all to a randomized (or natural) experiment, the identification of the FWSP's effects depends crucially on the available information regarding a comparison group. As it stands, the evidence from analyzing the FWSP would not be considered as evidence of the 'upper tier' research design caliber, but rather of the 'lower tier' caliber. This is true even if we ignore the potentially serious attrition problem.

In future research, we hope to be in a position to raise the caliber of our research design to 'middle tier'. To this end, we make recommendations in regards to developing a suitable data set and an appropriate empirical framework for evaluating adult learning programs. In so doing, we draw from our own experience, the study by Warburton and Warburton (2002) for the Canadian context, and the work by Hollenbeck and Huang (2006) for the US context.

As mentioned above, the absence of a comparison group makes it impossible to measure adequately the impact of the FWSP on its participants. One could use the fact that the program was over-subscribed – that some potential program participants had to be refused – to 'construct' a control group. If applicants were denied access to the program *at random*, then we could expect these individuals to be similar to the ones that participated in the program. By contrast, to construct a comparison group comprised of those applicants who were assessed to be least (or

most) likely to benefit would be a flawed strategy. By comparing the outcomes of the two groups, it would now be possible to measure the effect of the FWSP. One potential difficulty would be to follow the rejected applicants over time, but in theory doing so should be possible.

One notable advantage of the US studies is that they typically are based on (relatively) high frequency data reporting earnings and labour market activity; specifically quarterly data would be suitable. In the case of Canadian workers, the ROE file (a data set employed in administration of the EI program) gives very detailed information on the participant's labour market history, provided that he/she separated from his/her employer.   If the comparison group consists of any worker who has not experienced a separation over the relevant period, the only information on labour market activity that exists is annual data on earnings, from which one cannot separate the hourly wage from the number of hours worked. One cannot discern whether a bout of unemployment, which obviously reduces earnings below the normal level, occurred during any calendar year, nor can one infer anything about its length.   Pre-treatment earnings can only be assessed if the window of measurement, which is a calendar year, ended before the spell of unemployment commenced. By the same token, post-treatment earnings can only be assessed if the window of measurement, which is a calendar year, commenced after the spell of unemployment ended. There cannot exist any overlap between the spell of unemployment and any calendar year, either before or after treatment, for which earnings are used as an outcome or as a control variable. Furthermore, a higher frequency of the earnings data allows one to calculate measures of trend and variability of earnings as well as the mean or the median values.

The list of ideal regressors includes the following indicators, most of which are binary: i) single parent, ii) presence of young children, iii) the prior wage, iv) visible minority status, v) percentage of quarters with employment activity observed over a prior interval (obviously annual data do not suffice), vi) earnings at as high a frequency as possible, vii) a possible trend in earnings, viii) earnings variance about that trend, ix) the existence of an 'Ashenfelter dip' in earnings, x) the magnitude (in percentage terms) of a dip in earnings, xi) the degree of variability in prior earnings, xii) geographical region (rural versus urban), xiii) the country of origin, xiv) an accurate measure of time elapsed since school attendance (lacking in our study), xv) prior job experience (length of tenure or self-employment status), xvi) PT work, xvii) seasonal work, xviii) holding multiple jobs, xix) firm size, xx) industry of employer, and xxi) educational attainment (and was it obtained abroad?)

As far as the outcome variables are concerned, a consensus has emerged in the existing scientific literature that the variables are suitable: i) earnings – short term and longer term, ii) average hourly wage – short term and longer term, iii) average quarterly hours – short term and longer term, iv) employment status (binary indicator) – both short term and longer term, v) percentage of quarters (over an interval of fixed length) in the state of employment, vi) receipt of EI benefits (measured in terms of percentage of workers taking it up as well as dollar

amounts) – short term and longer term, vii) receipt of public assistance, percentage receiving and dollar amounts – short term and longer term, viii) participation in further adult education programming, and ix) participation in further training activity.

The time structure of the data matters as much the nature of the variables themselves. The data set needs to be structured such that the chronology of the events is observable and measurable to the researcher. For instance, when one returns to work, it is extremely useful to know exactly when that person transits to a certain state. A possibility would be a panel data structure for which the unit of observation is the person-quarter. In the case of the FWSP, given its relatively short duration, the data should have a monthly frequency.

Finally, we should like to state the importance of being able to observe and track the activity and outcomes of all members of the control group and of the treatment group for the *entire duration* of the intervention as well as during the (hopefully not short) follow-up period. Even if we have a reliable control group of workers, if the data set for the treatment group is characterized by very heavy attrition (e.g. one observes nothing after a participant has completed phase 1), the estimator of the treatment effect will be biased in an indeterminate fashion. Obtaining complete, uncensored information on program participation and subsequent outcomes would greatly improve the quality of the evaluation of programs such as the FWSP.

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Table 1
Descriptive Statistics for Entire Sample

| | Analyzed Sample | |
Variable	Mean	Std. Dev.
A. Gender		
Female	0.56	0.50
B. Age		
Age 15-24	0.10	0.31
Age 25-34	0.28	0.45
Age 35-44	0.31	0.46
Age 45-54	0.23	0.42
Age 55-64	0.07	0.25
Age 65 and above	0.00	0.05
C. Language & Nationality		
English	0.52	0.50
Immigrant	0.44	0.50
D. Educational Attainment		
Less than high School	0.21	0.40
High School	0.33	0.47
Some College	0.03	0.18
College Graduate	0.19	0.39
Some University	0.01	0.12
University Graduate	0.23	0.42
E. Test Scores		
Document-Use Score	232.8	44.5
Numeracy Score	267.9	47.2
Reading Score	257.5	47.5
F. Attrition		
Started Phase II	0.43	0.49
Started Phase III	0.30	0.46
Took 2nd TOWES	0.19	0.39
Observations	1,625	

Table 2
Descriptive Statistics for Perceived Barrier to Employment

Barrier	Proportion Answering 'Yes'
Language	0.13
Transportation	0.13
Educational	0.58
Learning Disability	0.06
Physical Disability	0.14
Drug/Alcohol	0.01
Legal Issues	0.02
Housing	0.04
Job Hunting Skills	0.14
Work Experience	0.43
Family Issues	0.04
Child Care	0.07
Observations	1,625

Table 3
Descriptive Statistics for Pre- and Post-Treatment TOWES Scores

	Document Use	Numeracy	Reading
Initial Scores			
A.1. Continuing Participants			
Mean	212.1	252.9	236.7
Standard Deviation	32.7	38.8	32.1
Top Quartile	237.0	279.0	257.0
Median	212.0	251.0	238.0
Bottom Quartile	189.0	227.0	218.0
Observations	314		
A.2. Non Continuing Participants			
Mean	237.8	271.4	262.5
Standard Deviation	45.5	48.4	49.3
Top Quartile	273.0	307.0	302.0
Median	243.0	275.0	270.0
Bottom Quartile	208.0	239.0	226.0
Observations	1,311		
B. Post-Treatment Scores			
Mean	235.3	270.5	254.9
Standard Deviation	33.8	39.3	36.2
Top Quartile	257.0	299.0	280.0
Median	236.0	272.0	255.0
Bottom Quartile	213.0	243.0	230.0
Observations	314		
C. Improvement			
Mean	23.1	17.6	18.2
Standard Deviation	28.5	35.3	29.2
Top Quartile	41.0	39.0	38.0
Median	24.0	14.0	19.0
Bottom Quartile	6.0	-1.0	1.0
Observations	314		

Table 4
Regression Results for TOWES Improvement and Finding a Job

Dependent Variable:	Found a Job		
	(1)	(2)	(3)
Average Initial TOWES	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)
Average Improvement	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)
Female		0.010	0.008
		(0.037)	(0.037)
Age 15-24		-0.076*	-0.054
		(0.040)	(0.038)
Age 25-34		-0.007	-0.001
		(0.041)	(0.041)
Age 45-54		0.070	0.079
		(0.050)	(0.049)
Age 55-64		0.078	0.089
		(0.096)	(0.095)
English		-0.005	0.029
		(0.050)	(0.049)
Immigrant		0.018	0.015
		(0.052)	(0.064)
Less than HS		0.040	-0.017
		(0.063)	(0.056)
Some College		0.041	-0.082
		(0.124)	(0.062)
College Graduates		0.014	-0.037
		(0.051)	(0.065)
Some University		-0.075*	-0.024
		(0.043)	(0.067)
University Graduates		0.007	0.142
		(0.047)	(0.126)
Imm.*Less than HS			0.236
			(0.194)
Imm.*Some College			0.167
			(0.170)
Imm.*College Graduates			0.085
			(0.090)
Imm.*Some University			-0.079
			(0.090)
Imm.*University Graduates			-0.142
			(0.131)
Constant	0.179	0.104	0.070
	(0.123)	(0.161)	(0.163)
Observations	314	314	314
R-squared	0.00	0.03	0.05

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5
Regression Results for TOWES Scores Improvement

Dependent Variables:	Domains		
	Document Use	Numeracy	Reading
Female	-0.131	-0.874	-0.957
	(3.367)	(3.887)	(3.734)
Age 15-24	15.067**	10.911	9.225
	(5.917)	(8.093)	(6.359)
Age 25-34	0.271	-5.556	-6.305
	(3.692)	(4.532)	(3.846)
Age 45-54	-0.268	-3.404	0.522
	(3.853)	(5.145)	(4.487)
Age 55-64	-9.946	-5.392	-3.536
	(6.446)	(6.099)	(5.974)
English	-4.238	-9.098	2.751
	(4.491)	(5.543)	(4.422)
Immigrant	-12.556**	5.878	-0.289
	(5.126)	(7.805)	(5.620)
Less than HS	-1.566	-7.699	-3.252
	(7.225)	(7.816)	(6.955)
Some College	19.285***	-4.499	52.481***
	(4.999)	(5.493)	(9.973)
College Graduates	-4.746	9.803	8.262
	(6.492)	(8.031)	(6.435)
Some University	22.717**	15.235	43.247***
	(11.294)	(10.654)	(13.711)
University Graduates	-3.759	18.274**	5.545
	(7.652)	(8.183)	(5.874)
Imm.*Less than HS	3.065	1.072	26.355*
	(11.848)	(15.615)	(14.974)
Imm.*Some College	-39.274***	-8.041	-46.734***
	(8.833)	(11.034)	(13.228)
Imm.*College Graduates	5.827	-26.825**	-5.693
	(8.626)	(10.580)	(8.843)
Imm.*Some University	-29.932**	-19.897	-59.362***
	(12.587)	(12.597)	(19.277)
Imm.*University Graduates	7.651	-26.802***	-6.953
	(8.558)	(10.018)	(7.419)
Initial Document Use Score	-0.582***	0.266***	0.256***
	(0.062)	(0.071)	(0.070)
Initial Numeracy Score	0.188***	-0.508***	0.086*
	(0.048)	(0.058)	(0.045)
Initial Reading Score	0.176***	0.031	-0.455***
	(0.060)	(0.076)	(0.063)
Constant	65.606***	87.975***	49.899***
	(13.371)	(17.451)	(15.093)
Observations	314	314	314
R-squared	0.29	0.3	0.23

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6
Regression Results for the Event of Second TOWES Participation

Dependent Variable:	Took 2nd TOWES			
	(1)	(2)	(3)	(4)
Female	0.087***	0.087***	0.078***	0.078***
	(0.019)	(0.019)	(0.019)	(0.019)
Age 15-24	-0.002	0.003	-0.004	-0.011
	(0.030)	(0.031)	(0.031)	(0.031)
Age 25-34	0.006	0.009	0.018	0.014
	(0.025)	(0.025)	(0.025)	(0.025)
Age 45-54	0.020	0.023	0.025	0.025
	(0.027)	(0.027)	(0.026)	(0.026)
Age 55-64	-0.005	0.001	0.003	0.002
	(0.037)	(0.037)	(0.036)	(0.037)
Age 65 and up	-0.177***	-0.201***	-0.229***	-0.237***
	(0.046)	(0.054)	(0.063)	(0.077)
English	-0.152***	-0.140***	-0.100***	-0.111***
	(0.026)	(0.027)	(0.027)	(0.027)
Immigrant	0.060**	0.048*	0.014	-0.006
	(0.027)	(0.027)	(0.027)	(0.040)
Less than HS		-0.022	-0.045*	-0.034
		(0.023)	(0.024)	(0.025)
Some College		-0.031	0.004	-0.047
		(0.049)	(0.047)	(0.042)
College Graduates		-0.023	-0.008	-0.005
		(0.027)	(0.027)	(0.031)
Some University		-0.001	0.011	0.020
		(0.080)	(0.081)	(0.092)
University Graduates		0.046	0.069**	-0.018
		(0.032)	(0.032)	(0.048)
Imm.*Less than HS				-0.106
				(0.068)
Imm.*Some College				0.146
				(0.112)
Imm.*College Graduates				-0.005
				(0.056)
Imm.*Some University				-0.021
				(0.175)
Imm.*University Graduates				0.111*
				(0.062)
Initial Document Use Score			-0.001***	-0.001***
			(0.000)	(0.000)
Initial Numeracy Score			0.000	0.000
			(0.000)	(0.000)
Initial Reading Score			-0.001	-0.001
			(0.000)	(0.000)
Constant	0.192***	0.189***	0.539***	0.567***
	(0.030)	(0.034)	(0.072)	(0.072)
Observations	1,625	1,625	1,625	1,625
R-squared	0.09	0.09	0.11	0.12

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7

Regression Results for Individual Phase Outcomes

Outcomes	Proportion
A. Phase 1 (n=1,625)	
Entered Phase 2	0.417
Found a Job	0.095
Returned to School	0.177
Incomplete	0.152
Other	0.159
B. Phase 2 (n=694)	
Entered Phase 3	0.637
Found a Job	0.063
Returned to School	0.102
Incomplete	0.112
Other	0.085
C. Phase 3 (n=482)	
Found a Job	0.133
Returned to School	0.448
Incomplete	0.162
Other	0.257
D. Final Outcome (n=1,625)	
Found a Job	0.162
Returned to School	0.352
Incomplete	0.245
Other	0.232

Table 8
Regression Results for Final Outcomes

Dependent Variables:	Outcomes		
	Found a Job	Returned to School	Incomplete
Female	-0.023	-0.001	0.004
	(0.019)	(0.025)	(0.022)
Age 15-24	0.012	0.087*	-0.059
	(0.032)	(0.045)	(0.041)
Age 25-34	0.040*	0.017	-0.017
	(0.024)	(0.031)	(0.028)
Age 45-54	0.055**	-0.051	-0.038
	(0.025)	(0.032)	(0.029)
Age 55-64	0.022	-0.043	-0.029
	(0.037)	(0.049)	(0.045)
Age 65 and above	0.370	-0.364***	0.013
	(0.243)	(0.070)	(0.231)
English	0.001	-0.095***	0.021
	(0.026)	(0.032)	(0.030)
Immigrant	-0.015	-0.102**	-0.003
	(0.036)	(0.047)	(0.043)
Less than HS	-0.011	-0.010	0.097***
	(0.028)	(0.039)	(0.037)
Some College	0.033	-0.081	0.007
	(0.067)	(0.082)	(0.076)
College Graduates	0.077**	-0.095**	-0.012
	(0.039)	(0.046)	(0.041)
Some University	-0.061	-0.028	0.158
	(0.076)	(0.131)	(0.134)
University Graduates	0.044	-0.149**	-0.012
	(0.051)	(0.062)	(0.057)
Imm.*Less than HS	0.090	-0.017	0.004
	(0.074)	(0.083)	(0.087)
Imm.*Some College	-0.014	-0.063	-0.017
	(0.110)	(0.135)	(0.127)
Imm.*College Graduates	-0.077	0.096	0.020
	(0.054)	(0.067)	(0.062)
Imm.*Some University	-0.015	0.199	-0.071
	(0.136)	(0.204)	(0.210)
Imm.*University Graduates	-0.009	0.203***	-0.065
	(0.060)	(0.075)	(0.068)
Initial Document Use Score	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Initial Numeracy Score	0.000	0.001	-0.000
	(0.000)	(0.000)	(0.000)
Initial Reading Score	-0.001**	0.001***	-0.001
	(0.000)	(0.000)	(0.000)
Constant	0.225***	0.114	0.433***
	(0.070)	(0.092)	(0.087)
Observations	1625	1625	1625
R-squared	0.02	0.03	0.03

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9
Regression Results for Phase 1 Outcomes

Dependent Variables:	Outcomes			
	Entered Phase 2	Found a Job	Returned to School	Incomplete
Female	0.119***	-0.041**	-0.043**	-0.011
	(0.025)	(0.016)	(0.020)	(0.019)
Age 15-24	-0.033	0.018	-0.001	-0.008
	(0.044)	(0.028)	(0.036)	(0.035)
Age 25-34	-0.011	0.031	0.014	-0.014
	(0.030)	(0.019)	(0.025)	(0.023)
Age 45-54	-0.002	0.015	-0.026	-0.010
	(0.032)	(0.020)	(0.025)	(0.024)
Age 55-64	0.006	-0.013	-0.037	-0.016
	(0.048)	(0.027)	(0.037)	(0.038)
Age 65 and above	0.011	-0.113***	-0.170**	0.166
	(0.219)	(0.037)	(0.068)	(0.209)
English	-0.100***	0.027	0.003	0.038
	(0.033)	(0.020)	(0.024)	(0.025)
Immigrant	-0.053	-0.024	-0.011	0.015
	(0.047)	(0.028)	(0.038)	(0.036)
Less than HS	0.035	-0.024	-0.038	0.034
	(0.037)	(0.025)	(0.033)	(0.031)
Some College	-0.073	0.001	0.021	0.015
	(0.069)	(0.059)	(0.078)	(0.068)
College Graduates	0.008	0.038	-0.089**	0.013
	(0.043)	(0.033)	(0.038)	(0.036)
Some University	0.063	-0.104***	0.049	0.078
	(0.135)	(0.019)	(0.121)	(0.120)
University Graduates	-0.047	-0.026	-0.098*	0.029
	(0.057)	(0.037)	(0.050)	(0.051)
Imm.*Less than HS	-0.080	0.045	0.032	0.071
	(0.091)	(0.054)	(0.064)	(0.078)
Imm.*Some College	0.295**	-0.023	-0.248***	-0.000
	(0.133)	(0.080)	(0.084)	(0.111)
Imm.*College Graduates	0.118*	-0.029	0.023	-0.009
	(0.068)	(0.044)	(0.052)	(0.053)
Imm.*Some University	0.076	0.150	0.010	-0.242*
	(0.207)	(0.108)	(0.175)	(0.126)
Imm.*University Graduates	0.201***	0.040	0.037	-0.092
	(0.072)	(0.044)	(0.059)	(0.058)
Initial Document Use Score	-0.001***	0.000	0.001*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Initial Numeracy Score	-0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Initial Reading Score	-0.001**	-0.000	0.001***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	1.000***	0.115**	-0.207***	0.133*
	(0.097)	(0.057)	(0.077)	(0.076)
Observations	1625	1625	1625	1625
R-squared	0.12	0.02	0.07	0.02

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10
Regression Results for Phase 2 Outcomes

Dependent Variables:	Outcomes			
	Entered Phase 3	Found a Job	Returned to School	Incomplete
Female	0.037	-0.003	-0.007	-0.028
	(0.040)	(0.018)	(0.026)	(0.028)
Age 15-24	-0.059	0.029	0.058	-0.049
	(0.072)	(0.037)	(0.052)	(0.049)
Age 25-34	0.058	0.019	-0.033	-0.011
	(0.047)	(0.025)	(0.029)	(0.031)
Age 45-54	0.023	0.020	-0.005	0.002
	(0.049)	(0.025)	(0.032)	(0.032)
Age 55-64	-0.017	-0.011	-0.009	0.013
	(0.077)	(0.033)	(0.050)	(0.057)
Age 65 and above	-0.725***	0.971***	-0.080	-0.071*
	(0.098)	(0.024)	(0.078)	(0.040)
English	-0.166***	0.004	-0.017	0.061*
	(0.048)	(0.028)	(0.032)	(0.034)
Immigrant	0.042	0.003	-0.047	0.010
	(0.071)	(0.028)	(0.048)	(0.054)
Less than HS	0.103	0.024	-0.038	-0.002
	(0.067)	(0.030)	(0.046)	(0.049)
Some College	-0.130	0.250	-0.149***	-0.152***
	(0.203)	(0.172)	(0.038)	(0.039)
College Graduates	0.072	0.112**	-0.073	-0.053
	(0.079)	(0.049)	(0.051)	(0.053)
Some University	-0.168	0.160	-0.164***	0.044
	(0.168)	(0.181)	(0.044)	(0.186)
University Graduates	0.030	0.090	-0.108*	-0.111***
	(0.104)	(0.065)	(0.056)	(0.042)
Imm.*Less than HS	-0.423***	0.110	0.090	0.011
	(0.139)	(0.087)	(0.088)	(0.100)
Imm.*Some College	0.043	-0.189	0.153	0.109
	(0.253)	(0.194)	(0.099)	(0.108)
Imm.*College Graduates	-0.227**	-0.072	0.105	0.043
	(0.106)	(0.058)	(0.068)	(0.074)
Imm.*Some University	-0.024	-0.184	0.103*	0.226
	(0.292)	(0.181)	(0.054)	(0.289)
Imm.*University Graduates	-0.047	-0.061	0.116*	0.045
	(0.119)	(0.071)	(0.067)	(0.058)
Initial Document Use Score	-0.001	0.000	-0.000	0.001
	(0.001)	(0.000)	(0.000)	(0.000)
Initial Numeracy Score	0.000	0.000	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Initial Reading Score	-0.001*	-0.000	0.001***	-0.001
	(0.001)	(0.000)	(0.000)	(0.000)
Constant	1.174***	-0.046	-0.256**	0.163
	(0.162)	(0.088)	(0.105)	(0.118)
Observations	694	694	694	694
R-squared	0.09	0.08	0.05	0.04

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11
Regression Results for Phase 3 Outcomes

Dependent Variables:	Outcomes		
	Found a Job	Returned to School	Incomplete
Female	-0.004	-0.001	-0.010
	(0.035)	(0.052)	(0.036)
Age 15-24	-0.060	0.267***	-0.129*
	(0.046)	(0.090)	(0.066)
Age 25-34	-0.004	0.039	-0.021
	(0.037)	(0.062)	(0.046)
Age 45-54	0.111**	-0.095	-0.118***
	(0.046)	(0.063)	(0.041)
Age 55-64	0.113	-0.037	-0.112*
	(0.079)	(0.097)	(0.064)
English	0.011	-0.078	-0.059
	(0.049)	(0.065)	(0.041)
Immigrant	0.076	-0.181**	-0.040
	(0.066)	(0.089)	(0.061)
Less than HS	-0.012	-0.021	0.208***
	(0.047)	(0.081)	(0.067)
Some College	-0.144***	-0.098	0.544*
	(0.053)	(0.241)	(0.318)
College Graduates	0.001	0.042	-0.051
	(0.076)	(0.107)	(0.066)
Some University	-0.113*	-0.043	0.296
	(0.062)	(0.369)	(0.381)
University Graduates	0.118	-0.074	0.049
	(0.102)	(0.123)	(0.097)
Imm.*Less than HS	0.108	0.088	-0.193
	(0.154)	(0.189)	(0.138)
Imm.*Some College	0.102	0.202	-0.668**
	(0.157)	(0.325)	(0.322)
Imm.*College Graduates	-0.092	0.072	0.019
	(0.097)	(0.140)	(0.090)
Imm.*Some University	-0.078	0.407	-0.116
	(0.081)	(0.469)	(0.464)
Imm.*University Graduates	-0.165	0.210	-0.090
	(0.111)	(0.142)	(0.109)
Initial Document Use Score	0.001	-0.000	0.001
	(0.001)	(0.001)	(0.001)
Initial Numeracy Score	0.001	0.001	-0.001***
	(0.000)	(0.001)	(0.000)
Initial Reading Score	-0.001*	0.001	0.000
	(0.001)	(0.001)	(0.001)
Constant	0.078	0.228	0.343**
	(0.142)	(0.209)	(0.145)
Observations	482	482	482
R-squared	0.05	0.05	0.11

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1