Higher Education Quality Council of Ontario

An agency of the Government of Ontario

Education and Labour Market Impacts of the Future to Discover Project: Summary of Key Findings

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Published by

The Higher Education Quality Council of Ontario

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Cite this publication in the following format:

Hui, T. S. and Ford, R. (2018). *Education and Labour Market Impacts of the Future to Discover Project: Summary of Key Findings*. Toronto: Higher Education Quality Council of Ontario.

Introduction

Finding ways for young people to achieve their full potential is a universally shared political objective, whether the ultimate goal is economic growth, innovation and competiveness, or promoting social inclusion and reducing social and health inequalities. Many from disadvantaged groups will need to pursue postsecondary education (apprenticeship, college or university) to thrive in the global knowledge economy. Yet many face barriers in their career pathway including access to postsecondary education (PSE).

The Future to Discover project began in 2003 with the realization that to increase PSE access among underrepresented groups, attention needed to focus on the reduction of multiple barriers. Lack of financial resources, poor academic preparation, poor information and lack of interest in further education can all hold a student back, with many facing two or three of these barriers at the same time. With a scientifically rigorous design, the project was established to test interventions intended to overcome limitations posed by lack of financial resources or lack of information about the available pathways through PSE and their costs and benefits.

The brainchild of the now-defunct Canada Millennium Scholarship Foundation, Future to Discover was implemented by the Social Research Demonstration Corporation (SRDC) as a social experiment. More than 5,400 student volunteers in two provinces were randomly assigned to one of four groups and received either one of two carefully designed interventions, both at the same time or no new service as part of a control group. With such a rigorous design, over time it has become possible to report whether or not such interventions make a genuine difference in young people's lives and whether it would be financially viable for governments to adopt such programs at scale. While the project was conducted in Manitoba and New Brunswick, the findings have implications for all provinces including Ontario.

SRDC tracked the outcomes of two cohorts of young people involved in Future to Discover from Grade 9 through to their mid-20s. This report summarizes what has been learned about the impact of the interventions on their lives, especially the new education and labour market pathways they have chosen as a result of the interventions. It includes best estimates — derived for the first time from an experiment — of the impact on their predicted lifetime incomes when the barriers to PSE they faced have been removed. It provides a first, cautious answer to one of the most critical questions asked by decision makers concerned with PSE access programming: "How much of a difference will PSE make to the lives of youth who will not go if we do not intervene?" Positive results support the idea that when early interventions genuinely increase PSE access they can have longer-term labour market benefits, beyond the increase in educational attainment.

SRDC has been a central part of this ambitious undertaking since 2003 and its team is very grateful to the Higher Education Quality Council of Ontario for this opportunity, provided since the demise of the foundation, to produce a summary of results across both provinces and to share them with policy makers and practitioners in Ontario and elsewhere. This report summarizes the project's design and implementation, the impacts of its interventions on rates of student participation in and completion of PSE,

as well as on their incomes. It includes a review of important insights gained and how they might be applied to new policy and programming. A companion technical report is also available (Ford & Hui, 2018a) providing a more detailed compilation and explanation of methods and results for policy analysts and researchers.

What is Future to Discover?

Future to Discover (FTD) is a pilot project involving a sample of 5,429 Grade 9 students originally drawn from 51 high schools in Manitoba and New Brunswick. It tests the effectiveness of two interventions designed to help students overcome barriers to PSE, namely lack of career clarity, misinformation about PSE and lack of financial resources. This report presents the impacts on PSE and labour market experiences of offering the interventions to youth.

The two interventions were:

- Explore Your Horizons (EYH), which offered students enhanced career planning and better information about the costs and benefits of postsecondary programs from early on in their high school years. It equally encouraged pursuit of programs in apprenticeship, private vocational institutes, community college and university. It was implemented between 2004 and 2008 while project participants were still in high school.

- Learning Accounts (LA), which promised during the early years of high school up to $8,000 of non-repayable financial aid to students from lower-income families should they go on to pursue PSE. Deposits into the accounts accumulated between 2004 and 2008 while project participants were still in high school. Payments to participants who made the transition to postsecondary studies were made between 2007 and 2011. Manitoba did not participate in LA.

The FTD project set out to test whether these interventions, offered either separately or in combination (EYH+LA), would increase high school students' chances of enrolling in PSE. While various programs offer information and financial assistance relating to PSE, FTD is distinct in its relatively early promise of assistance and in its design targeting those who are traditionally least likely to attend PSE.

Intervention Design

EYH was designed to facilitate participants' development of their own postsecondary plans based on their passions and interests. It engaged parents as allies and existing postsecondary students as role models. The program provided enhanced career education through voluntary, after-school sessions beginning in Grade 10.

EYH participants were invited to take part in 40 hours of after-school project activities over a three-year period (Table 1). These activities provided enhanced career education and focused information on postsecondary studies intended to go beyond what was otherwise available in Manitoba and New Brunswick high schools. The package of sequentially and developmentally appropriate material was designed by leading experts, including researchers and practitioners, in the field of career development. The information was delivered through workshops facilitated by project staff, including guidance counsellors or educators and postsecondary students serving as role models. A project magazine and a website were also available to students in order to reinforce workshop content alongside focused information on PSE. The EYH curriculum as a whole was designed to permit other jurisdictions to integrate the materials with their own.

EYH activities attempted to help students make sense of the range of occupational and postsecondary choices and estimate the benefits and costs of each. The intent was to help overcome any informational or motivational barriers to higher education that under-informed or misinformed students might have so that they might make meaningful decisions about their futures. The intervention involved an exploration of all postsecondary paths — apprenticeships and vocational training as well as college and university. A full description of EYH Year 1 activities may be found in the FTD *Early Implementation Report* (SRDC, 2007, Chapter 5).

Table 1: Explore Your Horizons Components

Component	Rationale	Frequency in Grade 10	Frequency in Grade 11	Frequency in Grade 12
Career Focusing	To help high school students explore career and education options and develop suitable career education plans. Parents are invited to the final session.	6 workshops of 2 hours (12 hours).		
Lasting Gifts	To help parents understand career development and how to support their children through the process. Parents and children are invited to attend all sessions together.		4 workshops of 2 hours (8 hours)	
Future in Focus	To help students manage transitions and build resilience to overcome challenges, such as through support networks. Parents are invited to the final session.			4 workshops of 2 hours (8 hours) plus orientation session
Postsecondary Ambassadors	To promote career exploration and education planning by establishing connections between high school students and students currently enrolled in a range of postsecondary education and training programs.	2 workshops of 2 hours (4 hours)	2 workshops of 2 hours (4 hours)	2 workshops of 2 hours (4 hours)

Future to Discover Website	To provide information about career and education planning to encourage education and training after high school. Profiles, articles, and quizzes are presented in a colourful format designed to be appealing to youth.	Accessible throughout Explore Your Horizons. Participants gain graduated access to more site information over the three-year period.		
***F2D* Magazine**	Same as for the Future to Discover Website above.	2 issues	2 issues	2 issues

LA promised PSE funding to students in New Brunswick high schools with a family income at or below the provincial median. The funding commitment was made as they entered Grade 10, long before they can apply for regular student financial-assistance programs, and at a time when it might more effectively influence their decisions about whether to continue their studies past high school and their course choices and levels of effort during high school. Unlike other programs that make early commitments of aid, access to LA was not conditional on students' educational achievement in high school.

The early promise was a bursary of up to $8,000 for participation in a full-time postsecondary program. Students were told that by attending a New Brunswick high school and successfully completing each consecutive school year until graduation and by successfully enrolling in a PSE program (recognized by the Canada Student Loans Program) they would receive up to $4,000 in each of two years of postsecondary study.

At the end of both Grade 10 and Grade 11, participants in LA received statements noting deposits in their accounts of $2,000 for each year successfully completed. LA participants had another instalment of $4,000 deposited into their accounts upon graduation from a New Brunswick high school. The accumulation of funds over time was intended to recognize each participant's continued commitment to education and to encourage reflections on life after high school. Eligibility for the LA intervention was determined using data from income tax returns provided by their parents.

Those lower-income students who received the offer of a Learning Account may have realized earlier than they otherwise would have that pursuing PSE can be an affordable and realistic option. In turn, this may have led them to undertake better planning for the future. Alternatively, or in addition, the accumulated funds could help students overcome financial barriers by reducing the costs associated with PSE.

Evaluation to Date

Recruitment for FTD took place in 2004 and 2005 when the participants were in Grade 9. Two cohorts were recruited in New Brunswick (in spring 2004 and spring 2005), as well as a single cohort in Manitoba (in spring 2005). The 5,429 participants who consented to take part were randomly assigned to one of three experimental groups or to a comparison group receiving no new intervention. The project thus involved four groups, as follows:

- EYH participants who were offered access to the after-school guidance workshops
- LA participants who were promised funding for postsecondary studies
- Participants who were offered access to both EYH workshops and LA funding
- A comparison group of participants who were offered neither intervention

By randomly assigning students into groups whose outcomes would be compared over time, SRDC ensured each program group was initially (at "baseline" when recruited at the end of Grade 9) very similar to the control group. The influence of remaining chance differences observed in the baseline data were controlled for by a statistical procedure called a regression adjustment. As a result, differences in program- and comparison-group outcomes can be reliably attributed to the offer of the intervention and are thus termed impacts.

While the evaluation has been primarily concerned with how well the interventions improved PSE participation, earlier reports have considered a wide range of intermediate outcomes.

Information about the early implementation of EYH and LA, including design, school selection and baseline characteristics of project participants, can be found in the *Early Implementation Report* (SRDC, 2007). The analysis found that recruitment and random assignment for the project were successful. The demographic and socioeconomic characteristics of the students recruited for FTD were statistically identical across the four groups to be compared in the analysis.

SRDC has concluded from its implementation research that EYH and LA were successfully delivered. Both received a "fair test" in the sense that they were delivered as intended. However, participation in the interventions among those assigned to the program groups was nonetheless disappointing.

In Manitoba:

- 76% of those assigned to the program group attended at least one workshop
- 48% attended six or more workshops
- Attendance reached its peak at 66% of program group members

In New Brunswick:

- 84% of both anglophone and francophone program group members attended at least one workshop
- 60% and 61%, respectively, attended six or more workshops
- Attendance reached its peak at 73% and 71% of program group members, respectively

Most assigned to the program group attended at least one EYH workshop and many attended multiple workshops. Attendance declined over time, typically reaching its lowest level in Grade 11, when the Lasting Gifts component, offered jointly to participants and parents/guardians or a significant adult, was offered during evening sessions.

Given the design of EYH as an after-school intervention, it is unlikely that more could have been done to increase participation. Many students have other commitments after the school day is over. When asked in the Grade 12 survey why they had not attended EYH sessions more often, the reasons given reflected the fact that sessions were held outside of school time:

- 27% of respondents cited scheduling conflicts with work
- 14% cited conflicts with sports
- 13% indicated more generally that the timing of the sessions was not good

Arguably, if the content of the EYH sessions had been delivered during mandatory class time, more members of the program group would have been exposed to key messages and the impacts of EYH would have been higher than those found by the project.

LA had a high sign-up rate: By the end of Grade 10, 93% of participants had signed their participant declaration (which made clear the program requirements) and were meeting the high school attendance requirements necessary to receive their first $2,000 instalment. Following their notification of assignment and declaration, each student subsequently received annual statements informing them of the amount accumulated in their Learning Account. Otherwise, the amount of contact between LA participants and the FTD office was limited. Perhaps as a result, the existence of the account was not top of mind for many program-group members by Grade 12. When FTD participants responded to the Grade 12 survey, LA program-group members reported low awareness of actually having a Learning Account. Awareness was lower for the anglophone sector (38.6%) than for the francophone sector (58.4%). Among those LA participants who reported that they had a Learning Account, the total amount of $8,000 was recalled by the majority both of francophone (83.8%) and anglophone participants (77.3%). Calls from the FTD office reminding LA holders of their status, which took place after the survey was completed, may have altered account holders' levels of awareness of their accounts in advance of commencing postsecondary education.

Earlier Reported Impacts

Ford et al. (2012) reported impacts observed 5 ½ years after the participants were randomly assigned at the end of Grade 9, when participants were about halfway through their third postsecondary year (assuming conventional progression through education, without gap years). For each subsequent postsecondary year (four through seven), SRDC has updated results for New Brunswick students (see, for example, Ford, Hui, & Kwakye, 2018).

These reports all found that both EYH and LA increased demand for education. Depending on the subgroup and provincial/population setting, the programs increased high school graduation or postsecondary enrolment or both. These results were seen for many subgroups with lower access rates such as males and those from lower-income (LI) and first-generation families (FGF) where neither parent attended PSE, making the programs of interest to policy makers seeking increased access for these groups.

A group with traditionally low rates of PSE participation of particular interest to the project was dubbed "LILE" (for lower-income, lower-educated families where parent(s) reported below-median income and no credential from two or more years of PSE). All three permutations of the intervention increased combined university and college enrolment by 10 to 11 percentage points for the New Brunswick LILE group relative to the equivalent control group, a result driven largely by the impacts on francophone student enrolments. However, the 9.4 percentage point impact for EYH in Manitoba was not statistically significant.

The 2012 report included a cost-benefit analysis that concluded LA was very cost effective due to a relatively low administrative cost and the targeting of lower-income students. It generated a benefit of $2 to $3.40 for each dollar spent by government. Although LA and EYH cost governments roughly the same to operate, LA used fewer resources since most of its expenditures were transfers from the government to the participants and some of these would have been made in any case in the form of student financial aid (loans that LA offset). Combining EYH with LA did not increase the net social benefit. However, the combined EYH+LA program was still economically viable. It generated a benefit of $1.51–$1.75 for each dollar it cost the government.

The earlier reports concluded that both interventions had considerable potential to positively affect high school students' educational trajectories, while each intervention potentially attracted them to different types of PSE. The authors also urged caution in interpreting the findings for different populations and policy environments, given the differences between provinces and linguistic sectors in the findings.

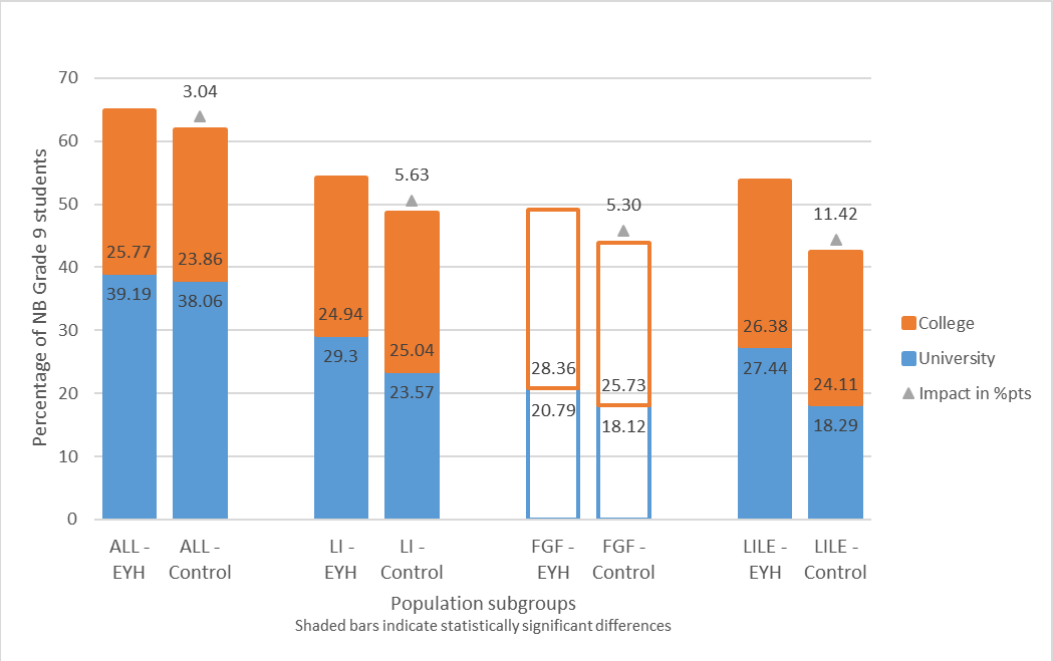
Longer-term Impacts on Education

FTD's interventions were intended to transform the lives of high school students by allowing new groups to experience PSE, setting them on a new trajectory and creating lasting change. Arguably, the differences seen in the earlier reported findings should build over time. This report considers the differences in education outcomes and economic circumstances 10 years after Grade 9. For both provinces, data is drawn from linked tax records that give almost complete coverage for all participants of annual income sources and some educational credits that can be considered measures of PSE outcomes. For New Brunswick, SRDC also has linked data from New Brunswick Community College, Collège communautaire du Nouveau-Brunswick (CCNB), New Brunswick College of Craft and Design and the Maritime Provinces Higher Education Commission. The latter includes information on participants' public university enrolment in any of the Maritime provinces.

The impacts on education outcomes are presented in bar charts featuring three or four groups. Since LA was only available to students whose parental income fell below the provincial median, all results for LA and EYH+LA are presented only for lower-income families, labelled "LI." EYH was offered to a cross-section of students from all income groups and these results are included labelled as "ALL." The bar charts feature impacts for FGF and LILE groups also (see "Key Definitions in Figures" below).

The impacts of EYH on postsecondary enrolment in New Brunswick are shown in Figure 1.

Figure 1: Ten-year Impacts of EYH on University and College Participation (New Brunswick)

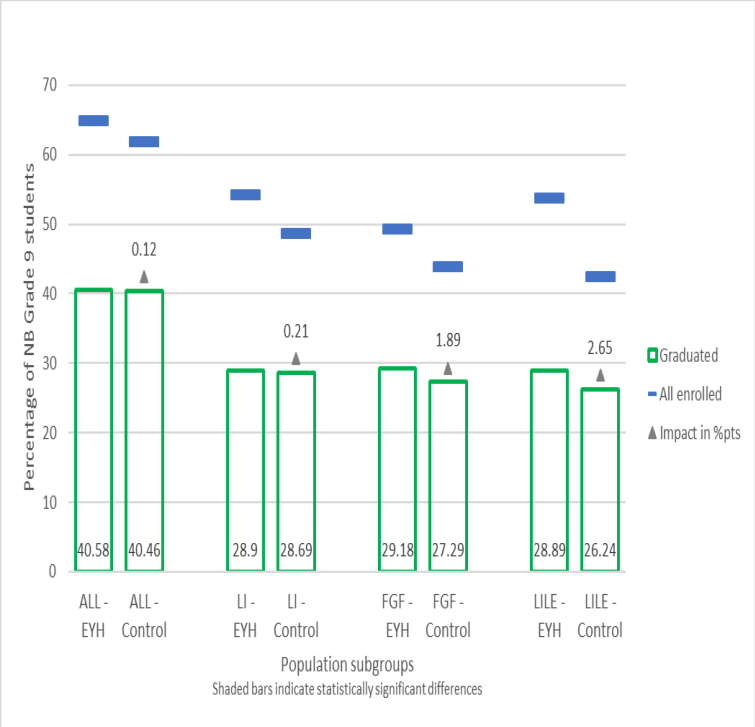


For each of the four groups (from left to right: all students, students from LI families, from FGF and from LILE families) the postsecondary outcomes 10 years following random assignment are given in pairs. The program-group members' outcomes are shown in the first column of each pair and the control group in the second. The university enrolment rate is shown in blue and the college enrolment rate (without any university attendance) is shown in orange. Total PSE enrolment is thus represented by the combined column: nearly 62% for the control group representing all students in Figure 1. Since the program-group enrolment is almost 65%, the impact of offering EYH can be interpreted as the difference between the two columns, or 3 percentage points. The precise estimate is shown above the triangle on top of the control group column. This difference is statistically significant — we are confident at least nine times out of every 10 that we get this result and that it is not arising by chance. Solid bars signify statistical significance. Empty bars — as seen for the FGF group — are shown for results where we have insufficient confidence to rule out that the result occurred by chance.

Figure 1 indicates that EYH was successful in increasing PSE enrolment for LI students, especially those from LILE families, where the impact of offering the career education was 11 percentage points. Furthermore, variations in the blue bars suggest that for lower-income families, EYH primarily worked to increase university enrolment, which was about 9 percentage points higher. Given that only 18% of this group attend university without intervention, the rate of university enrolment is 50% higher for this subgroup when offered EYH.

The impact of EYH on the completion of PSE is considered in Figure 2.

Figure 2: Ten-year Impacts of EYH on University and College Graduation (New Brunswick)



The columns denote the same groups as in Figure 1. For reference, the enrolment rates from Figure 1 are included as blue lines. Overall, the impacts are less encouraging. Only around two out of every three students enrolled in PSE gain a credential from their PSE studies and the impact of EYH on this outcome is minimal. Even for the LILE groups where offering EYH increased enrolment dramatically, the difference in credentials earned is not statistically significant.

Unfortunately, 10-year PSE enrolment or graduation data for Manitoba is not available. For reference, Figure 3 reproduces the impact of EYH for Manitoba students at the 5 ½ year point previously reported in Ford et al. (2012).

Key Definitions in Figures

EYH signifies the program group in which all members were offered a seat in EYH classes for three years. Not all of the program group subsequently attended EYH (meaning outcomes for many in the program group were unlikely to be affected by EYH). The outcomes across all those *offered* the intervention are included. This is to maintain comparability between membership of the program group and that of the control group, since outcomes across all of the latter group are also included.

LA signifies the program group in which all members were offered an $8,000 Learning Account in Grade 9. Not all of the program group subsequently claimed the grant (meaning outcomes for many in the program group were unlikely to be affected by LA). The outcomes across all those *offered* the intervention are included. This is to maintain comparability between membership of the program group and that of the control group.

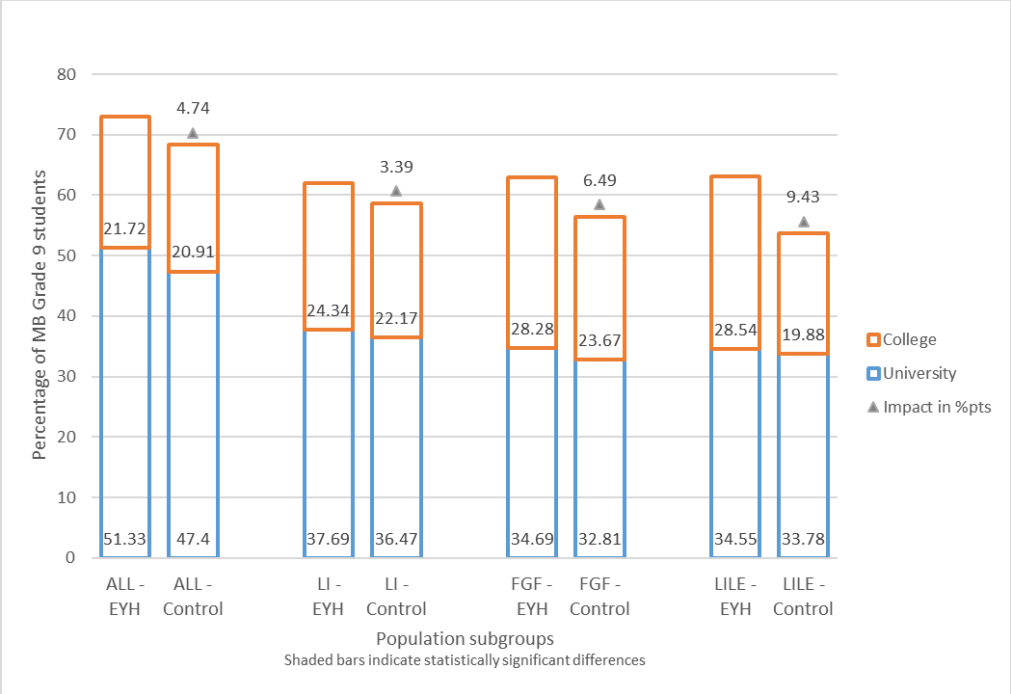
EYH+LA signifies the program group in which all members were offered both a seat in EYH classes for three years and an $8,000 Learning Account in Grade 9.

LI (lower-income) signifies that the participant lived in a family whose income fell below a threshold set at the provincial median for a family of its size.

LILE (lower-income lower-education) signifies the participant lived in a LI family where neither parent had completed two or more years of PSE.

FGF (first-generation families) signifies the participant lived in a family where neither parent had ever attended PSE.

Figure 3: Impacts of EYH on University and College Participation after 5 ½ Years (Manitoba)

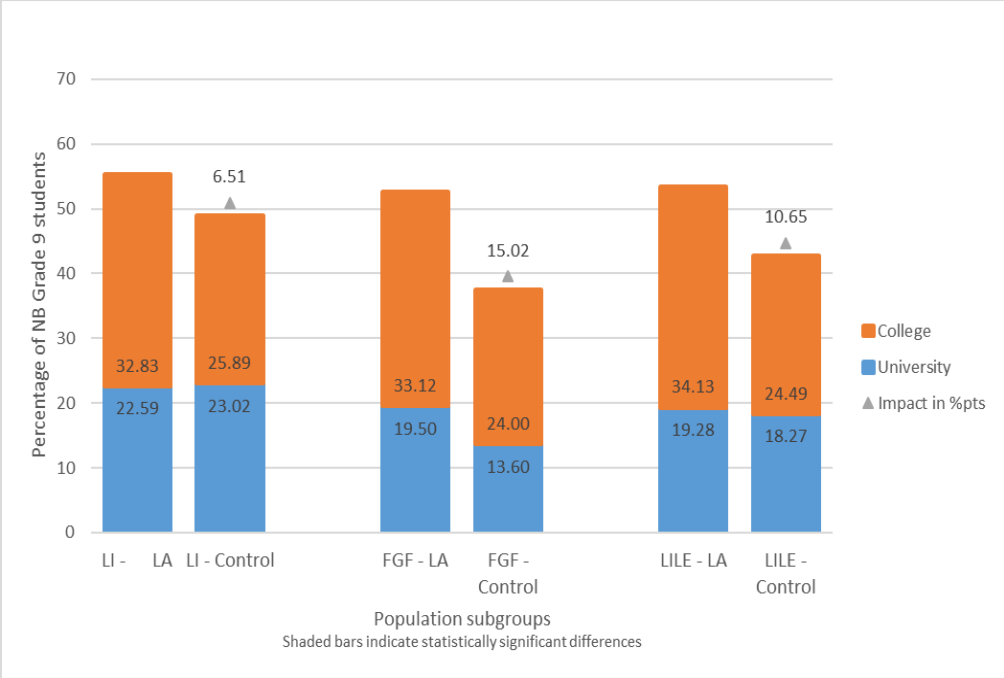


Unlike in New Brunswick, there were no significant impacts of offering EYH on PSE enrolment in Manitoba. There are several possible explanations for this. Among these, some of the most convincing include the introduction of new career-education programming to secondary schools in Manitoba at about the same time as the trial of EYH that may have meant control-group members received some of the same messaging in regular class time as (some) program-group members were receiving in EYH in both provinces. Plausibly, the rate of PSE enrolment was already higher in Manitoba after 5 ½ years than equivalent New Brunswick students achieved after 10 years, meaning there may have been fewer students on the margins of going to PSE in Manitoba for EYH to motivate. Finally, but perhaps most importantly, the experiment may have been "underpowered" in Manitoba to detect impacts on the scale EYH was likely to produce. When the project was designed (SRDC, 2007), target sample sizes were set to permit the detection of impacts of 9.1 percentage points or larger per education system.

Underpowering the trial of EYH in Manitoba would mean it had too few sample members to detect impacts below 9.1 percentage points. At just over 1,000 students, the Manitoba sample involved in these comparisons is about half the size of New Brunswick's because the New Brunswick sample includes two education systems — the separately-operated francophone and anglophone education sectors. Comparing the two provinces' results in Figures 1 and 3 suggests the magnitude of the overall impacts were similar across both provinces. Yet, significant impacts were found only in New Brunswick.

PSE outcomes from other FTD interventions tested only in New Brunswick that included LA also generated positive impacts, as seen in Figures 4 through 7. Because accounts were offered only to lower-income families, results for "all" students are not available in these charts.

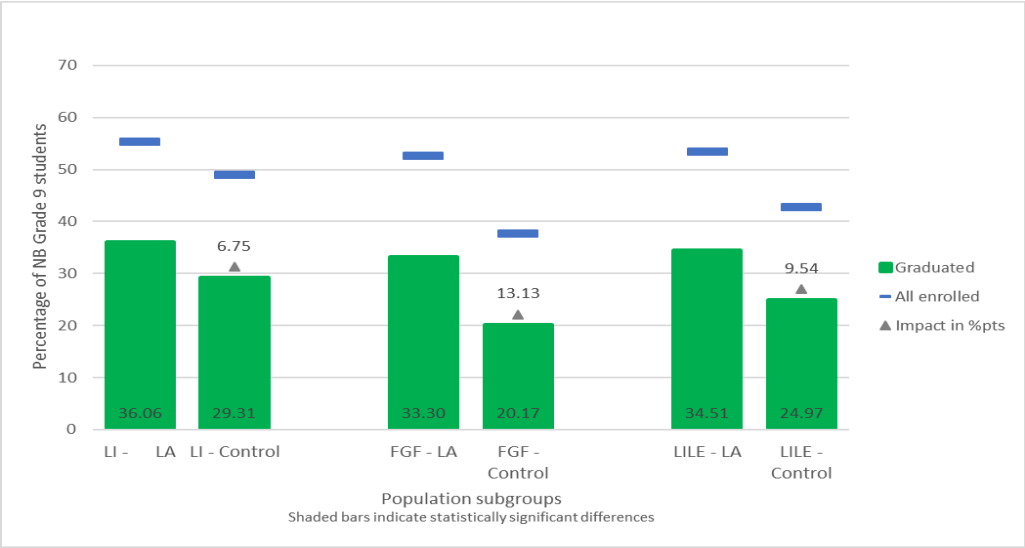
Figure 4: Ten-year Impacts of LA on University and College Participation (New Brunswick)



Ten years after the offer of LA in Grade 9, the impact of LA on PSE enrolment was statistically significant for all groups, ranging from 7 percentage points for all students from LI families to 15 percentage points for those from FGF (Figure 4). This latter result represents an increase of close to 40% in PSE participation for students from these families. In contrast to EYH, the increase was largely seen in college enrolment. Figure 5 shows that, again unlike EYH, LA significantly increased graduation from PSE and by a similar order of magnitude to its impact on enrolment. Unlike EYH, therefore, LA not only got more high school students to start PSE, it got them to complete it as well.

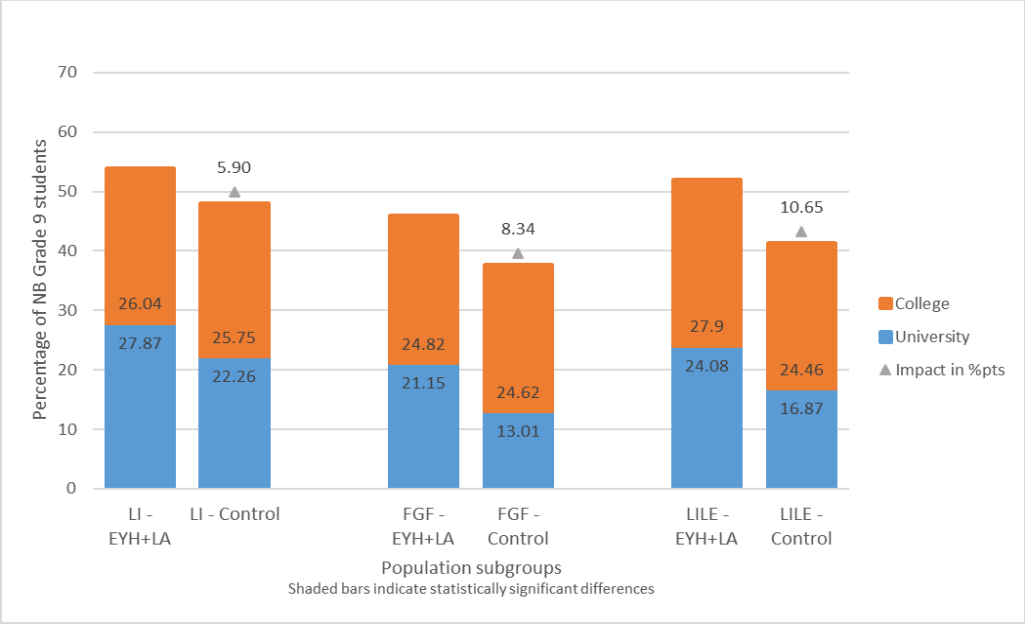
Although not shown, the impacts of LA on graduation rates were due to many more students earning community college credentials. LA had no statistically significant effect on university graduation rates. The pattern of results from offering New Brunswick students EYH+LA was, superficially at least, very similar to the impact of offering LA on its own. Figure 6 depicts impacts on PSE enrolment ranging from 6 to 11 percentage points.

Figure 5: Ten-year Impacts of LA on University and College Graduation (New Brunswick)



However, careful comparison of Figures 4 and 6 reveals that the enrolment impact from EYH+LA is seen more on university enrolment than college enrolment. While this is similar to EYH, the impact of EYH+LA on FGF students is statistically significant and produces a large magnitude (63%) increase in the rate at which such students attend university.

Figure 6: Ten-year Impacts of EYH+LA on University and College Participation (New Brunswick)

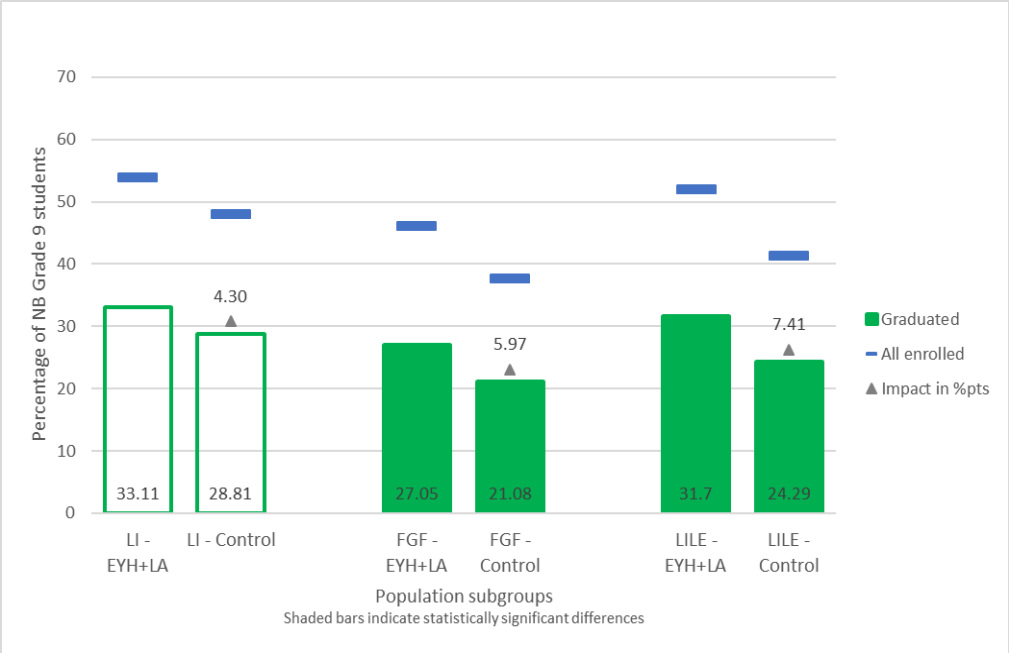


Interestingly, the magnitude of the impact of EYH+LA on combined PSE enrolment is no greater than from offering EYH or LA separately. This may be because there is a limit to the size of the group of marginal students that such programs can reach. The program groups' PSE participation rate of 55% may thus represent an upper bound rate for what career education or early-promise grants can achieve, at least given the level of take-up by New Brunswick lower-income families. Motivating even more students to access PSE may require higher levels of participation in program activities or very different interventions that tackle different barriers (because the pool of non-PSE attendees who can be influenced to go by early-promise grants and enhanced career education has been exhausted). For example, early-promise grants and career education may not tackle barriers that are academic in nature. SRDC reports elsewhere on a similar 10-year trial of an academically focused program called Advancement Via Individual Determination, or AVID, in British Columbia (Ford & Hui, 2018b). What is clear from Figures 2, 4 and 6 is that different interventions motivate different PSE choices. For New Brunswick students, the additional career education from EYH motivated many more to try university, even when combined with LA. Conversely, without the career education, LA induced more community college enrolment but not university enrolment.

The graduation impacts of EYH+LA in Figure 7 indicate a similar pattern of results to LA alone, albeit somewhat reduced in magnitude (and not statistically significant when all lower-income families are considered as a group). In fact, EYH+LA produced statistically significant impacts on college graduation for all groups shown, yet no impacts on university graduation (not shown). This is surprising because enrolment impacts were concentrated in university. There was no impact on college enrolment overall yet graduation impacts were concentrated in college. There are two plausible explanations. EYH+LA either (a) increased the completion rate of students who would have gone to college anyway, or (b) induced two effects simultaneously such that some students who would have gone to college took up university instead (while not completing) and other students who would not have attended PSE at all went to college and attained a credential.

If explanation (a) is true, then in Figure 5, LA alone may have had a similar effect, improving college graduation among those who would have attended anyway but not completed. Although LA increased college enrolment and graduation by roughly the same amounts, the impacts on behaviour may have been spread across a larger group of students than just those new to PSE. Explanation (b) is more consistent with the pattern of impacts seen for EYH alone and the notion that it is marginal students newly attending PSE due to LA who account for the increase in college graduation.

Figure 7: Ten-year Impacts of EYH+LA on University and College Graduation (New Brunswick)



To summarize the education results in New Brunswick:

- FTD interventions — either of enhanced career education in EYH or an early-promise grant in LA, or both — increased PSE participation by encouraging high school students who would not otherwise have enrolled in PSE to do so.

- LA encouraged community college enrolment and completion whereas EYH encouraged university enrolment but produced no evidence of impact on university graduation by the 10-year mark (equivalent to the seventh possible postsecondary year for most participants).

- The effect of combining the interventions reflected the dominant patterns seen when they were offered alone. EYH+LA increased university enrolment and college graduation.

With any of the three permutations, lower-income New Brunswick students were spending considerably longer in PSE than they would have otherwise. Furthermore, it was also apparent that FTD produced no conclusive long-term positive impact on PSE participation for Manitoba students, where program group members were only offered the EYH intervention and tracked for less time.

The education findings are cumulative. Although the data records PSE over 10 years, most of the education impacts were already evident after seven or eight years. This raises an obvious question: “What happened

next to these students?" Was offering high school students PSE access interventions of any consequence for the rest of their lives? Did changing their education decisions change their economic trajectories? The final stage of SRDC's evaluation thus examines employment and earnings outcomes.

Impacts on Employment and Earnings

For many economists, assessing the impact of educational interventions on the economic outcomes of young people — often dubbed the *returns to education* — represents the Holy Grail of education policy research. Many policy and program funding decisions (not to mention individual life choices) are made on the assumption that substantial returns exist. Yet, it is almost impossible to estimate returns accurately. There are two major reasons why. First, the lifetime of income earned by a consumer of education in the past cannot be observed (and is very hard to forecast with confidence) within a timeframe that retains any relevance to planning or decisions related to a contemporary education experience. And second, even if the returns could be estimated with confidence, attributing changes in income to the education itself is challenging. Many other competing explanations — such as the individual's existing characteristics, circumstances or other interventions (such as raises in the minimum wage, for example) — arise to explain gains in income. Longitudinal experimental studies like FTD provide rare opportunities to overcome these constraints and get closer to the Holy Grail, even though any estimate they produce will carry several caveats.

An experimental design whereby education is "randomly assigned" to participants aids attribution greatly. This is because existing characteristics, circumstances and other interventions affecting education outcomes are controlled for: The control-group members on average receive the same mix as the program group, with the sole exception of the intervention of interest (in this case, education). The difference in outcomes between program and control groups in a well-run experiment would thus provide an unbiased estimate of the impact of additional education. Experiments where an intervention works largely to increase consumption of education can provide estimates of the returns to education for the marginal student. This applies to the extent that economic outcomes can be attributed to the additional education the intervention induces, rather than economic outcomes being a direct outcome of the intervention.

This leads to one of the two important caveats in experimental estimates. Education itself is hard to randomly assign. Results in the previous section have shown that many control group members attend PSE without FTD. All FTD has done is assign interventions that increase the proportion attending (and completing) PSE. Later in this section we consider ways to attribute the economic impact of this *additional* PSE to the people who most plausibly might have benefited from it. But this yields the second related caveat, which is that the intervention itself cannot be ignored. The program groups received an access intervention as well as the additional education it induced. While the designers of FTD were tasked to develop career education and grant programs that would increase PSE access, the effect of the interventions may not have stopped at increasing PSE enrolment. Both types of program may have changed the choices of program of group members who would have gone to PSE anyway.

There is already some evidence that FTD interventions induced differences in program-group members' choices of types of PSE relative to their counterparts in the control group. Ford, Hui, and Kwakye (2018) report that LA altered some students' financial decisions around whether and how much to borrow to fund PSE. Thus, some of the changes in economic fortunes may result from changes induced by the tested programs directly rather than from the education per se. While this must be kept in mind when reviewing the estimates below, it is also (arguably) worth recalling how modest the interventions were in scale relative to the likely consequences of pursuing or not pursuing PSE. For example, the average exposure to EYH was 16 hours of additional classroom time — considerably less than the likely additional time someone who was not going to PSE commits to learning when EYH makes them decide to do so. While the additional effects of both the intervention and the additional education are inextricably bound together, it is quite likely that the lifetime effect of the additional induced education outweighs any additional benefit coming by other means out of the intervention.

Of course, experiments like FTD do not solve the problem of estimating lifetime earnings gains. FTD has tracked participants for 10 years starting when they were in Grade 9, with linkage to their tax records from Grade 12 onward. The current comparison of recorded incomes thus relates to the years 2007 to 2014 for PSE that was experienced (typically) in the first two to six years of this period. The experience of PSE is thus relatively contemporary, but the study has only seven years of income data to compare between program and control groups. While more years may plausibly be added later, each extra year of waiting for more data reduces the contemporary relevance of the education experience a little relative to interventions available to decision makers today. Keeping the PSE intervention experience contemporary has the downside of providing only a small window of post-PSE income comparisons between the groups. Inevitably, the analysis here requires any forecasting to be based on a very short post-PSE trend or trajectory.

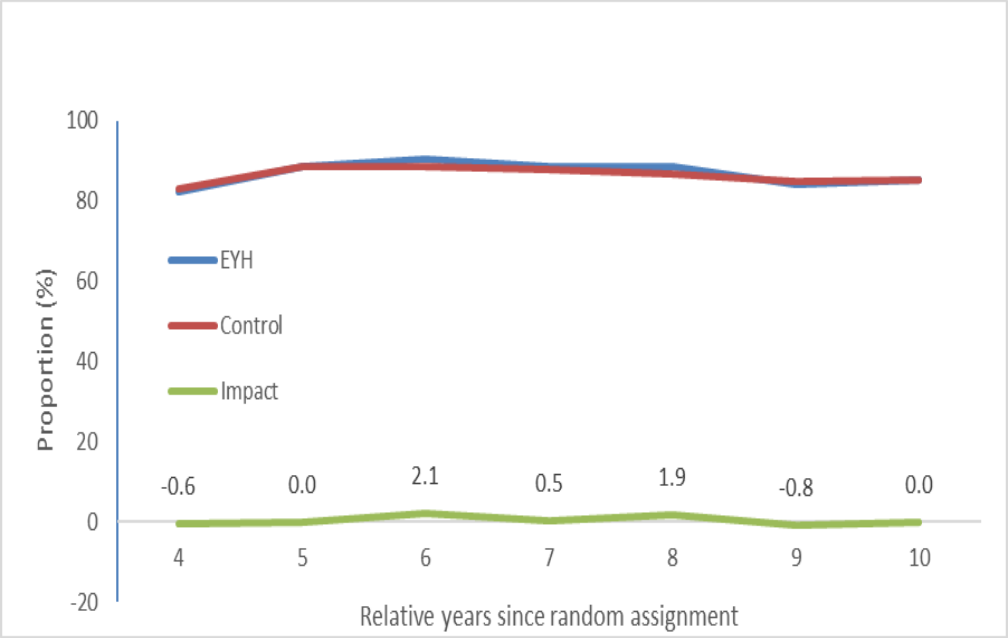
Of course, there are many different types of income to consider in tax records including social assistance, employment insurance benefits, self-employment and other income over various time periods (and these are included in the technical report). We concentrate here on generating conservative lifetime projections on the basis of two observed outcomes: earnings over the full postsecondary period (to acknowledge any "opportunity cost" from participating in more education due to lower employment while studying) and earnings in the last two years observed, when participants were roughly 23–24 years of age as these are the best years available in the data to observe any increase in earnings due to additional education experienced in the five years following high school. The analysis that follows involves a comparison of earnings over these periods for those offered each intervention versus the control group, starting with EYH.

Employment and Earnings Impacts Due to Explore Your Horizons

To avoid repetition, we explain the presentation of economic impacts for participants offered EYH in New Brunswick in some detail. Then we summarize results obtained using the same methods for Manitoba and for LA interventions in New Brunswick.

Overall, the employment impacts due to EYH were quite modest. The same proportion — 99% — of program-group members and control-group members reported earnings from employment at some point over the seven years after leaving high school. Although, as Figure 8 shows, the proportions reporting earnings each year varied from 83% to 91%, the offer of EYH made no statistically significant difference (even in the earlier years when most of any additional PSE studies would have been occurring). The impact of EYH by year rarely ventures more than 2 percentage points away from zero impact on employment.

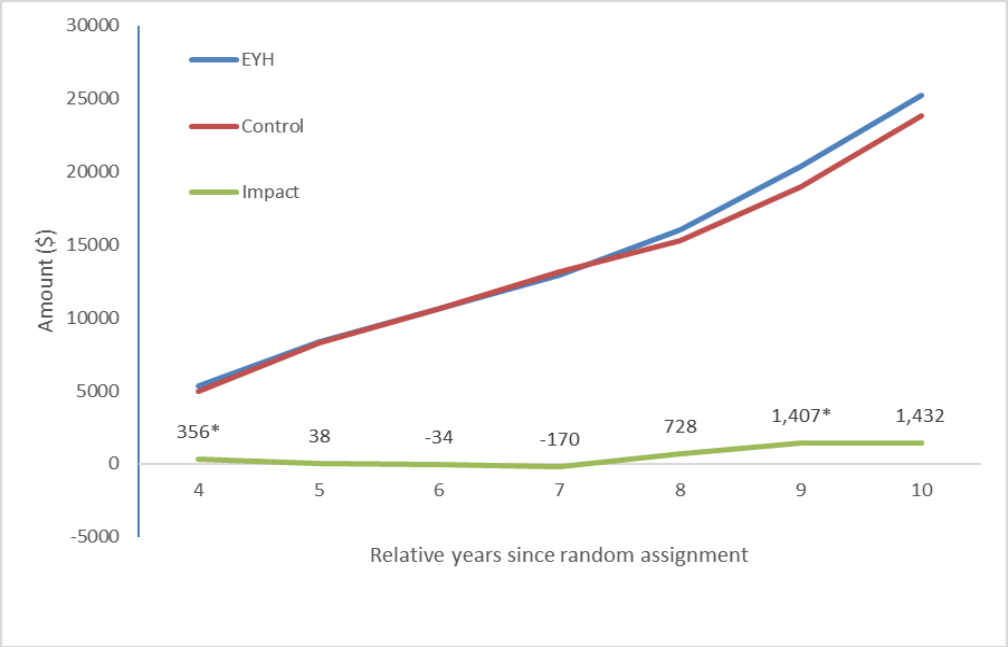
Figure 8: Proportion Reported Employment Earnings, Four to 10 Years after Random Assignment (New Brunswick)



The linked tax-records data provides annual snapshots and does not reveal hourly, weekly or monthly work effort, which EYH might have influenced. A more complete interpretation of the impact on employment thus comes from year-to-year changes in earnings, displayed in Figure 9.

Nearly everyone may have worked in every postsecondary year but the amounts being earned grew steadily with each successive year after the completion of high school. Average amounts grew nearly fivefold from roughly $5,000 in the year immediately following high school to $23,800 (for the control group) and $25,200 (for the group offered EYH) six years later, with the amounts statistically significantly different only in Years 1 and 9.

Figure 9: Employment Earnings, Four to 10 Years after Random Assignment (New Brunswick)



There are three important takeaways from Figures 8 and 9. The first is that there is very little obvious sign of a major additional opportunity cost to education. Young people in New Brunswick on average earn very little straight out of high school but there is virtually no difference between the EYH group, which was 3 percentage points more likely to engage in PSE, and the control group. The second is that an earnings differential that could be attributed to this additional PSE only becomes apparent around Year 8, becoming statistically significant in Year 9. The third is that these later earnings differences arise with virtually identical proportions reporting earnings as employees in Figure 8, so they are unlikely due to differential unemployment. Results (not shown) for self-employment, EI benefit receipt and social assistance bear this out: EYH did not statistically or substantively change labour market behaviour. It changed, albeit modestly, the financial returns from that behaviour.

To draw conclusions from the data in Figures 8 and 9 about lifetime income gains from additional education attributable to the EYH intervention, we need to make some assumptions. The main assumption is that the impact on earnings seen in the final two years observed (Years 9 and 10) is indicative of a difference in earnings that will persist through the remainder of FTD participants' working lives. This assumption is conservative in the sense that traditional human capital theories would expect the differential between those who receive education and those who don't to grow over time rather than remain constant.

Other more minor assumptions include:

- We assume no later program impact on education behaviour that might change the earnings differential after the 10-year period observed.

- We assume a discount rate on the future value of earnings. We use a 5% annual discount rate in conformity with many other studies. This is relatively high compared to contemporary interest and inflation rates but lower than the last Treasury Board recommendations for cost-benefit analysis (published in 2007). The analysis is therefore fairly conservative in attributing a dollar value over the longer term to the programs' impacts on education. We discount to the start of the study (2004–05) and, to simplify interpretation, convert all dollar values to 2018 dollars using the Bank of Canada inflation calculator and then apply the discount rate to any projected future costs and benefits. We use the term "net present value" to describe the result (i.e., the current value of an investment such as education plus the current value of its future returns, minus the initial cost of the investment and the present value of any future costs).

- We assume no income or differentials before age 18 or after age 54.

- We assume that the impacts on education and earnings derived from the experiment are the best available estimates for use in the projections. Even when the program-control differences presented in earlier figures were insufficiently precise to be found statistically significant, they remain the best available estimates of the impact of the program under test.

Table 2 presents the EYH earnings impacts and projections in stylized form to aid interpretation. The outcome column reprises the impact estimates from the first pair of columns in Figure 1. These results imply that 65% of the program group followed the stylized PSE attendee pathway, compared to 62% of the control group. Over the five-year, post-high-school PSE period, each program-group member earns an (unadjusted) average of $53,280 compared to $52,360 for each control-group member: a differential of $919 that is (unexpectedly) positive. In the final two observed years, when the participants are aged (roughly) 23 and 24, the earnings differential grows to $2,839. The simple projection shown in Table 2 is that this differential persists for 30 more years and since this period is 15 times longer than the two observed years, the earnings differential grows 15 times greater ($42,579). Converting these estimates to present value, 2018 dollars yields a projected (yet-to-be-observed) impact of $14,435 per participant between the ages of 25–54. The observed differential of $754 for ages 18–22 and $1,925 for ages 23–24 can be added to this earnings differential. This yields an effect with net present value of $17,115 per EYH program-group member in 2018 dollars.

Thus we estimate, very conservatively, the net effect for the average participant of being offered EYH to be equivalent to $17,115 in today's terms. This is a considerably greater value than the cost of offering them the program. But this figure is not really an estimate of the effects of additional education, since many did

not attend EYH and were unlikely to be influenced by the program to change education behaviour. And 62% of those offered EYH would have attended PSE anyway. Thus, it is very unlikely that each and every program-group member gains $17,115 from additional education.

Table 2: EYH Earnings Impacts and Projections

		Ages and stylized life stages							
Study sample	**Outcome**	15-17	18-22	23-24	25-34	35-44	45-54	55-64	65+
Program group (Offered EYH)	**PSE goer 64.96%**	High school	PSE	Labour market	Labour market			Retired	Retired
	non-PSE goer 35.04%	High school	Labour market		Labour market			Retired	Retired
	Mean Earnings (P)		**$53,280**	**$45,639**	***$684,586 projected***			-	-
Control group	**PSE goer 61.92%**	High school	PSE	Labour market	Labour market			Retired	Retired
	non-PSE goer 38.08%	High school	Labour market		Labour market			Retired	Retired
	Mean Earnings (C)	-	**$52,360**	**$42,800**	***$642,007 projected***			-	-
Impact on Earnings (P-C) (nominal)		-	**+$919**	**+$2,839**	***$42,579 projected***			-	-
Per year (nominal)			+$184	+$1,419	*$1,419 projected*				
Per year (in 2018 dollars)			+$206	+$1,530	*$1,530 projected*				
Present Value of Impact on Earnings in 2018 dollars		-	**+$754**	**+$1,925**	***$14,435 projected***			-	-

Interpreting the Economic Impacts

How should we attribute the net returns appropriately to assess the impacts of the additional education EYH induced? There are several options. To make consideration of distributing the gains a little easier, we move now to consider gains across a larger population than the per-participant-level estimates in Table 2. Instead of gains per student, let's consider gains across 1,000 sample-representative students in each of the program and control groups (the EYH program group was actually 1,207). Again, we work with the unadjusted estimate of the projected annual gains as shown in the penultimate row of Table 2: $1,530 per participant. Across 1,000 participants, the total gain per year would then be $1,530,000. How would this amount be distributed?

Figure 10 builds on the results from Figure 1 to illustrate ways of thinking about the share of the extra $1.53 million in earnings that might be going to different groups. The bars apply the distribution of PSE outcomes in Figure 1 to the 1,000 member program and control groups. Who goes or doesn't go to PSE with and without the offer of EYH? Per 1,000 members of the control group, with no EYH (in red), we found 619 attended PSE and 381 did not.

This is simply a representation of the second column in Figure 1. Per 1,000 members of the program group, with the offer of EYH (in blue), we assume 619 would have attended PSE anyway because their counterparts in the control group did so. And we observe 350 who do not attend PSE even with EYH. That leaves the remaining 31 in every 1000 who attend PSE due to the EYH intervention, because the only systematic difference between program and control groups that could have caused the increased attendance is the offer of EYH. FTD interventions were intended to change the behaviour of such marginal students (the primary policy target was high school students who would not have attended PSE but for the intervention). In the case of EYH, we estimate that there are 31 marginal students in every 1,000.

The $1.53 million in gains to the 1,000 program-group members per year could be allocated at least four different ways. Three are illustrated in Figure 10:

- **$1,530 to each person in the program group**. An average share of the gains to each member equally, as already discussed. This is not likely since many did not attend EYH and were unlikely to change behaviour due to the influence of the program. More than a third did not attend PSE at all, and we don't have a strong explanation for how EYH increases income without access to PSE.

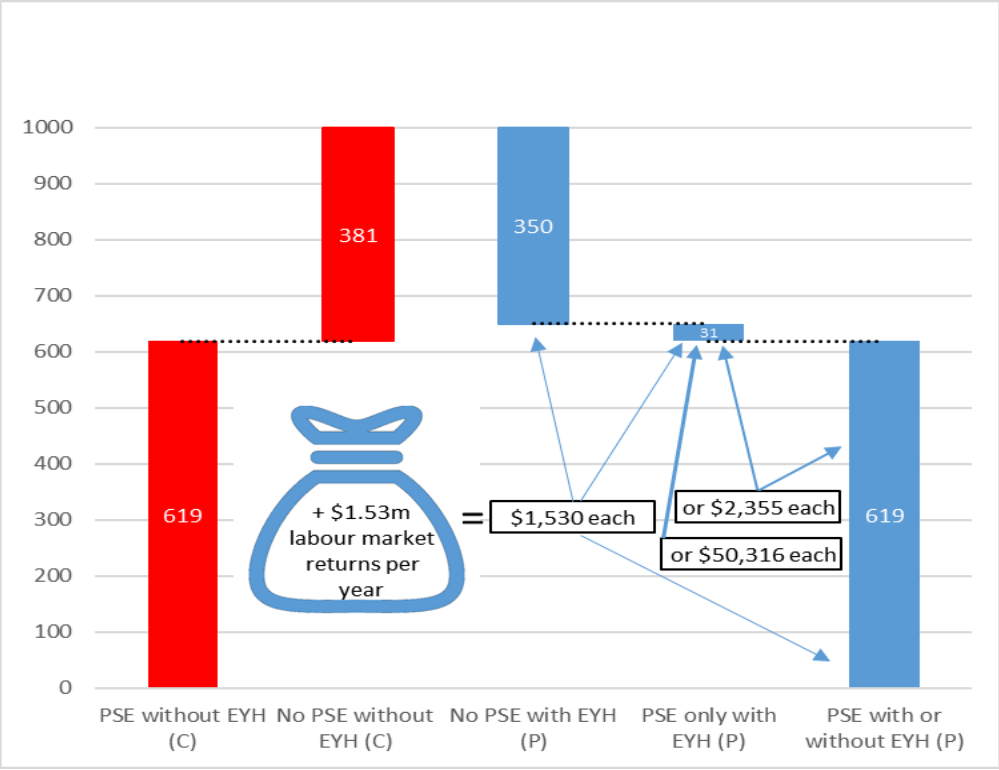
- **$2,355 to those who attended PSE**. More plausibly, we do not count people who did not access PSE among those who could have gained from increased earnings. In this case, the $1.53 million is divided only among the PSE attendees. Multiplied out over 30 more years, this division would yield an effect for each individual representing a net present value (in 2018 dollars) of $23,383. But still, as already noted, more than 60% offered EYH (and 95% of the PSE attendee group) would have attended PSE anyway. For every PSE attendee to gain more from PSE than they would without the EYH intervention, they would all need to have pursued a pathway that increased their earning potential over their choices without EYH, such as a better matched program.

- **$50,316 only to those who attended PSE due to EYH.** Allocating the $1.53 million only to the 31 whose educational journey was most obviously changed to include PSE is plausible. It assumes the influence of EYH on other program-group members was negligible with respect to influencing their earnings. Multiplied out over 30 more years, this division would yield an effect for each individual representing a net present value (in 2018 dollars) of $499,664. While high, this is not out of line with non-experimental estimates of the returns to education. Frenette (2014) found that on average, bachelor's degree holders made $36,600 per year (for men) and $22,412 per year (for women) more than their counterparts with a high school diploma. College certification yielded a premium of

$12,351 per year (for men) and $8,960 per year (for women). Applying Frenette's estimates to the FTD sample yields a return on PSE of about $22,000 a year (or a present value of $287,000 to the age of 55). Notably, most of EYH's impacts were in extra university enrolment, but on the other hand, EYH did not yield additional completions.

- **Only to those who complete PSE**. EYH increased the number of graduates by slightly more than one in every 1,000 to whom it was offered. If the gains to PSE arise only from the additional graduation, then the gains per individual would exceed $1 million per year, which is not a plausible allocation and not shown in Figure 10. If the gains to PSE arise only from graduation, then the earnings impacts from EYH present a mystery. Graduation could still plausibly be the main trigger for PSE-related earnings gains if EYH changes the PSE pathway and the nature of credentials in ways that our data could not detect. That could explain how the same number of credentials in program and control groups yields different earnings outcomes. In a related explanation, EYH might have altered choices of occupations or students' abilities to realize their choices, and thus allowed them to achieve higher incomes.

Figure 10: Postsecondary Destinations With and Without EYH per 1,000 Program-group Members



There is no simple way to determine which of the above allocations best represents how and for whom EYH induced earnings gains. We prefer to consider a range and so use the term "upper bound" to refer to the

highest level an estimate might attain given the assumptions inherent in the estimates and variation in the data, and likewise for "lower bound." The upper and lower bounds of the effects on education due to EYH likely lie between the second and third bulleted options above. If the dominant effects of EYH tended more toward expanding access to education, then the project's estimated returns to education access looks to be approaching $50,316 (or $499,684 over a lifetime). If the dominant effects of EYH tended more toward changing existing students' choices within education (and their subsequent occupations), then the estimates of returns cannot be so heavily attributed to new education participation. In the latter case, EYH may have affected earnings for a wider swath of those to whom it was offered and thus by smaller amounts, closer to the minimum of $2,355 per PSE participant (representing a net present value of $23,383 over a lifetime).

These upper and lower bound estimates are repeated in Table 3, along with findings derived using an equivalent methodology for the important LI subgroup offered EYH in New Brunswick. The impact on earnings at ages 23–24 were very similar for students from lower-income families as for the all-income sample, albeit slightly larger. Because fewer students from lower-income families participate in PSE, assuming only the PSE attendees benefit from the earnings gains (for the lower bound estimate) yields a higher return for lower-income students. But because the impact of EYH was almost twice as high among these students from lower-income families (Figure 1 shows it is close to 6 percentage points compared to 3 percentage points for all students offered EYH) the upper bound estimate of gains to new PSE attendees turns out to be lower, with a net present value in 2018 dollars of $300,748 compared to $499,664 across the whole sample.

Table 3: Estimates of Returns to Education from Different Interventions

	New Brunswick			
	All	Lower-income families		
	EYH	EYH	LA	EYH+LA
Impact on Earnings (P-C at ages 23–24) (per year)	1,530	1,669	660	1,062
Present value of Impact on Earnings (projected 30 years)	14,435	15,753	6,226	10,019
Allocation of returns				
Lower bound: If all who participate in PSE receive earnings gains				
Annual gain in earnings	2,355	3,078	1,190	1,969
Net present value	23,383	31,217	7,954	13,699
Upper bound: If only new PSE goers receive earnings gains				
Annual gain in earnings	50,316	29,649	10,133	17,994
Net present value	499,664	300,748	67,709	125,171

All estimates adjusted to 2018 dollars.

Manitoba results are not included in Table 3 because the equivalent analysis yielded no earnings gains from EYH. The program group in Manitoba earned an average $47,261 when aged 23–24 in Years 9 and 10. While similar to the $49,151 earned for the equivalent period by EYH participants in New Brunswick, the Manitoba program group earned less on average in this period than the Manitoba control group, which earned $50,527. This difference of $3,266 over the two years is not statistically significant but, coupled with an absence of significant impacts on PSE access from Figure 3, it implies that EYH did not change education or employment outcomes for the better in Manitoba. These findings mean the Manitoba arm of the experiment cannot meaningfully contribute to this report's measurement of returns to additional education. Although it is interesting to consider why the same EYH intervention yields different results in different provinces, it is worth recalling that the magnitude of the changes in education outcomes from EYH are modest in both provinces: modestly positive in New Brunswick and not significantly different from zero in Manitoba. While we have considered the impacts from EYH in New Brunswick at some length to present the methodology involved in estimating returns to education interventions, there are two other education interventions in New Brunswick (LA and EYH+LA) that yielded larger magnitude impacts on education. Estimates of the returns to additional education induced by these interventions are presented in the final two columns of Table 3 and reviewed in the next section.

Summary of Earnings Impacts

The best available estimates of earnings gains from PSE due to offering LA and EYH+LA are shown in Table 3. The average impact on earnings across years 9 and 10 when the participants were aged 23–24 was $660 for LA and $1,062 for EYH+LA. These effects are smaller than for the same population offered EYH alone. The 30-year projections are correspondingly lower also. The smaller differentials occur despite the larger impacts in percentage-point terms on PSE participation and completion seen for LA and EYH+LA in Figures 3 through 6 compared to EYH alone for LI families in Figures 1 and 2.

Part of the explanation for greater earnings differentials with the offer of EYH rather than LA comes from the different types of PSE enrolment and completion the interventions encourage. For lower-income students, EYH encourages additional university enrolment, including when it is combined with LA, but LA alone encourages additional college enrolment. LA also encourages additional college completion when offered on its own or with EYH. Thus the earnings gains from EYH are attributable to employment following additional university enrolment, but the earnings gains from LA flow from employment achieved by those with additional college participation and (for some) an additional college credential they would not have received without the intervention. It is firmly established that occupations requiring a college education earn less on average than those requiring university (Frenette's (2014) estimates suggest around 60% less). But the surprising findings here are (a) that the additional university enrolment in EYH did not need to produce additional graduation to produce earnings improvements over those from college, and (b) the equivalent magnitude additional university enrolment from EYH+LA as for EYH did not yield such large returns. It is almost as if obtaining a college credential masked the effect of additional university enrolment

to some degree, as EYH+LA earnings gains (at $1,062 per year) sit between those for EYH (at $1,669) and LA alone (at $660).

Earlier, we ventured two plausible explanations for the education impacts of EYH+LA. Either (a) EYH+LA increased the completion rate of students who would have gone to college anyway or (b) EYH+LA induced two effects simultaneously such that some students who would have gone to college took up university instead (while not completing) and other students who would not have attended PSE at all went to college instead and completed it. The evidence on earnings gains from EYH+LA and LA alone supports more closely the second of these explanations, implying that the gain in earnings from additional college enrolment under EYH+LA is more in line with LA (than EYH) results. Our interpretation is that the gains in EYH+LA come from a blend of the higher effects of the additional university participation EYH induced (among those who would previously have gone to college) with the lower effects of the additional college enrolment induced by LA.

The lower bound and upper bound estimates of the returns to the education induced by LA and EYH+LA appear in the lower part of Table 3. These allocate gains to different groups that could benefit, but broadly follow the same logic and relative magnitude as the projected earnings discussed above. The interventions produced larger magnitude impacts on enrolment, thus the upper bound allocations do not change the story on the pattern of returns. Omitted from Table 3 are estimates assuming only graduates receive the gains. Such an interpretation would nonetheless yield similar returns to education. The magnitude of the graduation impact from LA is very similar to its enrolment impact, so allocating returns only to the additional graduates is similar to allocating them to the additional enrolled students, at $9,773 compared to $10,133. As previously stated, Frenette (2014) found college certification yielded a premium of $12,351 per year (for men) and $8,960 per year (for women). FTD results by sex are published elsewhere (e.g., Ford, Hui & Kwakye, 2018), but in general they find enrolment and graduation impacts concentrated among males.

Interpreting FTD's Findings

FTD yields a set of thought-provoking findings. The substantive conclusion is that, for New Brunswick at least, the returns to encouraging youth to participate more in education, regardless of whether it leads to higher graduation rates, are substantial. The estimates are in line with those derived using alternate methodologies. The returns vary by intervention and are substantially positive regardless of the intervention. But there are cautions: (a) pathways followed from one intervention to the next can be very different, suggesting youth behaviour is quite sensitive to the implicit and explicit prompts that interventions provide, (b) the effects of the interventions are not necessarily additive (in the context of Future to Discover, effects were definitely not additive), (c) estimates of returns are based on two relatively junior years of labour market experience where there is high variability in earnings, and (d) no effects are apparent when interventions produce no significant impact on education participation, as was the case for Manitoba, even with an EYH intervention designed and implemented in ostensibly the same way as for New Brunswick. These cautions point to a need for very careful design and tailoring of interventions to the targeted population, the targeted outcomes and the specific education system context. Finally, while

education impacts for New Brunswick are significantly positive for many of the groups and interventions, few "best estimates" of the returns are statistically significant and thus may contain a substantial component of error. Longer-term follow up is advisable.

There is nonetheless cautious positive news from FTD for those who promote and implement access programs. Access interventions are often criticized in that they may increase the application to and enrolment in PSE of marginal students without providing sufficient support once they reach PSE to help them complete it. It is presumed that marginal students will need more supports to complete their PSE studies than are normally made available to students who attend PSE without additional intervention. The results from LA suggest this need for more support is not the case, at least not on average. LA induces at least as many additional students to graduate as it induces to enrol in PSE. This is not to say support services are not needed: If Figures 1 through 7 highlight one universal truth, it is that in general students have a surprisingly low chance of completing their studies within seven years, and this observation applies with or without FTD interventions.

The LA results have at least two alternative explanations depending on whether LA is interpreted to modify the behaviour of one small group in one way or to modify behaviours within a much larger group in two different ways. Plausibly, in the first case, LA may simply encourage a cohort of normally non-PSE destined students to enrol in and complete PSE. Equally, in the second case, a plausible explanation is that LA helps existing college attendees who would not normally complete PSE to graduate and it helps equivalent numbers of marginal students enrol but not complete PSE. Of course, despite the increased graduation, a need for additional support services is implied in both situations. This is because both explanations involve students enrolling but not graduating, whether motivated to do so by LA or not. Importantly, getting more low-income students into PSE, as LA does, has not worsened the drop-out rate.

Perhaps the most unexpected conclusion on the question of persistence from this, SRDC's final round of planned FTD analysis, is that uncompleted university may in some way yield higher returns than completed college. If true, this finding again counters the criticism that access interventions are not effective if they do not also support persistence and graduation. It certainly seems true that attending some PSE, even without completion of a credential, is better than attending none. This conclusion makes sense if education imparts to participants skills and/or social network changes favoured by the labour market. But is participating in university without reaching a credential better than completing college with a credential? Before drawing this latter conclusion, several caveats are required as well as more analysis.

The first caveat concerns what can actually be deduced from the experimental findings. Specifically, what FTD finds is that promoting PSE participation in a way that induces more university enrolment without any accompanying increase in university graduation produces larger financial returns, at least by ages 23–24, than promoting PSE participation in a way that induces more college enrolment and corresponding increases in college graduation. The first big caveat is that financial returns from EYH may not come from students who are new to PSE, but rather from existing PSE students who complete better-matched studies or follow more lucrative career paths. Table 3 shows financial gains are actually somewhat larger for those from lower-income families. Not shown in the table are even larger projected earnings impacts for LILE and FGF

groups. If these groups have less PSE experience at home to guide them, arguably they might normally (without EYH) make less effective PSE choices. That these groups see larger earnings gains from EYH is consistent with the idea that EYH improves the choices of those who would go to PSE and graduate anyway (assuming higher-income students or those with higher-educated parents would make better choices without the external support of EYH). The impact of EYH would not be attributable to more graduation but to more immediately rewarding occupational pathways or matches (that — outside of their effect on earnings — are harder to observe in the available data). That said, higher benefits for this group are also consistent with there being returns for university experience in the absence of graduation.

The second caveat is that ages 23–24 may be both too early and too short a period to get a firm reading on the earnings effects of education. Those who tried university and did not complete it may just be earning more because of tangential benefits flowing from their education decision. Perhaps the motivated students had to move more often to a town with a university, which (perhaps) had a more robust labour market to support them, even if they held no credential past high school. Perhaps their social network expanded and with it work opportunities. Whether they graduated or not, perhaps those motivated to attend PSE had access to a youth-friendly career centre at their university and found more lucrative employment, without having to graduate. This finding might even flow from the financial demands that EYH participants faced in attempting to persist in their studies. We note from the data that, even after seven years, many without a credential have not left university. As Ford, Hui and Kwakye (2018) report, EYH produced no statistically significant impacts on leaving PSE without completing. Over seven years, some 54% of the EYH group enrolled in university or college while 29% graduated and 14% left. This means that at the end of the observed period, 11% were still studying. Some of these may be additional students earning more than their control group counterparts with a view to paying their way through to completing their studies at age 25 or older. Thus, they may be aiming for graduation *after* the data reported here was collected. This scenario would not signal that non-completion of university yields lifelong career benefits! At least not yet. There may be just too many possible alternative explanations to draw firm conclusions from the youths' experiences observed to date.

A longer follow-up period is needed to better track the earnings progression of LA and EYH participants, and enable a better understanding of where their education leads them. Analysis of more years of data would certainly help to firm up the tentative estimates presented here.

Concluding Summary

The two main conclusions from FTD are that both career education and early-promise grants can work to increase postsecondary access and that when such interventions do increase access there are likely substantial returns to the education they cause. The endeavour to increase access for students who do not currently attend is worthwhile.

One of the two important caveats from the project is that enhancing career education will not be equivalently successful in different settings. The results from EYH so far suggest that encouragement of all

forms of PSE equally offers a higher risk strategy, with potentially higher payoffs when it works, such as in New Brunswick. The effect on PSE access and higher earnings in Manitoba is unclear for the most part. The second caveat from the evidence is that the story of how to increase access is far from simple. The impacts of effective interventions are not necessarily additive. We may well improve the livelihoods of marginal students by improving their choices within PSE as much as by switching non-PSE attendees to become PSE attendees or even PSE completers.

It is to be hoped that researchers will continue to add to and dissect the rich data FTD has created in order to firm up the emerging story over time. FTD's experimental design provides a rigorous framework for attributing outcomes to interventions and disentangling them from outcomes that would have happened anyway without new interventions. Such analysis helps to improve the accuracy of targeting any future new resources to those who truly need them and thus to better inform future policy and practice. The implications are set out below.

Implications for Policy and Practice

FTD's results provide compelling evidence to support future education policies and community initiatives that aim to find ways to support students in having equitable access to PSE in order "to fulfill their dreams, achieve their potential and thrive in the global knowledge economy" (Ontario, 2017). The project also provides insights on how to effectively engage young people, how best to implement new programs and on the conditions that are more likely to lead to success.

1. **FTD provides a clear and compelling case both that postsecondary access can be increased for those groups of students currently least likely to attend PSE and that the additional PSE will benefit them.**

The strong positive results from offering both EYH and LA to lower-income students, especially those from first-generation families demonstrate that more can be done to equalize postsecondary participation. In general, those groups with the lowest rates of participation (as observed in the control group) experienced the largest impacts when offered FTD interventions. Furthermore, in all cases where there was an impact on PSE access, there was also an impact on the financial returns (in the form of later earnings) experienced by the group whose access was increased.

2. **Effective programming to increase PSE access can not only help fulfil policy goals focused on improving equity between young people, but also offer a long-term business case for government investment.**

We have focused here on returns to individuals and have seen that these can be high for students from lower-income families. A portion of these returns will go to government as well in the form of more tax revenue from higher earnings. The 2012 FTD report presented a more thorough benefit-cost analysis, including the returns to government. It found EYH economically viable for New Brunswick lower-income, lower-education families. LA's relatively low administrative cost made it particularly effective for the same

group. It generated $2.00 to $3.40 benefit for each dollar spent by government. The program's cost-effectiveness was driven by the large postsecondary participation impact achieved by students from lower-income families.

Combining EYH with LA adds to costs and does not increase the net social benefit. However, EYH+LA was still economically viable. It generated $1.51–$1.75 benefit for each dollar spent by government.

3. **As an experiment, FTD did not fully exploit the means available to policy makers and practitioners to maximize the impacts of its interventions. Bringing enhanced career education into mandatory classes and making early-promise grants a part of the student financial-aid system seems likely to increase their impact and effectiveness.**

SRDC's analyses carefully preserve an appropriate statistical comparison by comparing outcomes for the whole control group to the whole program group. In fact, only a portion of the program group received the treatments. Not all remained aware of the offer made and even fewer took up EYH or LA. EYH delivered 16 hours of workshops over three years to the average participant to whom it was offered, and even less to members of the more disadvantaged target groups. LA offered $8,000 but actual payments averaged $2,700 given the low take-up. These are quite modest interventions relative to lifetime expenditures per student, yet produced substantial impacts. By making such experimental interventions more broadly available as programs to all targeted students, awareness and take-up would likely increase, allowing the effect on PSE access to be extended to more students. It would also reduce the costs per targeted student of delivering the programs due to economies of scale.

4. **Within broadly defined PSE access objectives, relatively modest but different interventions can direct students to very different pathways. Program designers should carefully consider their target group's current educational programming context and resulting pathways alongside their overall program intent as youth are very sensitive to small but timely nudges when it comes to their postsecondary decisions. A rigorous evaluation framework is critical to understanding the effects of new programming.**

EYH had few significant impacts on PSE access in Manitoba except to increase college enrolment in first-generation families. In New Brunswick, EYH had no impact on college enrolment for any group: It produced atypical pathways, sending students from lower-income and first-generation families to university. With a rigorous evaluation framework, we can understand such effects of programs and consider their merits. Without evaluation, there is a risk not only of introducing multiple and competing programs that duplicate or cancel out each other's effects, possibly yielding outcomes that are less than optimal for the individuals involved but also of not knowing that this is their effect. Policy makers and practitioners can use evaluation to fine tune program design and better fulfill their objectives and align the types of PSE pathways to better match individual aspirations and future economic realities.

5. The potential of PSE to transform individuals' lives and the broader economy should not be underestimated.

FTD provides a very rare chance to see what happens when a group of young people go to PSE who would not have gone otherwise. The project's estimates of the earnings impacts in New Brunswick based only on earnings at ages 23–24 represent gains of $1,530 per participant annually for EYH, $1,062 for EYH+LA and $660 for LA alone. The impact of this additional income on the broader economy depends on how widespread the intervention is implemented and assumptions with respect to equilibrium effects: Is the labour market sufficiently flexible and adaptive that it could expand workforce opportunities given an intervention-induced increase in the influx of new skills?

FTD was small in economic terms. Only 3,015 New Brunswick youth in two Grade 9 cohorts were offered one of the three FTD treatments. New Brunswick has about 7,500 youth (five times the treatment sample) in each Grade 9 cohort. Without equilibrium effects, we can already interpret annual earnings gains from the experiment alone as totaling more than $2.5 million annually. If the interventions had been repeated for later Grade 9 cohorts, each cohort would further add to the economy annually. And if interventions were expanded beyond the research project to a wider population, projected economic gains could feasibly double. It is not necessary for assumptions about equilibrium effects to hold perfectly, nor to quantify accurately the incremental effect of an education-induced differential persisting through the working lives of each treated cohort to realize that gains to individuals could equate to broader economic gains. Access interventions hold remarkable potential. In Ontario, for example, each Grade 9 cohort is 20 times the size of New Brunswick's.

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Higher Education Quality Council of Ontario

An agency of the Government of Ontario