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The opinions and interpretations in this publication are those of the author and do not necessarily reflect those of the Government of Canada.

ABOUT THE CANADIAN APPRENTICESHIP FORUM

The Canadian Apprenticeship Forum – Forum canadien sur l’apprentissage (CAF-FCA) is a national, not-for-profit organization working with stakeholders in all regions of Canada. We influence pan-Canadian apprenticeship strategies through research, discussion and collaboration – sharing insights across trades, across sectors and across the country – to promote apprenticeship as an effective model for training and education. Our Board of Directors is comprised of representatives of business, labour, the jurisdictional apprenticeship authorities, education and equity-seeking groups. Through our work, CAF-FCA has shed light on a number of key issues affecting apprenticeship, such as the perceived barriers to accessing and completing apprenticeship and the business case for apprenticeship training. For more information, visit the CAF-FCA website at www.caf-fca.org.
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1.1 OVERVIEW

The *Flexibility and Innovation in Apprenticeship Technical Training* (FIATT) project funded ten pilots. Each pilot experimented with alternate delivery technical training. Institutions involved in the FIATT project included the British Columbia Institute of Technology (BCIT), Collège Boréal and Lambton College,¹ New Brunswick Community College (NBCC), Nova Scotia Community College (NSCC), the Operating Engineers Training Institute of Ontario (OETIO), Portage College, Red Deer College, Saskatchewan Polytechnic, Thompson Rivers University and Yukon College. The FIATT pilots used various alternate delivery approaches: a combination of online and classroom learning, online and mobile training units, online with instructor support in the community, simulators and upfront training in a First Nation community. Courses were created for the carpenter, construction electrician, gasfitter, heavy-duty equipment technician, mobile and tower crane operators, plumber, refrigeration and air conditioning technicians, steamfitter/pipefitter and welder trades.

¹ Collège Boréal and Lambton College worked together on their pilot project.
From 2015 to 2018, the Canadian Apprenticeship Forum-Forum canadien l’apprentissage (CAF-FCA) implemented evaluation activities. The evaluation questions asked whether the pilots:

- attracted under-represented groups
- facilitated program progression and completion
- enhanced employer participation and support for apprenticeship
- reduced impacts on workflow
- reduced demands on the Employment Insurance (EI) system
- reduced education costs
- reduced non-financial and financial barriers for participants
- prepared participants to work in the trades

The report answers each of these evaluation questions drawing upon interview findings, questionnaires and survey findings.

1.2 EVALUATION FINDINGS

CAF-FCA compared the perceptions and experiences of 548 apprentices in block-release apprenticeship training to 403 apprentices who participated in the FIATT pilots. Pilot participants completed pre (N=268) questionnaires (before the training began) and post (N=135) questionnaires (after the training was completed). Differences were noted between the block-release and the FIATT participants:

- More FIATT apprentices relocated (40 and 43 per cent for pre-and-post questionnaire apprentices compared to 21 per cent for block-release apprentices).

- The average time away from home was reduced for FIATT apprentices. Block-release apprentices were away from home for 13 weeks compared to FIATT apprentices who were away 5.5 weeks.

- FIATT apprentices incurred less costs when relocating. Block-release apprentices spent $3,129 relocating and FIATT apprentices $2,000.

- FIATT apprentices were more likely to agree their training was flexible compared to block-release apprentices (73 versus 60 per cent).

- FIATT apprentices missed fewer hours (207 hours) of work than block-release apprentices (398 hours) and reported fewer lost earnings.

- FIATT apprentices received EI for 7.9 weeks and block-release apprentices received it for 9.2 weeks. Average payments for FIATT apprentices were $2,108.12 compared to $3,598.24 for block-release apprentices.
• Block-release and FIATT apprentice attitudes towards their technical training were similar. FIATT apprentices volunteered to participate possibly explaining their positive responses. The broader apprentice population may not be as enthusiastic about alternate delivery options. Apprentices agreed their technical training provided sufficient access to instructors (both 85 per cent). FIATT apprentices were more positive than block-release apprentices when asked about access to tools (82 versus 71 per cent). Seventy-five per cent of FIATT apprentices and 72 per cent of block-release apprentices agreed they developed the skills required to succeed in their trade.

1.3 BEST PRACTICES
Based upon their pilot experiences, administrators and instructors identified these best practices:

• **Involve faculty in program development and build capacity:**
  Involve faculty in program development and facilitate connections between trades instructors and IT specialists so the online learning content is engaging.

• **Encourage employer involvement in alternate delivery initiatives:**
  Employers may become less skeptical of alternate delivery initiatives if they are involved in the technical training. Employers can validate course content, participate on steering committees and provide “real-world” examples ensuring apprentice learning aligns with the latest industry standards and workplace practices.

• **Support apprentice progression:**
  Alternate delivery options, by offering flexibility and accessibility, encourage apprentices to complete additional levels of training. Structuring online courses to offer reminders about upcoming quizzes and assignments supports apprentice progression.

• **Establish partnerships:**
  Partnerships between colleges and First Nations give the communities a sense of ownership over the training facilitating participant recruitment and program co-ordination.

Alternate delivery options, by offering flexibility and accessibility, encourage apprentices to complete additional levels of training.
1.4 LESSONS LEARNED
The administrators and instructors provided these lessons learned:

• **Collaborate with provincial and territorial apprenticeship agencies:**
  Consulting with the provincial and territorial apprenticeship administrators clarifies
  jurisdictional requirements and should be done early in the pilot development process
  to avoid administrative delays.

• **Spend time on program development and secure buy-in:**
  Employers and faculty who are skeptical about alternate delivery will require information
  workshops about the pilot and department-wide consultations. Allot time for these
  consultation activities at the beginning of the project.

• **Consider apprentice recruitment challenges:**
  Apprentice recruitment was a challenge. Targeting groups of apprentices who are
  interested in alternate delivery and larger trades ensures there are a greater number of
  potential candidates to participate in alternate delivery initiatives.

• **Enhance connectivity and capacity in remote and rural communities:**
  Ensuring there is consistent internet access is important when setting up a pilot project.
  Additional costs associated with supporting internet access or upgrades should be
  included in the project budget.

• **Address essential skills and employability gaps:**
  Offering dedicated essential skills training, tutoring and job coaching is required for
  some learners.

• **Be aware of logistical issues:**
  Apprentices require clear information about logging into online courses. Instructors
  should consult with the IT department in advance about the appropriate instructions.

• **Continue to seek out the most flexible learning technologies:**
  Institutions should explore new technologies and integrate those new technologies into
  their courses.

• **Develop strategies to verify apprentice knowledge:**
  On-campus tests verify apprentice knowledge and ensure they understand the material
  learned online.

• **Consider additional costs:**
  Translating content into French can be expensive. These costs should be considered
  when developing project budgets.
The FIATT initiative funded ten alternate delivery pilots. The majority of the pilots involved a combination of in-person instruction and online courses. Other pilots experimented with upfront training, mobile labs and/or simulator training. The FIATT pilots shared goals linked to common apprenticeship challenges, emphasizing the applicability and importance of the initiative:

- Help apprentices progress and complete their training
- Reduce waitlists, time away from the workplace and the number of weeks on EI
- Create access to hands-on training, especially for rural and Northern apprentices, through simulators and mobile training units
- Engage apprentice learners, instructors, employers and/or underrepresented groups in online training
- Support apprentice learning and skills development

The objectives of CAF-FCA’s work were to create awareness among apprenticeship stakeholders about the FIATT initiative, enhance connections between the pilot administrators and develop and implement an evaluation framework. This report summarizes the evaluation results.
3.1 TRADITIONAL TECHNICAL TRAINING AND APPRENTICESHIP

Apprentices spend 80 per cent of their time learning at the workplace and 20 per cent of their time at a technical training institution such as a college, union training centre or private trainer.\(^2\) The latter is typically referred to as the “in-school” portion of the training. In every jurisdiction except Quebec, employers agree to release the apprentice to attend technical training with alternating on-the-job periods. This generally means apprentices spend six to 12 weeks at an institution or training centre per year of apprenticeship. This delivery method is known as “block-release.” Apprentices earn an income while learning on-the-job, however, there is a gap in earnings for the in-school portion of their training. Apprentices can apply for and receive EI benefits, if they meet program eligibility requirements, during the in-school portion of the training. If apprentices are registered in Red Seal trades, they may also be eligible for the Canada Apprentice Loan. Training centers may be in a different geographical location requiring relocation. In most cases, apprentices attending technical training in another community or province from their main residence are responsible for finding their own accommodation.

However, some jurisdictions such as the Yukon, do offer financial support to help cover the cost of accommodation and travel.

Apprenticeship training is based on the completion of a pre-set number of hours and technical training levels. While programs are typically four years long, the precise training requirements vary across provinces/territories and trades and the nominal program duration and actual time to completion can vary significantly. After apprentices complete the necessary hours and levels, they write a multiple-choice examination and, in a few cases, are required to perform a practical assessment demonstrating their skills. For Red Seal trades, apprentices who achieve 70 per cent or more earn a Certificate of Qualification with a Red Seal endorsement. Apprenticeship completion and certification helps to produce a highly skilled, qualified trades workforce crucial to meeting industry demand.³

### 3.2 CHALLENGES ASSOCIATED WITH BLOCK-RELEASE TECHNICAL TRAINING

Common challenges for apprentices pursuing block-release technical training include

- financial hardship for apprentices when at school (i.e. lost earnings, relocation costs)
- concerns about leaving family and friends when relocating
- low volume trades not offering classes due to small numbers
- long waitlists

Some employers find the block-release schedule inconvenient and do not want to lose the apprentice at the workplace, especially during busy periods. The costs of new equipment and the wear and tear caused by new trainees is an additional challenge for employers and training institutions.

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³ For more information about the Red Seal Program or apprenticeship processes specific to each jurisdiction, see the Red Seal or provincial/territorial apprenticeship agency websites.
3.3 ALTERNATE DELIVERY SOLUTIONS: AN OVERVIEW OF THE FIATT PILOTS

The pilots offered varied alternate delivery options in different trades. The majority of the pilots lessened financial hardship and personal stress for apprentices by reducing the number of weeks away from home. Apprentices took online courses, did training at a local community center or learned in mobile training units. Most kept working and earning wages. Apprentices practiced their skills on simulators without damaging expensive equipment.

British Columbia Institute of Technology (BCIT)

BCIT created an interactive online course for gasfitters, steamfitter/pipeliners, plumbers and refrigeration and air conditioning technicians. The course included instructor-led sessions and virtual forums for apprentice interaction, with both structured and unstructured tasks. Ten web-based simulations and 36 videos and animations were created. The learning materials developed were pilot tested with four cohorts of gasfitter A and B trade qualifiers who were preparing to write their Certificate of Qualification examination. The feedback from the students helped instructors refine the existing materials and develop new learning resources. Recruitment challenges prevented the course from being delivered. Apprentices who were surveyed felt studying online at night would be too difficult after working all day.

Collège Boréal and Lambton College

Collège Boréal worked in collaboration with Lambton College to create an online course for carpentry. Collège Boréal also created a course for the heavy-duty equipment technician trade. The courses, offered in English and French, are highly interactive with animations and videos. Recruiting and retaining Francophone apprentices is difficult because there are few Francophone instructors and tradespeople teaching technical training in Ontario. The pilot provided an important opportunity to develop French content and videos for Francophone students.

New Brunswick Community College (NBCC)

NBCC’s pilot enhanced online courses and simulator use in the refrigeration and air conditioning technician and welder trades. NBCC conducted outreach and promotional activities in a mobile training unit, targeting rural and under-represented students, including those in First Nation communities.

4 For additional examples of alternate delivery initiatives from across the country, see the Canadian Apprenticeship Journal, “Flexibility and Innovation in Apprenticeship Technical Training.”
Nova Scotia Community College (NSCC)

NSCC provided construction and industrial electricians access to a mobile learning lab, simulation technology and online learning. The unit traveled to different campus locations, community centers and employer sites providing 25 rural apprentices training opportunities. Eleven apprentices who received training in the mobile training unit became certified with a Red Seal endorsement. NSCC offered all 33 theory courses in an online, interactive platform. One hundred apprentices enrolled in the online theory courses and completed 147 courses. Fifty-four apprentices completed Level 2, 3 or 4. One hundred and ninety-two training simulations were created. Eight hundred apprentices completed their levels utilizing simulators.

NSCC made its content and tools available to a larger group of apprentices. All 33 online courses created by NSCC are open to any electrical apprentices in Canada. To take the course, the apprentice must make a request through their provincial/territorial apprenticeship agency. In the past, apprentices working in the Western provinces waited until they were laid off and then returned home to complete their technical training. Online courses offer apprentices the opportunity to pursue work opportunities in other provinces while still progressing in their training at NSCC. A final agreement between the Prince Edward Island Apprenticeship Agency and the Nova Scotia Apprenticeship Agency was signed so Prince Edward Island apprentices may access training opportunities. Three Prince Edward Island apprentices enrolled in online courses. The mobile training unit can be moved to any of NSCC’s thirteen campuses, community centres, work sites and remote sites, as required. All other FIATT resources and tools function as stand-alone resources and/or work in combination with one another.

Ontario Engineers Training Institute of Ontario (OETIO)

OETIO purchased six new crane simulators for mobile and tower crane operators as a part of its pilot project. OETIO also upgraded two of its existing simulators to meet current hardware and software standards. Simulator training in the classroom supplemented the lectures and provided practical, hands-on training. Apprentices spent an additional 60 hours of seat time operating either an actual crane or a simulator and accessed simulators after hours or on weekends. A database tracked apprentice progress against industry expectations in terms of performance and production. Instructors monitored individual student progress and recommended new techniques. By enabling practical learning of more complex employer-driven training scenarios, apprentices rehearsed difficult and/or dangerous scenarios in a controlled environment. OETIO worked with employers to design these scenarios ensuring the skills developed were transferrable to real-life conditions. The simulators also provided opportunities for applied learning. For example, the application of two crane lifts working in tandem is commonly used at wind farms. In the past, apprentices would learn about this concept in theory only. The simulators enabled apprentices to practice the application reinforcing their theoretical learning. Apprentices who struggled on the cranes could go back and practice on the simulators. When the cranes malfunctioned, training was not delayed because the apprentices could use the simulators. Ninety-six apprentices received training. The OETIO also used the simulators in its career awareness efforts providing young people a better idea of the tasks involved in the mobile and tower crane operator trades.
Portage College
Portage College’s pilot project offered a combination of online and classroom training for two rural heavy equipment technician apprentices.

Red Deer College
Red Deer College offered upfront technical training in the welding trade, beginning with simulator training in a First Nation community. The remainder of the cohort preparation included on-campus training, online learning, innovative testing models, personal development and a co-op work placement. This community, college and industry-integrated approach increased access to apprenticeship training. Many participants, who were previously unemployed, secured employment. Fifty Indigenous participants received training.

Saskatchewan Polytechnic
Saskatchewan Polytechnic implemented a pilot project with both online and classroom components reaching 172 apprentices. Trades include construction electrician, plumber, heavy-duty equipment technician and truck and transport mechanic. Media rich learning resources, authentic content and regular self-assessments supported effective online course development. Online discussions and highly interactive learning with faculty combatted student isolation. Apprentices were assigned homework requiring them to ask their supervising journeyperson and employer questions reinforcing links between theoretical concepts and “real-world” examples.

Thompson Rivers University
Thompson Rivers University offered Level 3 and 4 integrated technical training with eight weeks online and 10 weeks on-campus. Twenty-five steamfitter/pipefitter apprentices completed the upper levels of their training in an accelerated manner. The online course included a variety of learning resources and interactive elements. Students could review Power Point lectures and YouTube videos. They could click on various parts of a “live” blueprint to learn about the different structures and pipes. Text pop-up boxes, animation and manoeuvring icons made the learning more engaging than reading PDF documents. Scrolling down too much on the screen was avoided. A “Blue Button” allowed instructors and students to see one another on screen like Skype and “live” sessions were hosted so apprentices could ask the instructor questions. Peer-to-peer discussion forums were set-up so the apprentices could learn from one another.

Yukon College
Yukon College offered online and onsite technical training to 34 Indigenous apprentices. Trades originally proposed included carpentry, electrical, plumbing and oil burner mechanical trades, but carpentry became the focus of the pilot. The training allowed new and existing apprentices living outside Whitehorse to complete their technical and theory training levels while staying in their communities. Supported by qualified instructors, experienced tutors, program coordinators and staff at the Yukon Government Apprenticeship Office, apprentices learned independently in a managed and self-paced environment. Instructors travelled to communities and worked on projects with individual apprentices and helped them prepare for online examinations.
4.0 METHODOLOGY

4.1 OVERVIEW

CAF-FCA answered the evaluation questions by analyzing these sources:

- 403 pre-and-post questionnaires from FIATT participants
- 548 survey responses from apprentices in block-release technical training
- 57 interviews with pilot administrators, apprentices and instructors

Descriptions of each source provide insight into how the information was collected.

4.2 QUESTIONNAIRE RESULTS

FIATT participants were invited to complete online pre-and-post questionnaires by the pilot administrators who provided the links in emails or embedded the links into their online courses. The online questionnaires were administered from October 2016 to May 2018 by a survey firm.

In total, 403 apprentices completed the questionnaires. The CAF-FCA questionnaires were completed by 332 apprentices. These responses were supplemented by 39 responses from Thompson Rivers University and 32 apprentices from BCIT who completed questionnaires with the CAF-FCA questions plus institution-specific questions. NBCC and Portage College did
not obtain completions. BCIT, NSCC and Red Deer College did not obtain post-questionnaire completions. Collège Boréal and Lambton College started their project later so no apprentices from these institutions completed the questionnaires.

The majority of the apprentices completing the questionnaires were from OETIO and Saskatchewan Polytechnic. These apprentices either completed their Level 1 or achieved certification so their success may have contributed positively to their responses. The Level 1 apprentices may have been positive about their experiences because they had not completed any other form of technical training and had no basis for comparison. Apprentices pursuing other levels could compare their experiences in alternate delivery to their previous experiences in block-release. Recruitment was an issue for most of the pilots suggesting the majority of apprentices still prefer block-release.\(^5\)

Apprentices who completed the questionnaires worked as mobile and tower crane operators (125 responses\(^6\)), construction electricians (81 responses), plumbers, steamfitters and gasfitters, (71 responses) and heavy-duty equipment technicians (44 responses). Fifty-one apprentices were from “other” trades.\(^7\)

All apprentice levels were represented in the questionnaire results. There were 127 Level 1 apprentices, 48 Level 2 apprentices, 92 Level 3 apprentices and 70 Level 4 apprentices.

Respondents self-identified as Indigenous (N=37), visible minority (N=20), internationally trained (N=13) and persons with disabilities (N=8). Fifteen women completed the questionnaires. Eighteen participants were from remote or Northern areas.

**FIGURE 1:** The Number of FIATT Participant Questionnaire Responses

<table>
<thead>
<tr>
<th>Training Institutions</th>
<th>Pre-Questionnaire Responses</th>
<th>Post-Questionnaire Responses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCIT</td>
<td>32</td>
<td>NA</td>
<td>32</td>
</tr>
<tr>
<td>Collège Boréal</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Lambton College</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>NBCC</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>NSCC</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>OETIO</td>
<td>92</td>
<td>45</td>
<td>137</td>
</tr>
<tr>
<td>Portage College</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Red Deer College</td>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Saskatchewan Polytechnic</td>
<td>105</td>
<td>69</td>
<td>174(^4)</td>
</tr>
<tr>
<td>Thompson Rivers University</td>
<td>20</td>
<td>19</td>
<td>39</td>
</tr>
<tr>
<td>Yukon College</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td><strong>All Institutions</strong></td>
<td><strong>268</strong></td>
<td><strong>135</strong></td>
<td><strong>403</strong></td>
</tr>
</tbody>
</table>

---

5. Most online pilots allow participants to self-select so there is no evidence to indicate how apprentice learners, who are not motivated to participate in online training, would fare in terms of their grades and their attitudes towards the online learning experience.

6. Some apprentices completed both the pre-and-post questionnaires so the number of responses does not represent separate individuals.

7. “Other” includes trades such as baker, boilermaker, cook, glazier, landscape horticulture and tool and die maker.

8. Saskatchewan Polytechnic had 172 participants, but some participants completed more than one level during the pilot project. They completed the questionnaire for each different level. As a result, the number of questionnaires completed is higher than the number of participants.
4.3 BASELINE SURVEY RESULTS
For comparative purposes, a baseline survey was completed with 548 apprentices in block-release technical training. Apprentices who are members of the Apprentices in Canada ePanel completed the survey online from November 2016 to March 2017. An online survey link was also distributed to instructors and apprenticeship administrators who shared it with apprentices.

The block-release survey had respondents from every province and territory in Canada, except Nunavut. The majority of the respondents were from Ontario (N=222) and British Columbia (N=159).

Respondents self-identified as visible minority (N=56), Indigenous peoples (N=27), persons with disabilities (N=20) and internationally trained (N=16). Sixty-seven women completed the survey. Thirty-six respondents identified they were from a remote or Northern area.

FIGURE 2: Baseline Survey of Apprentices in Block Release Training Completions, by Province and Territory

<table>
<thead>
<tr>
<th>Province</th>
<th># of Respondents</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario</td>
<td>222</td>
<td>41%</td>
</tr>
<tr>
<td>British Columbia</td>
<td>159</td>
<td>29%</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>56</td>
<td>10%</td>
</tr>
<tr>
<td>Alberta</td>
<td>35</td>
<td>6%</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>34</td>
<td>6%</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>17</td>
<td>3%</td>
</tr>
<tr>
<td>Yukon</td>
<td>9</td>
<td>2%</td>
</tr>
<tr>
<td>Manitoba</td>
<td>7</td>
<td>1%</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>5</td>
<td>1%</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>2</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Northwest Territories</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Quebec</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td><strong>Canada</strong></td>
<td><strong>548</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Note: Percentages may not sum to 100% due to rounding
4.4 INTERVIEWS

Fifty-seven interviews were completed with pilot administrators (N=19), instructors (N=16), an employer (N=1) and apprentices (N=21). The interviews were conducted from September 2017 to March 2018 over the telephone or in-person based upon contacts provided by the pilot administrators. In November 2017, CAF-FCA talked with instructors and administrators at BCIT and pilot administrators, an instructor, an IT specialist and a cohort of apprentices at Thompson Rivers University.

FIGURE 3: Number of Interview Participants

<table>
<thead>
<tr>
<th>Institution</th>
<th>Administrators</th>
<th>Instructors</th>
<th>FIATT Apprentices</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCIT</td>
<td>1</td>
<td>6</td>
<td>NA</td>
<td>7</td>
</tr>
<tr>
<td>Collège Boréal</td>
<td>1</td>
<td>NA</td>
<td>NA</td>
<td>1</td>
</tr>
<tr>
<td>Lambton College</td>
<td>1</td>
<td>NA</td>
<td>NA</td>
<td>1</td>
</tr>
<tr>
<td>NBCC</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>NSCC</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>OETIO</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Portage College</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Red Deer College</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Saskatchewan Polytechnic</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Thompson Rivers University</td>
<td>5</td>
<td>2</td>
<td>9</td>
<td>16 plus one employer for a total of 17</td>
</tr>
<tr>
<td>Yukon College</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19</strong></td>
<td><strong>16</strong></td>
<td><strong>21</strong></td>
<td><strong>57</strong></td>
</tr>
</tbody>
</table>
5.1 APPRENTICE EXPERIENCES AND PERCEPTIONS: QUESTIONNAIRE, SURVEY AND INTERVIEW RESULTS

5.1.1 Overview

CAF-FCA compared the survey and questionnaire findings to better understand whether alternate delivery reduced financial and non-financial barriers for apprentices.\(^9\) For some themes, interview (N=57) findings provide additional qualitative insights.

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\(^9\) CAF-FCA’s textual analysis focuses more on the actual experiences of block-release apprentices and the post-questionnaire FIATT apprentices, not on the pre-questionnaire responses, which capture what apprentices anticipated would happen. Pre-questionnaire responses are provided in the charts for reader reference.
### FIGURE 4: A Comparison of Block-Release and FIATT Apprentice Responses

<table>
<thead>
<tr>
<th>Variable</th>
<th>Block Release Apprentices</th>
<th>Pre-Questionnaire FIATT Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Respondents</td>
<td>548</td>
<td>116</td>
</tr>
<tr>
<td>All Institutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Relocated</td>
<td>21%</td>
<td>43%</td>
</tr>
<tr>
<td>Average Time Away from Home</td>
<td>13 Weeks</td>
<td>5.5 Weeks</td>
</tr>
<tr>
<td>Cost of Relocation</td>
<td>$3,129</td>
<td>$2,000</td>
</tr>
<tr>
<td>Flexible Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Flexibility of Training</td>
<td>60%</td>
<td>73%</td>
</tr>
<tr>
<td>Earnings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Work Hours Missed</td>
<td>398</td>
<td>207</td>
</tr>
<tr>
<td>Average Earnings Missed</td>
<td>$7,914</td>
<td>$4,846</td>
</tr>
<tr>
<td>Attitudes Towards Technical Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to Learn at One’s Own Pace</td>
<td>50%</td>
<td>74%</td>
</tr>
<tr>
<td>Access to Learning Supports</td>
<td>75%</td>
<td>76%</td>
</tr>
<tr>
<td>Access to Tools</td>
<td>71%</td>
<td>82%</td>
</tr>
<tr>
<td>Instructor Access</td>
<td>85%</td>
<td>85%</td>
</tr>
<tr>
<td>Skills Development</td>
<td>72%</td>
<td>75%</td>
</tr>
<tr>
<td>Appropriate Blend of Learning Methods</td>
<td>79%</td>
<td>79%</td>
</tr>
<tr>
<td>Number of Weeks on EI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time on EI</td>
<td>9.2 Weeks</td>
<td>79 Weeks</td>
</tr>
<tr>
<td>EI Received</td>
<td>$3,598.24</td>
<td>$2,108.12</td>
</tr>
</tbody>
</table>

10 Percentages in the chart represent the combination of the “strongly” and “somewhat” agree responses. Money amounts are based upon apprentice’s own estimates.
5.1.2 Earnings

Apprentices often experience financial challenges when they leave work to pursue technical training. Although they may qualify for EI, the amount received does not replace their wages. Alternate delivery approaches reduce the financial burden on the apprentice because they miss less work. Block-release apprentices missed an average of 398 hours due to technical training while post-questionnaire FIATT apprentices missed 207 hours. Block-release apprentices estimated they were unable to earn $7,914 while FIATT apprentices estimated forgone earnings totalling $4,846.

**FIGURE 5:** Average Hours of Work and Earnings Missed due to Technical Training

<table>
<thead>
<tr>
<th>Variable</th>
<th>Block-Release Apprentices</th>
<th>Post-Questionnaire FIATT Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average # of Hours Missed due to Technical Training</td>
<td>398</td>
<td>207</td>
</tr>
<tr>
<td>Average Earnings Lost due to Missing Work</td>
<td>$7,914</td>
<td>$4,846</td>
</tr>
</tbody>
</table>

5.1.3 Reduced Demands on EI System

FIATT and block-release respondents\(^{11}\) both reported receiving EI while at technical training (65 and 73 per cent).\(^ {12}\) Similar percentages of apprentices did not receive EI (26\(^ {13}\) and 27 per cent\(^ {14}\)). Alternate delivery did reduce the demand for EI. Block-release apprentices reported being on EI for 9.2 weeks and receiving $3,598.24. FIATT apprentices spent 7.9 weeks on EI and earned $2,108.12.

5.1.4 Reduced Rates of Temporary Relocation

A higher number of FIATT apprentices relocated, but they did so for fewer weeks and spent less money compared to block-release apprentices. Forty per cent of pre-questionnaire and 43 per cent of post-questionnaire FIATT apprentices relocated compared to 21 per cent of block-release apprentices. FIATT apprentices were away for 5.5 weeks compared to 13 weeks for block-release apprentices. Block-release apprentices estimated they spent $3,129 relocating while FIATT apprentices spent $2,000.

Apprentices who were interviewed liked staying at home for a longer period. For parents with young children, the stress on their families was reduced and they benefitted from their personal support systems. Instructors and pilot administrators said Indigenous trainees appreciated the positive reinforcement they received from their elders, community members and families. The Indigenous student cohorts who trained together became a support system for one another when they moved on-campus.

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\(^{11}\) N=75
\(^{12}\) N=391
\(^{13}\) N=138
\(^{14}\) N=31
FIGURE 6: Respondents who Relocated to Pursue Technical Training

<table>
<thead>
<tr>
<th>Variable</th>
<th>Block Release Apprentices</th>
<th>Post-Questionnaire FIATT Apprentices</th>
<th>Pre-Questionnaire FIATT Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of all Respondents</td>
<td>21%</td>
<td>43%</td>
<td>40%</td>
</tr>
<tr>
<td># of Respondents who Moved or Temporarily Relocated</td>
<td>115</td>
<td>50</td>
<td>86</td>
</tr>
<tr>
<td># of Respondents who Moved or Temporarily Relocated Outside their Province or Territory</td>
<td>15</td>
<td>2</td>
<td>NA</td>
</tr>
<tr>
<td>Time Away from Home</td>
<td>13 Weeks</td>
<td>5.5 Weeks</td>
<td>NA</td>
</tr>
<tr>
<td>Average Cost of Relocation</td>
<td>$3,129</td>
<td>$2,000</td>
<td>NA</td>
</tr>
</tbody>
</table>

5.1.5 Perceived Flexibility of Training

Post-questionnaire apprentices “strongly” (31 per cent) or “somewhat” (42 per cent) agreed the training was flexible to their needs (73 per cent overall) compared to 24 and 36 per cent of block-release apprentices (60 per cent overall).

In an institution specific survey administered by Thompson Rivers University, most students preferred the flexible format and would consider doing additional training online.

FIGURE 7: Perceived Flexibility of Technical Training

<table>
<thead>
<tr>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block-Release Apprentices</td>
</tr>
<tr>
<td>Post-Questionnaire FIATT Apprentices</td>
</tr>
<tr>
<td>Pre-Questionnaire FIATT Apprentices</td>
</tr>
</tbody>
</table>
5.1.6 Ability to Learn at One’s Own Pace

FIATT apprentices were more likely to agree they learned at their own pace during technical training. Seventy-four per cent of post-questionnaire apprentices either “strongly” (32 per cent) or “somewhat” (42 per cent) agreed they learned at their own pace. Block-release apprentices were less likely to support this statement (50 per cent overall) with only 19 per cent “strongly” and 31 per cent “somewhat” agreeing. The format of the learning may have impacted the responses. Apprentices in a self-paced, online learning environment took as much time as they needed when reviewing the material. Other pilot participants received one-on-one personalized support from instructors. In contrast, the pace in the classroom is determined by the teacher and the other students.

Some apprentices liked working at their own pace while others found it difficult. Many of the apprentices who were interviewed identified themselves as “self-starters” who were comfortable learning on their own. They recognized online learning would not work for everyone. Students liked reviewing the course material and processing it at their own speed. If they were confused by a term or a concept, they had the time to search the web for an additional explanation and then go back to the course material. One instructor commented, “Students were able to take control of their own learning experience, which led to more in-depth learning on the subjects that mattered to them most.” Students could ask questions about the specific areas they were struggling with. They also had the opportunity to re-take practice quizzes. In some cases, these quizzes were available to the students until they passed their journeyperson examination. One instructor felt online learning made the students more self-reliant when investigating and solving problems. Other participants felt working and studying at the same time was too difficult. They decided they needed more time to study. Some took vacation days in order to complete their online assignments and others, who were working at camps, did the work during their two weeks off. Some apprentices struggled to keep up with all of their assignments.

**FIGURE 8:** Ability to Learn at One’s Own Pace
5.1.7 Access to Learning Supports

Both apprentice groups felt they had access to learning supports. Seventy-six per cent of post-questionnaire apprentices either “strongly” (39 per cent) or “somewhat” agreed (37 per cent) and 75 per cent of block-release apprentices either “strongly” (38 per cent) or “somewhat” agreed (36 per cent).

**FIGURE 9: Access to Learning Supports**

<table>
<thead>
<tr>
<th>Responses</th>
<th>Block-Release Apprentices</th>
<th>Post-Questionnaire FIATT Apprentices</th>
<th>Pre-Questionnaire FIATT Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>38%</td>
<td>39%</td>
<td>50%</td>
</tr>
<tr>
<td>Somewhat Agree</td>
<td>36%</td>
<td>37%</td>
<td>35%</td>
</tr>
<tr>
<td>Neither Agree nor Disagree</td>
<td>10%</td>
<td>18%</td>
<td>4%</td>
</tr>
<tr>
<td>Somewhat Disagree</td>
<td>4%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>7%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Unsure</td>
<td>3%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

% of Respondents
5.1.8 Access to Tools

Apprentices were asked about their access to tools. Tools were defined as implements to complete trades work, not learning tools. Eighty-two per cent of post-questionnaire respondents either “strongly” (40 per cent) or “somewhat” (42 per cent) agreed they had access to tools. Seventy-one per cent of block-release apprentices either “strongly” (38 per cent) or “somewhat” (33 per cent) agreed. A large number of mobile crane operators completed the questionnaires. Their access to the state-of-the-art simulators may have positively influenced their responses to this question.

FIGURE 10: Access to Tools
5.1.9 Access to Instructors

Combating the isolation learners typically experience when learning online was a goal for many pilots. “Live” sessions, online discussion forums, texting and Skype supported apprentice-instructor interaction. Both post-questionnaire and block-release apprentices agreed they had access to teachers (85 per cent for both groups). Block-release apprentices were more likely to “strongly” agree than post-questionnaire apprentices (55 versus 49 per cent). In an institution specific survey administered by Thompson Rivers University, most respondents agreed they learned a lot during the “live” sessions with the instructor and during the online discussion forums.

Pilot participants said they liked how their instructors provided one-on-one help and went through difficult problems step-by-step. One apprentice said, “…through FIATT I had the opportunity to use learning materials online, which were very user-friendly. I was able to reach my instructor via email, text or phone any time of day. He was a great help.” Instructors also felt apprentices benefitted from the one-on-one attention provided.

Most of the questionnaire respondents were from OETIO or Saskatchewan Polytechnic. The set-up of the pilots and the engagement strategies utilized help explain the positive responses. OETIO apprentices were at the training centre learning on simulators so their time with the instructors was not reduced. Online discussions between the Saskatchewan Polytechnic apprentices and the instructors facilitated group cohesiveness. Students and instructors posted photos and biographies of themselves. As a part of the peer and class online forums, they socialized and shared insights from their unique workplaces. According to the instructors, the online engagement enhanced the on-campus learning environment. While in class, students were more supportive and less nervous to speak in front of the group because they had already bonded online.

**FIGURE 11: Access to Instructors**

![Bar chart showing responses to access to instructors](image)
5.1.10 Grades

Pilot participants reported receiving higher grades than those in block-release indicating the alternate delivery format did not negatively impact apprentice performance. Ninety-five per cent of pre-questionnaire apprentices identified they received mostly As (62 per cent) or Bs (33 per cent) during their last technical training level. Post-questionnaire apprentices reported earning even higher grades with 99 per cent identifying they earned mostly As (78 per cent) or Bs (21 per cent). Eighty-six per cent of block release apprentices received As (64 per cent) or Bs (22 per cent).

Two pilot administrators reported there were no significant differences in exam scores between pilot participants and block-release students. One pilot administrator observed that the online students achieved grades one to eight per cent higher than the block-release students and another pilot administrator said the grades were four to five per cent higher. One pilot administrator felt online courses were more standardized resulting in more consistent results.

FIGURE 12: Grades Received During Most Recent Level of Technical Training

15 The grades apprentices reported could not be verified against their actual marks due to privacy concerns.
5.1.11 Skills Development

An evaluation question asked about whether the pilots prepared participants to work in the trades. Compared to their other responses, both groups were less likely to agree they were developing the skills required to succeed in the trades. Seventy-five per cent of post-questionnaire apprentices either “strongly” (38 per cent) or “somewhat” (37 per cent) agreed and 72 per cent of block-release apprentices either “strongly” (33%) or “somewhat” (39%) agreed. It is unclear whether apprentices sought more technical, soft or essential skills.

Most apprentices felt prepared when they entered the classroom following their online course work, but instructors were divided about the skills development of pilot participants compared to their peers in block-release programs. Instructors and pilot administrators from one pilot said their online participants had a deeper understanding of the theoretical material because they applied the knowledge at the workplace as they learned it. For difficult concepts, instructors were able to add videos and self-assessment tools that helped the students review the material and test their knowledge online. Rather than trying to compress the content into one class, online students had the option to go back and review basic concepts before progressing to the more challenging material. One instructor thought the format worked well for the students and when they came to class he observed, “Students were more interested in what was happening in the class and were keen to gain new skills. They weren’t bored.” Instructors from another pilot thought less time in the lab impaired the skills development of the online students. These instructors thought offering apprentices more lab time on the weekends would help them improve their skills.

FIGURE 13: Developing the Skills Required to Succeed in the Trades
5.1.12 Appropriate Blend of Learning Methods

Both groups felt the appropriate blend of learning methods were used during technical training (79 per cent for both groups). The same percentages of post-questionnaire and block-release apprentices “strongly” (37 per cent) or “somewhat” (42 per cent) agreed.

**FIGURE 14:** Appropriate Blend of Learning Methods

![Bar chart showing responses to the question about the appropriate blend of learning methods.](chart.png)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Block-Release Apprentices</th>
<th>Post-Questionnaire FIATT Apprentices</th>
<th>Pre-Questionnaire FIATT Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>37%</td>
<td>48%</td>
<td>37%</td>
</tr>
<tr>
<td>Somewhat Agree</td>
<td>42%</td>
<td>42%</td>
<td>37%</td>
</tr>
<tr>
<td>Neither Agree nor Disagree</td>
<td>7%</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>Somewhat Disagree</td>
<td>8%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>4%</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>Unsure</td>
<td>3%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>
Pilot Participation: **Benefits for Apprentices**

Apprentices who participated in the FIATT project identified these benefits:

- less time away from family and friends
- access to training without being on a waitlist
- missing less work
- reduced or no relocation costs
- being able to progress or complete training without relocating to the city

Apprentices agreed they would recommend the online training option to other upper level apprentices. Some apprentices felt Level 1 and 2 technical training should be pursued on-campus because hands-on help from the instructor and math and science upgrading is needed at that stage. Apprentices identified what they liked about learning online:

- learning at your own pace and completing the work based on your own schedule
- accessing an easy-to-navigate learning management system and a variety of learning resources, including videos
- receiving instructor prompts and reminders to stay-on-track

When asked what they missed about block-release training, apprentices agreed it was the in-person peer-to-peer interaction and networking.

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Pilot Participation: **Benefits for Colleges**

The pilot administrators felt participation in the FIATT project provided these benefits:

- helped institutions develop frameworks and models which can be used when creating online courses for other trades and levels
- provided an opportunity to create interactive online trades-focused content
- built instructor capacity to teach online and connected trades instructors and IT staff in multiple departments
Pilot Participation: **Benefits for Instructors**

Instructors derived these benefits from participating in FIATT:

- flexible schedule
- ability to provide input into new teaching methods and technology
- opportunities to work in collaboration with other schools

Instructors identified needed supports:

- presentations so faculty can learn about online learning and its potential positive impacts for students and colleges
- additional funding so instructors can access training and online support workshops
- more opportunities to teach as a part of a team
- greater collaboration and sharing amongst institutions with the potential for teaching courses in the same trades together

Pilot Participation: **An Employer’s Perspective**

An employer in the construction ICI mechanical sector thought alternate delivery was beneficial because there was reduced time away from the workplace. He did not observe any skills differences between block-release and alternate delivery apprentices. He felt both methods should continue to be offered. Based on his experience, the employer thought alternate delivery made it easier for him to participate in apprenticeship training, especially when trade programs are not offered locally. He would recommend alternate delivery to other employers. The employer would like to see more funding for student services as a way to help apprentices.
Pilot administrators and instructors shared their best practices so other trainers may benefit when implementing their own alternate delivery programs.

6.1 INVOLVE FACULTY IN PROGRAM DEVELOPMENT AND BUILD INSTITUTIONAL CAPACITY

Support from institutional leaders is required to make alternate delivery initiatives successful. When leaders support departments working together, internal capacity within the institution is built and relationships among the departments are established. Colleges offering online courses in the same trades should share information and leaders need to make connections with other institutions.

Trades instructors must be open to working collaboratively with other instructors and IT specialists. When first learning about how to teach online, one pilot administrator said instructors require six months of professional development.
OETIO offered instructors after hours simulator training allowing instructors to learn all about the various simulators. Instructors identified what they liked and disliked about each simulator contributing to the product selection process. The initial skepticism towards simulators was overcome once the instructors used the simulators themselves and then observed apprentices using them. The FIATT pilot inspired the union to include a simulator wing at its new training facility in Houston, Texas.

6.2 ENCOURAGE EMPLOYER INVOLVEMENT AND INDUSTRY VALIDATION OF COURSE CONTENT

The pilot administrators said gathering employer feedback was an important way to validate the training content ensuring up-to-date industry practices were reflected in the lectures, activities and videos. Employers from a mix of industries, regions and unionized and non-unionized workplaces were invited to provide feedback by attending one-on-one consultations, multi-day workshops and steering committee meetings. Once employers understood the content and the alternate delivery approach, some pilot administrators found employers were keen to offer their apprentices space so they could continue with their training. Employers appreciated the fact the apprentices did not need to leave the workplace for as long.

Best Practice Example

NSCC facilitated a two-day interactive faculty meeting for electrical instructors to design simulator prototypes. Over the course of the project, three additional faculty meetings occurred supporting relationship building and information sharing within the department and across the province. NSCC worked with faculty subject matter experts to create web-based videos for the online courses. Input from the instructional designer and Manager of Apprenticeship was also gathered. By collaborating, the project team and faculty enhanced the learning resources throughout the project.

Best Practice Example

Saskatchewan Polytechnic included the At Your Workplace module in their online courses. Apprentices were asked questions about workplace practices and encouraged to ask their journeyperson mentors, employers and work colleagues for input. Apprentices then shared “real-world” examples with their instructors and peers about how the course content applied to their unique workplace. The online discussions kept instructors up-to-date about industry practices. Instructors shared this information with other faculty and program administrators enhancing the department’s overall knowledge. By answering apprentice questions, employers and journeypersons developed a better understanding of technical training content. The pilot administrator thought the online learning format enhanced skills development because apprentices learned theoretical concepts online and then applied their knowledge at the workplace.
6.3 SUPPORT APPRENTICE PROGRESSION

Structuring learning management systems appropriately helps instructors monitor student participation and supports online course completion. The time spent by the students on the courses was tracked and instructors could observe in “real-time” how students approached the material gaining insights into each student’s learning style and habits. The learning management systems provided analytics comparing the performance of individual students with their cohort. The instructors would prompt students with reminders when they were falling behind. One instructor texted and emailed certain students almost daily to ensure the students completed the online modules and assignments. Apprentices had a set time to complete each module. One instructor said it was important to stop during live lectures and ask if the students had any questions. Although some apprentices did not like how the learning management systems required them to repeat tests if they did not score above 80 per cent, one instructor felt re-taking the test was important because “it helps them learn, and validates that they actually read and retained the content.” When studying online, apprentices said weekly deadlines, tips about good studying habits and math refresher courses were helpful.

Best Practice Example

The Thompson Rivers University trades department benefitted from its connection to the Open Learning Centre when implementing its pilot. Experienced online content specialists helped the instructor, who had never taught an online course before, navigate the Moodle learning management system. The IT specialist worked closely with the instructor to make the learning interactive in an online environment. Time management and study tips, advice about staying motivated and strategies for success in an online learning environment were provided to apprentices. Peer forums facilitated the feeling of a cohort and helped create peer-to-peer pressure to move forward in the course. Reminders were sent out outlining what should be accomplished by the end of the week. The instructor reviewed the online course analytics to better understand student performance and the analytics were used to improve the course material. When students spent a long time in one section, the instructor adjusted the content to make it easier to understand and/or he created an additional assignment so students could practice their skills. The instructor reviewed how the students did on their practice exams, provided help in problem areas and added extra quizzes. On-campus, students were provided iPads and continued to use the online learning resources in the classroom. Block-release apprentices also had access to Moodle as an additional learning tool. Thompson Rivers University shared its material with other institutions because it has a Creative Commons license. Creatives Commons is a repository for online content and is a useful resource when developing online courses.16

16 Thompson Rivers University must be acknowledged when the material is used and the user cannot earn a profit.
6.4 ESTABLISH PARTNERSHIPS

Pilot administrators emphasized the importance of establishing partnerships with First Nations when implementing alternate delivery pilots. They outlined these best practices:

- **Visit communities before developing programs:**
  A respectful and responsive approach requires going to the community, listening to the community members and integrating their feedback into the training approach. Administrators said visiting the communities prior to developing any program content was important. Administrators then continued to visit the community throughout the project. As one pilot administrator said, “Presence is important. Presence is being there. It’s being open to asking, ‘How would you do this? How can we help your students?’ It’s about saying, ‘We are in this together.’”

- **Delegate participant and journeyperson recruitment to First Nations:**
  First Nation governments are best positioned to identify community members suited for alternative delivery training and journeyperson mentors.

- **Include non-academic programming delivered by the First Nation:**
  Training within the community must be supplemented by First Nation-led activities such as community lunches, elder visits and counselling sessions.

- **Hire community liaison support staff to co-ordinate program delivery:**
  Employing a part-time liaison staff person facilitated positive relationships between the institutions and the First Nations. The staff person co-ordinated with multiple First Nation governments and helped the students with transportation, accessing social assistance and finding job placements. Transportation, in particular, was a huge issue. By providing rides and money for gas, the liaison staff person facilitated pilot participation.

**Best Practice Example**

In the Red Deer College and Yukon College pilots, First Nation governments were involved in the program development and delivery. They played an important role in recruiting participants. Elder participation fostered community support for the pilots and encouraged the apprentices to take extra pride in their skills development and training. When training within their own communities, participants benefitted from their personal support systems. Ongoing communication with First Nation partners remained important throughout the pilots.
Pilot administrators and instructors reflected upon their challenges when implementing the pilots. A pilot administrator suggested there should be more time between each cohort to reflect upon lessons learned and make the required adjustments.

7.1 COLLABORATE WITH PROVINCIAL AND TERRITORIAL APPRENTICESHIP AGENCIES

Pilot administrators advised consulting with the provincial and territorial apprenticeship authorities prior to pilot development. Some pilot administrators experienced difficulties obtaining provincial approval for their pilot programs after they received FIATT funding. Provincial administrators were reluctant to approve new seats for technical training when other institutions were laying-off instructors. Other pilot programs only received partial approval. Understanding provincial/territorial training and curriculum requirements from the beginning is important. Provincial/territorial apprenticeship administrators should be included as project partners.
Unique situations required working in collaboration with provincial/territorial administrators. In the Yukon, experienced tradespeople living in a First Nation community may not have their certification. The First Nation is the employer sponsor for the apprentices, but they do not have enough certified individuals to mentor the apprentices. The pilot administrators worked with territorial administrators and First Nations ensuring special agreements were signed so experienced tradespeople could work with the apprentices. Journeypersons also returned to the community to train apprentices. All parties worked together enabling more apprentices to access training within the First Nations community.

Other government departments may play a role in overcoming barriers related to financial supports. For Indigenous learners, age limits prevented access to upgrading and funding did not align with the pilot timelines. Consequently, individuals interested in apprenticeship training could not participate in the pilots.

7.2 SPEND TIME ON PROGRAM DEVELOPMENT AND SECURE BUY-IN FROM INSTRUCTORS AND EMPLOYERS

The pilot administrators agreed more time should be allotted for program development because that is the most complex and costly part of alternate delivery. Administrators noted it was time consuming obtaining approvals, securing buy-in and acquiring and developing the necessary resources required for pilot implementation. Ensuring subject matter experts and dedicated staff resources are available is crucial to learning resource development. When partnering with another institution, bi-weekly meetings during the program development phase followed by monthly meetings are required. Pilot administrators agreed the staff implementing alternate delivery initiatives should be familiar with apprentice scheduling and delivery and should have established relationships with the provincial/territorial apprenticeship administrators.

Some pilot program administrators had difficulty obtaining buy-in from instructors. Two administrators said convincing faculty to participate required a significant amount of time and effort. There was a lack of knowledge about alternate delivery mechanisms and a shift from current perceptions and practices to a new way of thinking about teaching was required. Instructors required evidence that alternate delivery mechanisms could support apprentice skills development. The consultation sessions and information workshops for faculty should be included in the project schedule. Faculty members who did teach online at times felt isolated from their colleagues who remained skeptical about online delivery so ongoing faculty engagement is required.
Some employers had reservations about participating in the pilots and employers were not as involved as some of the pilot administrators originally anticipated. Time to explain the alternate delivery initiative and its advantages was required. Although the pilot administrators wanted to create greater links between technical training and workplace learning, some employers were reluctant to participate in live broadcasts because recording onsite would infringe upon proprietary contracts.

7.3 CONSIDER APPRENTICE RECRUITMENT CHALLENGES

Several pilot administrators reported lower than expected participant uptake. Some program administrators said they overestimated the number of apprentices who would be interested in participating and advised consulting with apprentices first to assess their level of interest. Free tuition or bypassing waitlists were incentives provided to encourage participation. Multiple institutions attributed their low uptake to choosing small trades with limited apprentice numbers and suggested choosing larger trades. What constitutes a large trade may differ amongst jurisdictions and local labour market conditions must be considered.

One pilot administrator asked his institution’s apprentices why they did not want to participate. Apprentices said they value their time at technical training for dedicated studying and learning. Working all day and then completing online course work at night did not appeal to them. One pilot administrator commented, “Employers and apprentices are familiar with tried and tested methods. Any new method requires risk for all stakeholders and apprentices are not prepared to take the risk.” The administrator suggested a nation-wide marketing campaign would be required to promote new models of learning to employers and apprentices.

In First Nations communities, building relationships and creating awareness about training opportunities takes time impacting project timelines. Administrators observed that by the time excitement was generated in the community about the pilot, the project was nearing completion.

7.4 ENHANCE CONNECTIVITY AND BUILD CAPACITY IN REMOTE AND RURAL COMMUNITIES

Pilot administrators observed many rural and remote communities in Canada still have limited internet access and the inconsistent connections complicated project administration and communication. Accessing online training was difficult for apprentices working at remote worksites. The facilities at camps had a limited number of shared computers and internet connections were sporadic. When apprentices cannot easily download videos and access the interactive elements of the courses, the learning is less engaging and the technical difficulties cause frustration. Simulators required an internet connection to receive software updates and upload student information. When the simulators lost their connection, student performance data was lost making it difficult to track student progress. Expanding online learning in rural and remote communities will be difficult unless the internet connections are improved.
Small, remote communities also lack human resources and facilities. First Nations can help by reaching out to past members who are journeypersons and encouraging them to come back to the community and mentor apprentices. These journeypersons build a community’s capacity to train. They take on a leadership role when mentoring apprentices and create a sense of pride in the community. Remote communities face additional challenges because they may not have suitable buildings, supplies and equipment for setting up classrooms or labs. Maintenance was an issue and some of the buildings had no heat and the water was not safe to drink. Harsh weather conditions constrained travel plans and training schedules.

7.5 BE PREPARED TO ADDRESS ESSENTIAL SKILLS AND EMPLOYABILITY GAPS

Pilot administrators noted that academic upgrading and tutoring may be required and should be included in project costs and timelines. At the beginning of the project, administrators advised assessing all the students so skills and knowledge gaps are identified and addressed prior to training. Administrators and instructors observed that Indigenous learners had less experience in the classroom and paying attention in class and multiple-choice test formats posed challenges. One instructor found progressing through the curriculum was more difficult than in a standard block-release class. Participants experienced difficulty passing trade entry and technical training exams. Tutoring focused on preparing for and writing exams should be provided. Training institutions played an important liaison role in navigating the apprenticeship system for apprentice learners ensuring they accessed the appropriate supports, overcame barriers and progressed.

Many participants had limited or no experience working outside their community and struggled with time management and punctuality during their work placements. In-person job coaching is required for Indigenous learners when transitioning from learning within a First Nations community to an on-campus college environment. In order to accommodate and appropriately prepare students, alternate delivery models may extend the training period, not shorten it.

7.6 BE AWARE OF LOGISTICAL ISSUES

It can be difficult to obtain technical help when implementing an online course because the IT department hours do not align with apprentice schedules. Logging in the first day can be an issue and clear login instructions must be sent to the students in advance, especially when no IT help is available in the evening. A checklist should outline for instructors what they should tell students about logging in the first day. Strategies for dealing with server crashes and poor internet connections may help apprentices avoid frustration. Instructors should get together and share “what works” when dealing with logistical matters in an online learning environment.
7.7 CONTINUE TO SEEK OUT THE MOST FLEXIBLE LEARNING TECHNOLOGIES

One pilot experimented with different software for the synchronous delivery of online courses. The pilot administrator noted it was difficult to find a program that met all instructor needs. Some platforms would support the presentation of Power Points and the use of whiteboards for question and answer responses, but did not easily support the integration of videos or animated Power Points. Institutions should continuously explore the latest learning platforms and available technologies such as 3D modelling so they can further improve their courses.

More durable simulators would help trainers offer training in remote geographical areas. When the equipment is moved and damaged, operational costs increase. Simulators with text in more languages would help train new immigrants and Indigenous peoples. OETIO’s union charter expanded into Nunavut and OETIO is examining whether or not to include the Inuktitut language in its simulators.

7.8 DEVELOP STRATEGIES TO VERIFY APPRENTICE KNOWLEDGE

When implementing online courses, there is no way to check who is completing the online work undermining the integrity of the quizzes and exams. Institutions may consider testing apprentices when they are on-campus in a supervised setting to verify their knowledge and understanding of the theoretical material.

7.9 CONSIDER ADDITIONAL COSTS

Collège Boréal noted translation costs were quite high, much higher than originally estimated, so it is important to consider these costs when developing a proposal. Recruiting French-speaking subject matter experts in the carpentry and heavy-duty equipment mechanic fields was not feasible for a three-year project so it made sense to complete the English course first and then translate the content. The pilot administrators concluded developing content in both languages takes more time and timelines should reflect this in future projects. The college did not have full-time faculty at their institution to assign to the project so part-time faculty were enlisted to help develop the content further extending the timelines.
Pilot administrators, instructors and apprentices identified required supports.

8.1 CONTINUE TO CREATE AWARENESS ABOUT TRAINING OPTIONS AND FINANCIAL INCENTIVES

- Greater awareness about technical training options, such as online learning, is required. Apprentices said they know labourers who do not pursue additional training because they do not know about the options available and assume pursuing technical training requires them to leave home.

- Creating awareness about apprenticeship educational requirements and the unique training options for First Nations within communities is required. When interest is generated through “word of mouth,” it is important there are still training opportunities available and ongoing support for successful initiatives is required.
Apprentices felt there was a lack of awareness about the incentives available. They would like clearer information about how to apply for the Canada Apprentice Loan and EI. Less confusion would be caused if there was one main contact. The unique nature of the FIATT pilots resulted in some apprentices not receiving EI because apprentices were defined as still working, even though they were at school. Apprentices agreed difficulties navigating the EI system detracted from their learning and clearer instructions about applying for EI should be provided.

8.2 SUPPORT INNOVATIVE AND CREATIVE APPROACHES TO TRAINING

- One institution said the requirement to define all activities in the contribution agreement limited their opportunities for innovation when addressing local needs. More flexibility may allow pilot administrators to be more creative in their training approaches.

- Government-funded projects should provide sufficient time for institutions to develop and implement their new training approaches.

- Institutions bringing training to rural, remote and Indigenous communities require specialized supports to establish meaningful partners, set-up internet connections and hire essential skills tutors.

- Apprentices would like to see more “real-world” examples, virtual reality and simulations in their online courses.

- The use of digital technologies should be maximized. For example, preloaded iPads with the textbooks and codebooks help apprentices clarify key terms and requirements at the workplace and in the classroom. Some Indigenous learners living in First Nation communities may require computers or smartphones so they can study and review content at home. Content should be accessible on smartphones and online courses and learning resources should be available to apprentices across the country.

- Alternate assessment methods may provide apprentices additional opportunities to demonstrate their skills and should be considered as a part of alternate delivery initiatives.

8.3 PROVIDE TRAINING FOR INSTRUCTORS

- Instructors said assistance from a community liaison staff person and cultural training would help them teach Indigenous learners more effectively.

- Some instructors cited difficulties when learning how to use the simulators and learning management systems. Additional training would help instructors.
8.4 PROVIDE DIGITAL AND ESSENTIAL SKILLS TRAINING FOR APPRENTICES

- Digital skills training should be offered so apprentices can improve their computer skills.
- Individuals require assessment opportunities so they can identify gaps and next steps.
- Trades math courses and essential skills training prepare Indigenous learners for apprenticeship opportunities and should be offered on an ongoing basis.
- When instructors are not available, access to tutors within First Nation communities may help Indigenous learners prepare for the trades entrance and certification exams.
- Academic upgrading aimed at experienced tradespeople in First Nation communities who wish to become certified is important. Increasing the number of qualified journeypersons within First Nation communities would help create a larger pool of apprentice mentors.

8.5 SIGN A MEMORANDUM OF UNDERSTANDING TO SHARE MATERIALS

- Interactive learning assignments and videos should be shared as widely as possible so limited resources can be maximized.

8.6 SUPPORT CO-ORDINATION AND INFORMATION SHARING AMONG STAKEHOLDERS

- Co-ordinated training approaches involving industry, training providers and provincial/territorial governments ensure new ideas are informed by past initiatives and the results are tracked and analyzed in a consistent manner. Any federal initiatives should examine carefully what provincial/territorial apprenticeship administrators are already doing.
- A group supporting innovation in teaching could be established so trades instructors can learn from one another and share content.
- Cross-collaboration and information sharing among training institutions is valuable. As one instructor commented, “Even with our great resources, it is always beneficial to share ideas with other training institutes and see what they have tried and how it is working for them…I believe there would be some benefit in establishing a [mechanism or venue] to share ideas.”
Best Practice Example

In Atlantic Canada, a three-year Memorandum of Understanding was signed to improve online training opportunities for apprentices on the east coast. Institutions will share existing online training and develop additional online courses and resources. Signatory institutions include College of the North Atlantic, Collège communautaire du Nouveau-Brunswick, Holland College, Collège de l’Île, NSCC, NBCC and Université Sainte-Anne. These colleges have more than 40 rural and urban campuses and train approximately 50,000 full and part-time students annually.
From 2015 to 2018, ten alternate delivery pilots were implemented across the country. The pilots reduced financial and non-financial barriers for participants. FIATT apprentices worked longer, paid less to relocate and required less EI. Although financial barriers for apprentices were reduced, offering alternate delivery does not decrease the institutional costs. Keeping up with the latest industry trends and learning technologies is expensive and a significant amount of instructor time is required. Institutions may obtain financial benefits if they broaden their use of alternative delivery, develop new efficiencies and take on more students, but during this project none of the pilots reported significant savings. Some institutions estimated it would take several years before alternate delivery would become cost effective for the institution because the student demand is limited.

Apprentice recruitment was a challenge and there were fewer participants and cohorts than anticipated. Although the broader appeal of alternate delivery may be limited, it works particularly well for specific groups. Parents, older individuals, rural and Northern residents and third and fourth year apprentices appreciated the flexibility the pilots afforded them and said they would not have progressed in their training without FIATT.

9.0 CONCLUSION
Alternate delivery attracts under-represented groups, especially when meaningful partnerships with First Nations communities are established and First Nations feel ownership over the training. For Indigenous learners who were unemployed and not connected to the post-secondary system, the pilots enabled them to access training and a work placement.

The pilots helped address the barriers associated with online learning such as the lack of interactivity and isolation. The online courses created by the colleges were highly interactive with animation, “live” blueprints and video content. Interactivity with the instructor was also facilitated with live sessions, texting and Skype. Participants thought the courses were easy-to-navigate and felt they had sufficient access to their instructors. While students commented positively about the supports they received from instructors and the interactivity helped overcome learner isolation, more widespread adoption of online learning may be difficult given the hours required and the challenges it poses for faculty and institution’s collective agreements. Pilot administrators agreed certain trades are more suited to online training than others and for some trades on-campus lab time for the apprentices is required.

The alternate delivery format, by allowing apprentices to work longer on-the-job, reduces impacts on workflow and leads to increased employer participation in apprenticeship, according to pilot administrators. The pilots facilitated greater connections between online learning and the workplace. Apprentices applied theoretical concepts they learned in the course to their workplace while employers gained a better understanding of technical training content. Institutions also benefitted by learning about the latest workplace trends.

Pilot administrators, apprentices and instructors identified best practices such as involving faculty in program development, encouraging employer involvement, supporting apprentice progression and establishing meaningful partnerships with First Nation communities.

Lessons learned included collaborating from the start with provincial and territorial apprenticeship administrators, facilitating faculty buy-in through consultation and information workshops, assessing apprentice interest, managing connectivity and capacity issues in remote and rural communities and addressing essential skills and employability gaps.

The FIATT pilots supported greater experimentation with alternate delivery in a variety of trades. These experiments highlighted the potential benefits for apprentice progression, completion, skills development and engagement with learning. Promising practices from the FIATT pilots will inform and shape future alternate delivery approaches and apprentice learning strategies.
FIGURE 15: Overview of FIATT Findings

<table>
<thead>
<tr>
<th>Main Evaluation Research Questions</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Are the pilots more likely to attract under-represented groups?</td>
<td>Yes</td>
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<tr>
<td>Do the pilots facilitate program progression and completion?</td>
<td>Yes</td>
</tr>
<tr>
<td>Do the pilots lead to enhanced employer participation and support for apprenticeship?</td>
<td>Yes³⁷</td>
</tr>
<tr>
<td>Do the pilots reduce impacts on workflow?</td>
<td>Yes³⁸</td>
</tr>
<tr>
<td>Do the pilots reduce demands on the EI system?</td>
<td>Yes</td>
</tr>
<tr>
<td>Do the pilots reduce education costs?</td>
<td>No</td>
</tr>
<tr>
<td>Do the pilots reduce non-financial and financial barriers for participants?</td>
<td>Yes</td>
</tr>
<tr>
<td>Do the pilots prepare participants to work in the trades?</td>
<td>Yes³⁹</td>
</tr>
</tbody>
</table>

17 A broader sample of employers would have to be consulted to further verify this finding.
18 A broader sample of employers would have to be consulted to verify this finding.
19 Although FIATT apprentices did feel they were developing skills required to succeed in the trades, there was less agreement compared to the responses for other questions.

The Impact of the FIATT Initiative

FIATT generated many positive outcomes:
- Curriculum and test bank questions were shared among institutions and provinces and territories.
- Interactive elements and videos were created for online trades courses making the learning more interactive and engaging.
- Online courses became more widely available to apprentices from across the country.
- Workshops engaged faculty from across the province in simulator development supporting collaboration among instructors. All faculty benefitted from the learning resources developed.
- Simulators enabled training institutions to offer larger classes during the winter when apprentices were not working. More apprentices were available for work in the spring accommodating employer hiring needs.
- Employers donated equipment to training institutions and validated training content.
- First Nations established partnerships with training institutions connecting their community members with the post-secondary education system. They accessed equipment, laptops and staff supports.
- Rural, Northern and Indigenous residents accessed training without leaving home.
- The development of French online learning materials facilitated engagement with Francophone students in Ontario.
- Relationships built with employers and First Nations may lead to future initiatives focused on employer sponsorship and career awareness.