



Rapid On-The-Job Employee
Upskilling / Re-Skilling for
In-Demand Skilled Jobs via
Work-Based Learning:
Higher Productivity, Retention, &
Career Pathways

Final Report | January 2024



WBLC
Work Based
Learning Consortium

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FSC is a forward-thinking centre for research and collaboration dedicated to preparing Canadians for employment success. We believe Canadians should feel confident about the skills they have to succeed in a changing workforce. As a pan-Canadian community, we are collaborating to rigorously identify, test, measure, and share innovative approaches to assessing and developing the skills Canadians need to thrive in the days and years ahead. The Future Skills Centre was founded by a consortium whose members are Toronto Metropolitan University, Blueprint ADE, and The Conference Board of Canada

The opinions and interpretations in this publication are those of the author(s) and do not necessarily reflect those of the Future Skills Centre or the Government of Canada.



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Introduction

Work-Based Learning

History

WBLC came to this project with a **proven, competencies-based, outcomes-driven methodology** – Work-Based Learning (WBL) – that we had built, delivered, and refined over 9 years of partnering with 60 advanced manufacturing companies in Ontario – mostly SMEs in aerospace, auto parts, plastics, tool/die/mold, automation, and others.

We partnered with these companies to jointly select, train, and certify over 600 of their employees (both new hires and upskills) of all ages and backgrounds for in-demand skilled jobs, such as CNC Machinists, Mold Maintenance Technicians, and Structural Airframe Assemblers.

This work included our Phase 1 Project with the Future Skills Centre (FSC), **Skilled Jobs & Career Pathways for Mid-Career Workers through Work-Based Learning** which focused on skilled workers aged 30 – 55 who needed to transition from their current at risk or redundant skilled job to an in-demand skilled job.

In this Phase 1 project, we partnered with the Canadian Association of Mold Makers to engage companies in mold manufacturing and/or mold maintenance as participants in developing and pilot testing the new WBL program for Mold Maintenance Technicians – an in-demand skilled job in the molding industry in Canada.

The overall success rate for all WBL Programs was over 90% and the time required (26 weeks for high-skill positions) was less than half what was typically required for informal on-the-job training (12 – 18 months). Employers gained the capable skilled workers they needed and the vast majority of the diverse jobseekers who were hired and trained for these skilled jobs would not have otherwise been able to acquire the necessary job-specific technical skills and knowledge to get hired and start on rewarding career pathways.

This Project

In this transformative project (Phase 2 with FSC), we intended to build systematic processes for identifying employer demand for upskilling/re-skilling employees + build and test new and enhanced ‘Rapid On-the-Job Upskilling’ Work-Based Learning programs for in-demand skilled jobs in diverse sectors and regions across Canada.

The major benefits of achieving these goals include:

- Reducing inequities within the labour market
- Enabling more open access to training by both employees and jobseekers, regardless of income, geography, and background
- Enabling employees to adapt to technological change
- Allowing ready access by employees to workplace-based skills training
- Enhancing the ability of immigrants to succeed in Canadian workplaces
- Greater Equity, Diversity, and Inclusion – all WBL processes are inherently supportive of EDI, since they are based on objective, evidence-driven, competencies-based methods



Project Objectives, Activities, and Outcomes

Project Objectives

In this project, we set several objectives to build on the proven successes of WBL Programs:

1. **Engage Other Sectors across Canada in WBL Programs:** Determine if this Work-Based Learning methodology was relevant and valuable for other sectors across Canada: could we faithfully follow the seven (7) essential principles that underpin Work-Based Learning while adapting to the work situations and the specific needs of four (4) skilled jobs in other sectors, such as renewable energy, and in other geographies, such as Alberta and the Maritimes? And could we find or build the remote assessment technology needed to conduct certification assessments anywhere in Canada?
2. **Achieve ‘Rapid Upskilling’ via WBL Programs:** Reduce the training time for three (3) existing WBL programs, such as CNC Machinist [Level 1], by 40% - 50% while ensuring that all trainees fully achieve all required knowledge and skills for proficient performance in their skilled job.
3. **Identify Employer Demand for Upskilling/Reskilling Skilled Employees:** Establish a systematic process for identifying current employer demand for upskilling/reskilling of currently employed skilled workers.
4. **Build Scalable WBL Training Delivery Support Systems:** Have readily scalable, user engaged, ‘standard operating procedures’ and supporting software systems – automated as much as feasible – for planning, capturing, monitoring, managing, and reporting Information about Trainees and their learning progress and certifications and for conducting Applicant Competency Assessments (**WBLC Assure-Job-Fit™**) in order to be able to scale up future deliveries of WBL programs to thousands of employees in multiple sectors and all regions across Canada.
5. **Build an AI-driven Workplace Technical Language Fluency Training Program:** Build and test an Artificial-intelligence-driven learning system for ‘Workplace Technical Language Fluency’ for Advanced Manufacturing – integrated as appropriate with the online Learning components of WBL Programs – for people new to the advanced manufacturing work environment, particularly immigrants.
6. **Build a Competency Coaching Program for Technical Leaders:** Build and test a Competency Coaching program to assist Technical Leaders in coping with the rapid changes in technologies and business processes in their workplaces.

Objective 1:

Engage Other Sectors across Canada in WBL Programs

Determine if this Work-Based Learning methodology was relevant and valuable for other sectors across Canada: could we faithfully follow the seven (7) principles (see below) that are essential for effective Work-Based Learning while adapting to the work situations and the specific needs of four (4) skilled jobs in other sectors, such as renewable energy, and in other geographies, such as Alberta and the Maritimes? And could we find or build the remote assessment technology needed to conduct certification assessments anywhere in Canada?

Proven Principles Essential for Effective Workforce Development for Entry- to Mid-Level Skilled Jobs¹

1. Use objective, evidence-based **competencies-based processes** as the foundation for all selection, hiring, and training decisions and activities
2. Be **strongly industry-driven, with active employer engagement** in defining competency-based job profiles/standards for each skilled job position and in delivering ‘on-the-job’ technical learning activities to achieve the defined technical learning outcomes
3. **Match** job seekers with skilled jobs on the basis of the **job-specific non-technical competencies** required for job success, and provide **competency gap coaching** for those job seekers who are close to being a good match
4. Be **demand-driven** – build and/or deliver training programs to fill actual current job openings and require that employers hire Trainees as full-time, permanent employees at the start of their learning program (‘earn while they learn’) and/or nominate current employees as Trainees, to meet the company’s skills shortages
5. Use a **blended learning method for technical training** for job-specific technical knowledge and skills, which includes:
 - effective **on-boarding** of Trainees and Company Trainers to the learning program
 - effective use of **advanced learning technologies** (e-Learning, VR/AI learning, micro-learning)
 - use e-Learning to carry the principal load for training but support as required with **instructor-lead coaching on hands-on skills** e.g., use of hand and power tools;
 - closely **align** e-Learning ‘knowledge’ content with ‘practical skills’ learning on the shop floor

¹ Skilled jobs that are unlikely to be eliminated due to the introduction of new technologies, for which employers are willing to train, and which are accessible to job seekers lacking in-demand skills.

- provide Trainees with **structured experiential (on-the-job) learning** guided by company job experts, who are well supported and guided in their training practices and have access to easy-to-use online tracking of Trainees’ progress
6. **Compensate employers** for their key role in providing the Trainee with ‘on-the-job’ learning – subject to the Trainee’s successful achievement of all required job-specific technical learning outcomes
 7. Use **independent, valid, and reliable certification methods** (competencies-based) to confirm Trainees’ successful mastery of all required technical learning outcomes

These are the proven principles by which all WBLC’s Work-Based Learning programs operate, consistently achieving success rates above 90%.

Activities



We built Work-Based Learning programs combining comprehensive eLearning and testing, eInstruction, Shop Floor Assignments, Coaching, and Remote Assessments to adapt to the work situations and the specific needs of 4 skilled jobs in other sectors, while ensuring full compliance with the 7 essential principles stated above.

The Technical Learning Outcomes defined by employers’ ‘job experts’ for each of these skilled jobs are shown below. These are the competencies (skills and knowledge) that trainees acquire through their WBL Program.

Packer – Consumer Goods Sector

TLO Category	Technical Learning Outcomes
Technical Terminology	Capable of understanding and explaining important terminology used in high volume, automated packing workplaces
Safety	Knowledgeable about relevant safety practices for high volume, fast paced work, guarding, and repetitive lifting up to 30 lbs.
Machines and Technology	Knowledgeable about the types of machines used in packing Knowledgeable about using automated human machine interfaces used in packing
Products / Packaging / Quality	Knowledgeable about the products and packaging used in packing Understands the importance of meeting quality standards Understands how to inspect product to ensure it complies with our quality standards
Work Documents & Workspace	Knowledgeable about relevant work direction documents and is able to read and interpret them correctly Knowledgeable about the importance of maintaining a clean and organized workspace, including tools. Able to demonstrate proficient use of hand tools
Packing	Able to pack product into containers or onto pallets as per work instructions Able to place labels on products and pallets in accordance with the work order Able to accurately count number of units packed

Graphic Installation Technician – Sign Industry

Goal	Knowledgeable about all aspects of the Graphic Installer - Level 1 job, including preparation, installation, post installations, and removal of graphic signage.
TLO Category	Technical Learning Outcomes
Graphic Signage	Knowledgeable about the most common types of signs used in graphic installation
Work Documents	Able to read and interpret work directions, graphic layouts, and installation plans without supervision.
Mathematics	Knowledgeable about math functions required for graphic installation
Programs and Machines	Knowledgeable about the types of machines and programs used in graphic installation
Programs and Machines	Knowledgeable about the types of machines and programs used in graphic installation
Materials and Installation Surfaces	Knowledgeable about the characteristics of the common types of vinyl and other materials used in graphic installation
Materials and Installation Surfaces	Knowledgeable about the characteristics of the common types of adhesives and other materials used in graphic installation
Materials and Installation Surfaces	Knowledgeable about the characteristics of installation surfaces and able to choose the proper material with adhesive for installation on that surface
Measurement and Installation Tools	Able to demonstrate proficient use of measuring and installation tools and specialized products used in graphic installation including– selection, handling, usage, and reading.

Preparation, Installation, and Post Installation Operations	Capable of understanding and explaining important terminology used in graphic installation
Preparation, Installation, and Post Installation Operations	Can proficiently perform all preparation operations in graphic installation/removal
Preparation, Installation, and Post Installation Operations	Can proficiently perform installation operations in graphic installation/removal in a workshop or at a customer site
Preparation, Installation, and Post Installation Operations	Can proficiently perform post- installation operations in graphic installation/removal in a workshop or at a customer site
Preparation, Installation, and Post Installation Operations	Knowledgeable about safety in graphic installation/removal

Industrial Manufacturing Operator – Industrial Manufacturing Sector

Goal	<p>Knowledgeable about all aspects of the Complex Manufacturing Operator jobs, including understanding work documents, setup, operating machines, loading, and unloading materials, and performing quality inspections</p> <p>Understands and can explain important terminology used in the workplace</p> <p>Capable of operating a complex machine and producing finished product for high volume/repetitive work</p>
TLO Category	Technical Learning Outcomes
Machines and Parts	Knowledgeable about the types of metalworking machines used at Standens which shape and form steel into parts
Machines and Parts	Knowledgeable about key features on parts that will be inspected
Mathematics	Knowledgeable about basic / shop mathematics
Work Documents	Able to read and interpret key work documents, follow the directions on these documents, and complete logs and tags
Measuring Tools	Able to demonstrate proficient use of measuring tools including handling, usage, calibration, and reading.
Hand Tools	Able to demonstrate proficient use of hand tools, including handling and usage.
Materials	Able to demonstrate general knowledge of the machining characteristics of commonly machined materials.
Complex Machines	Can explain and is able to demonstrate proficient operation of machine producing finished product for high volume/repetitive work

Wind Turbine Blade Repair Technician – Renewable Energy Sector

Goal	Knowledgeable about the Wind Turbine Blade Technician - Level 1 job, including internal and external inspections, work preparation, and repair of blades.
TLO Category	Technical Learning Outcomes
Wind Turbines	Knowledgeable about wind turbines and the technology of wind blade construction and repair
Materials & Tools	Knowledgeable about the characteristics of the common types of materials used in wind blade repair and maintenance
Materials & Tools	Able to demonstrate proficient use of tools and specialized products used in wind repair and maintenance.
Mathematics	Knowledgeable about math functions required for wind blade repair and maintenance
Applications & Equipment	Knowledgeable about the types of applications and equipment used in wind blade repair and maintenance Knowledgeable about the types of programs and equipment used in wind blade repair and maintenance
Work Documents	Able to read and interpret work instructions without supervision
Inspection, Preparation, Repair, Maintenance and Post Operations	Capable of understanding and explaining important terminology used in wind blade repair and maintenance
Inspection, Preparation, Repair, Maintenance and Post Operations	Can proficiently perform all inspection operations in wind blade repair and maintenance
Inspection, Preparation, Repair, Maintenance and Post Operations	Can proficiently perform repair and maintenance in wind blade repair and maintenance
Inspection, Preparation, Repair, Maintenance and Post Operations	Can proficiently perform post operations in wind blade repair and maintenance

Remote Assessment for Certification

As part of the strategic requirements to enable Pan Canadian delivery of WBL programs, we set out to build a solution to remotely conduct final trainee assessments at client locations across Canada. This would eliminate the need for WBLC Assessors to travel to client sites. This will be discussed further in Objective 4.

Outcomes

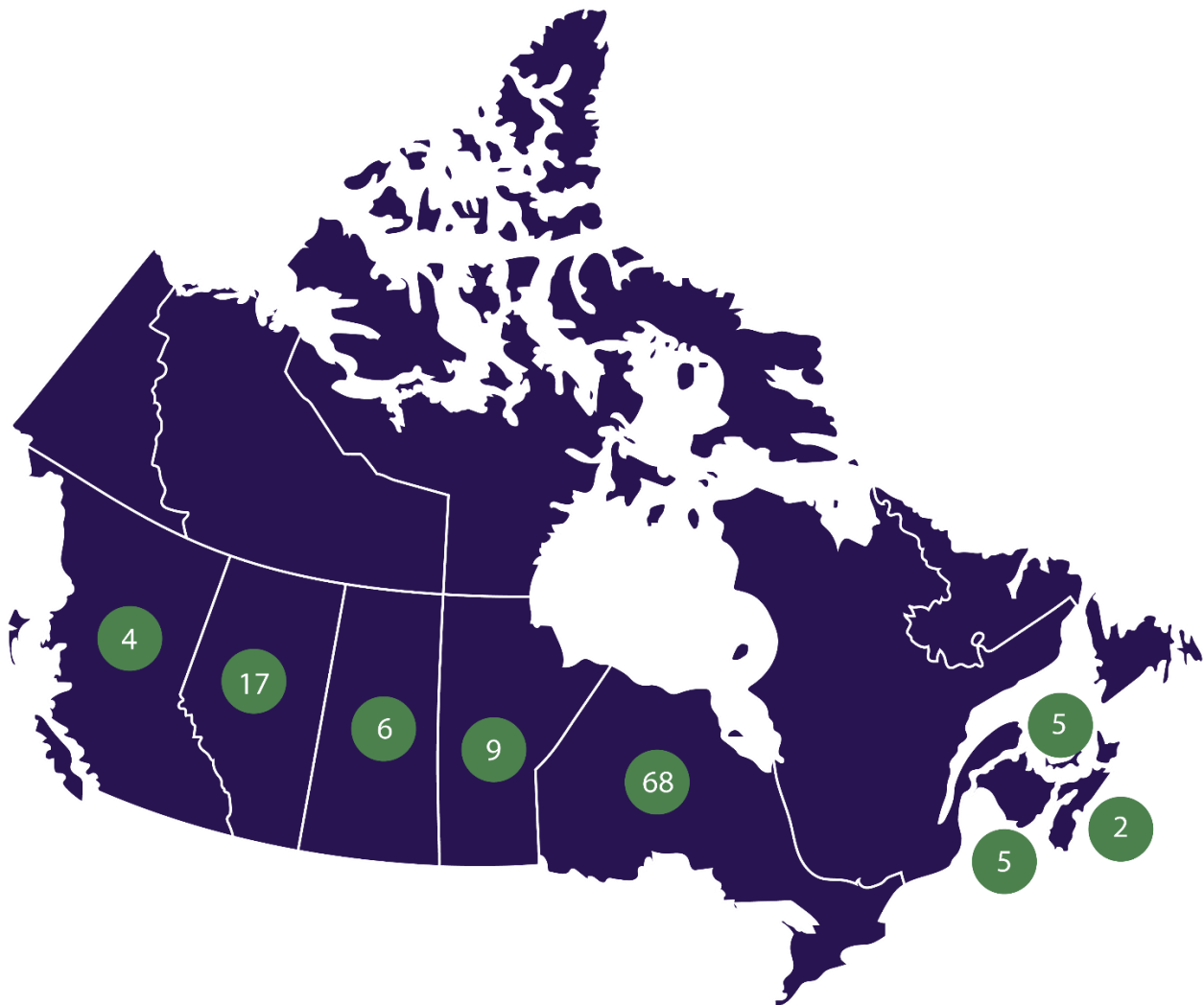
See [Appendix A - SRDC Final Report for full details](#)

Highlights

At least one of the four new WBL programs was successfully delivered in each of the following provinces:

British Columbia	Ontario
Alberta	New Brunswick
Saskatchewan	Prince Edward Island
Manitoba	Nova Scotia

Trainee distribution across Canada for **both our new programs and rapid upskilling programs** is shown in the graphic map below:



Objective 2:

Achieve Rapid Upskilling via WBL Programs

Reduce the training time for three (3) existing WBL programs, such as CNC Machinist [Level 1], by 40% - 50% while ensuring that all trainees fully achieve all required knowledge and skills for proficient performance in their skilled job.

Activities

We re-designed and modified the delivery of WBLC's proven WBL method of integrated and systematic upskilling/reskilling, which had normally been delivered in about 26 weeks (already a significant reduction from the companies' normal practice of 18 to 24 months) for the following three (3) skilled jobs:

- CNC Machinist [Level 1]
- CNC Line Setup – with significantly enhanced e-Learning modules and Shop Floor Assignments
- CNC Machine Operator – with significantly enhanced e-Learning modules and Shop Floor Assignments

This reduction was achieved largely by providing a formal schedule for their entire 'blended learning' program (online 'knowledge' learning plus 'hands-on' on-the-job training on practical skills) that Trainees were expected to follow, with the support of their Company Technical Trainer. WBLC Monitor/Coaches and e-Learning Instructors were thus enabled to track Trainee's progress closely against the required schedule and intervene promptly with the trainee and/or the employer's personnel, especially the Technical Trainers, to ensure that the schedule was followed as closely as possible.

In addition, the close integration of Shop Floor Assignments with the e-Learning modules ensured that the knowledge learning and practical skills learning were aligned and strengthened.

Outcomes

This enhanced 'rapid on-the-job upskilling' reduced training time for the CNC Machinist [Level 1] Program and the CNC Line Setup Program from approx. 26 weeks to 16 weeks (approx. 40% reduction), bringing the participating trainees through a series of industry-determined technical competencies to a proficient level of competence in the job while maintaining the quality of work being performed during the training process. Three upskilling programs, for CNC Machinist [Level 1], CNC Machine Operator, and CNC Line Setup, were designed and implemented in this project.

[Appendix A - SRDC Final Report provides further details](#)

Objective 3:

Identify Employer Demand for Upskilling/Reskilling Skilled Employees

Establish a systematic process for identifying current employer demand for upskilling/reskilling of currently employed skilled workers.

Upskilling

The term “Upskilling” is relatively new and thereby can imply a new kind of learning or training of workers. But conceptually it covers the same general kind of expansion of workers’ capabilities that occurs in formal learning, learning by trial and error, seeing-and-doing, neurological development and other formats of skill expansion or improvement. In other words, it is part and parcel of how people develop skills and competencies at work and therefore a natural process. It is not too remote a consideration to see upskilling not so much as primarily an intervention by employers, but a natural right of workers.

In the present context, we focus on “upskilling” as a specific set of techniques distinct from other, traditional approaches to remedying skill shortages in workplaces, such as more hiring, longer hours, increased pay, etc. And the point of designing an Upskilling Data Collection Framework is to forge a disciplined, managed, and objective approach to designing and implementing measures to remedy the measured shortages.

Finally, we note that participation in adult learning is one of the measures in the scorecard established by the Coalition for a Better Future, an organization that has designed a scorecard of key measures to track progress towards a better future for all Canadians. Tracking demand for upskilling is relevant not only for companies and their sectors but also as an important data point in assessing Canada’s efforts to build a more diverse, sustainable, and prosperous Canada.

How Do We Know About Employer’s Needs For Upskilling?

An objective, practical, participatory, actionable approach to skill shortage remediation requires that employers are the first step in the process towards having the requisite reliable and valid information about skill shortages. To participate in any information gathering exercise, employers should be able to see utility, i.e., a concrete return on their investment in terms of getting information as to what to do to remedy their perceived skill shortages. We believe that in completing the (to be designed) data collection form, companies will/might be forced to think about the causal factors underlying these shortages more deliberately than previously. This proactive approach might then encourage and empower employers to follow through and implement plans to address the upskilling requirements, especially in exploring alternative actions to ones currently employed for upskilling/reskilling of currently employed skilled workers.

Activities

We defined and followed the steps below:

1. We engaged Dr. Morley Gunderson, FRSC, to undertake the following research and synthesis. Dr. Gunderson is a Canadian labour economist and professor emeritus at the Centre for Industrial Relations and Human Resources at the University of Toronto in Toronto, Ontario. He is the inaugural holder of the CIBC Chair in Youth Employment at University of Toronto.
 - a. Create a framework of internal options, not including new hires, that companies can use to address changing workforce requirements – how employers decide on skill needs and weigh options. For each option, especially upskilling, analyze the pros and cons of the value of the data, in aggregated summaries, to policy makers, sector councils/associations, and employers if data on the number employees either in the option now or likely to be in an option in the next six months assuming a robust data collection process could be developed
 - b. Research Canadian, American, and European jurisdictions and/or economic councils to determine whether any jurisdictions/councils have developed data collection processes that target demand for upskilling – describe the systems; identify any research on issues/problems with data collection systems relating to upskilling.
 - c. Recommend the characteristics of an effective data collection system for upskilling assuming it is to be implemented on a pan-Canadian basis in all or some element of advanced manufacturing.
2. Develop and administer a pilot data collection process with a few employers, based on the findings of the above research and synthesis.
3. Report on the data collection method and results.

Outcomes

The research and synthesis provided by Dr. Gunderson are summarized as follows:

The first assignment outlined the changing workforce requirements that companies are facing in the “New World of Work”. Emphasis was placed on both the demand side, reflecting the changing needs of employers, as well as the supply side of the labour market, reflecting the changing composition of the workforce and their preferences and constraints since they can affect the upskilling strategies of employers. Examples of the latter include the training and upskilling requirements for different groups including older workers, Indigenous persons, persons with a disability, new immigrants, and youth. These changes on the demand and supply side of the labour market were then related to the emerging chronic skill shortages faced by employers. The analysis then moved to outlining the internal options, not including new hires, that companies can use to address changing workforce requirements and especially meet their skill shortages, now and into the future. The advantages of upskilling over these other internal options were outlined in detail. Data requirements for the different options, especially upskilling, were outlined so as to assist policymakers, sector councils/associations and employers in

making current and future decisions. For upskilling and reskilling requirements, emphasis was placed on whether existing data exists or could be developed.

The second assignment outlined the existing methods for forecasting skill needs, including the data collection processes and reporting mechanisms that target demand for upskilling and reskilling by employers. It provided information on the plethora of labour market information systems that shed light on demand for skills on the part of employers as well as the skill shortages they experience when the demand for such skills exceeds their supply. The information ranged from national systems to local systems with various systems in between.

The second assignment concluded that the challenge with such an abundance of information is to be able to navigate the system to extract relevant information, or develop their own information systems, that are relevant to stakeholders such as employers wanting to determine their own demand for skills. That challenge is addressed in this third assignment.

The third assignment contains a more thorough analysis of the methods and data necessary to assist policymakers, sector councils/ associations and especially employers in making decisions on filling current and future skills shortages. For upskilling and reskilling requirements, emphasis is placed on whether existing data exists or could be developed through a robust data collection process. The intent is to recommend the characteristics of an effective data collection system for upskilling assuming it is to be implemented on a pan-Canadian basis in all or some element of advanced manufacturing.

The information in the third assignment is presented as a series of practical steps that organizations can follow to determine their own specific skill needs. The steps are generally sequential but may overlap and this will be noted.

The recommendations from Dr. Gunderson served as the initial base for building a data collection instrument to be completed by employers. WBLC made important accommodations to the recommendations to develop the most useful survey based on WBLC's extensive experience working in the upskilling/reskilling field and having direct experience with all types and sizes of employers.

The first accommodation was to expand the definition of upskilling to equate to the practical uses that most employers apply to the definition of upskilling - training on specific job tasks and technical terminology of their employees' existing jobs. WBLC has found that employers often place a higher priority on this focus than preparing their workforce for different jobs with a higher skill level that may be required in the future. These employers are more interested in obtaining immediate, practical results in terms of higher production, reduced waste, and higher quality by improving the capability of current staff to perform their current job. They define this training as upskilling.

The second accommodation was driven by the need to differentiate between the two-time dimensions of upskilling – the current dimension and a future oriented dimension. This is an important point since much of the discussion about upskilling is focused only on the future dimension – jobs will change in the future and unless some action is taken to up-skill employers' workforces, their employees will be unprepared to assume the new jobs in the future. Clearly, this future dimension is important, but it is not the only temporal dimension that is addressed by upskilling. In our view, more attention needs to be placed on the present dimension in order to recognize that the value and benefits of up-skilling applies

to most current employees when considering to what degree their skill sets are adequate to do their present jobs effectively, efficiently, and safely.

Just as importantly, the drivers of upskilling are not necessarily the same for upskilling in the present versus upskilling in the future. Participants, in completing the survey form, noted the differences and indicated they might not have thought about some of their upskilling demands if the form had not been designed around the current and future dimensions as a key component of the data collection.

With these accommodations, WLBC designed a data collection form that can be completed by a knowledgeable company official in approximately thirty minutes.

The data collection process was designed to include two steps. The first step was to provide the participating company with a background on the development of the form and potential benefits of their participation. Participants were also given a link to our data collection site. After completion, WBLC contacted the participants to debrief with them about their experience.

Due to timing issues between business requirements and WBLC's completion schedule of the overall project, only three completed forms were received. During the participant interviews, companies reported that they gained valuable insights about their skills needs and options for meeting those needs. Two participants recommended that the process be implemented on at least an annual basis and preferably every six months.

WBLC sees tremendous value to policy makers, employer associations, and policy makers in recognizing that, with all the effort and resources being spent on upskilling, there are no agreed data collection processes to collect data about jobs, about required competencies, about the reasons that employers consider upskilling to be important, and that indicate these requirements by whether they currently exist now and/or they expect these and other upskilling requirements will occur in the future.

We ask the reader to think about a future where, equipped with the above information, industry and employer associations can potentially reach out to government to talk about how they could collaborate to address their upskilling/reskilling issues and government policy makers will have a clearer understanding of the whole picture because data would now exist to support effective decision-making.

This is the notable outcome of this objective – the demonstration that this future is attainable.

[Appendix B provides further details in the following reports and data collection processes:](#)

- Appendix B-1 - Employer Upskilling Demand - Report 1
- Appendix B-2 - Employer Upskilling Demand - Report 2
- Appendix B-3 - Employer Upskilling Demand - Report 3
- Appendix B-4 - Employer Upskilling Demand - Data Collection

Objective 4:

Build Scalable WBL Training Delivery Support Systems

Have readily scalable, user engaged, 'standard operating procedures' and supporting software systems – automated as much as feasible – for planning, capturing, monitoring, managing, and reporting Information about Trainees and their learning progress and certifications and for conducting Applicant Competency Assessments (WBLC Assure-Job-Fit™) in order to be able to scale up future deliveries of WBL programs to thousands of employees in multiple sectors and all regions across Canada.

Activities: Business Processes

We developed end-to-end **responsive, systematic business processes supported by software systems** to enhance and scale WBLC's program diversity and capacity.

The following processes were documented in detail:

- Determine & Report Employer Demand
- Build New WBL Programs
- Recruit Companies
- Recruiting Applicants & Conducting Assessments
- Upskill Recruiting & Assessing Nominees
- Placing Candidates with Companies
- Onboarding Participating Companies, Trainers & Trainees
- WBL Program Delivery

Outcomes: Business Processes

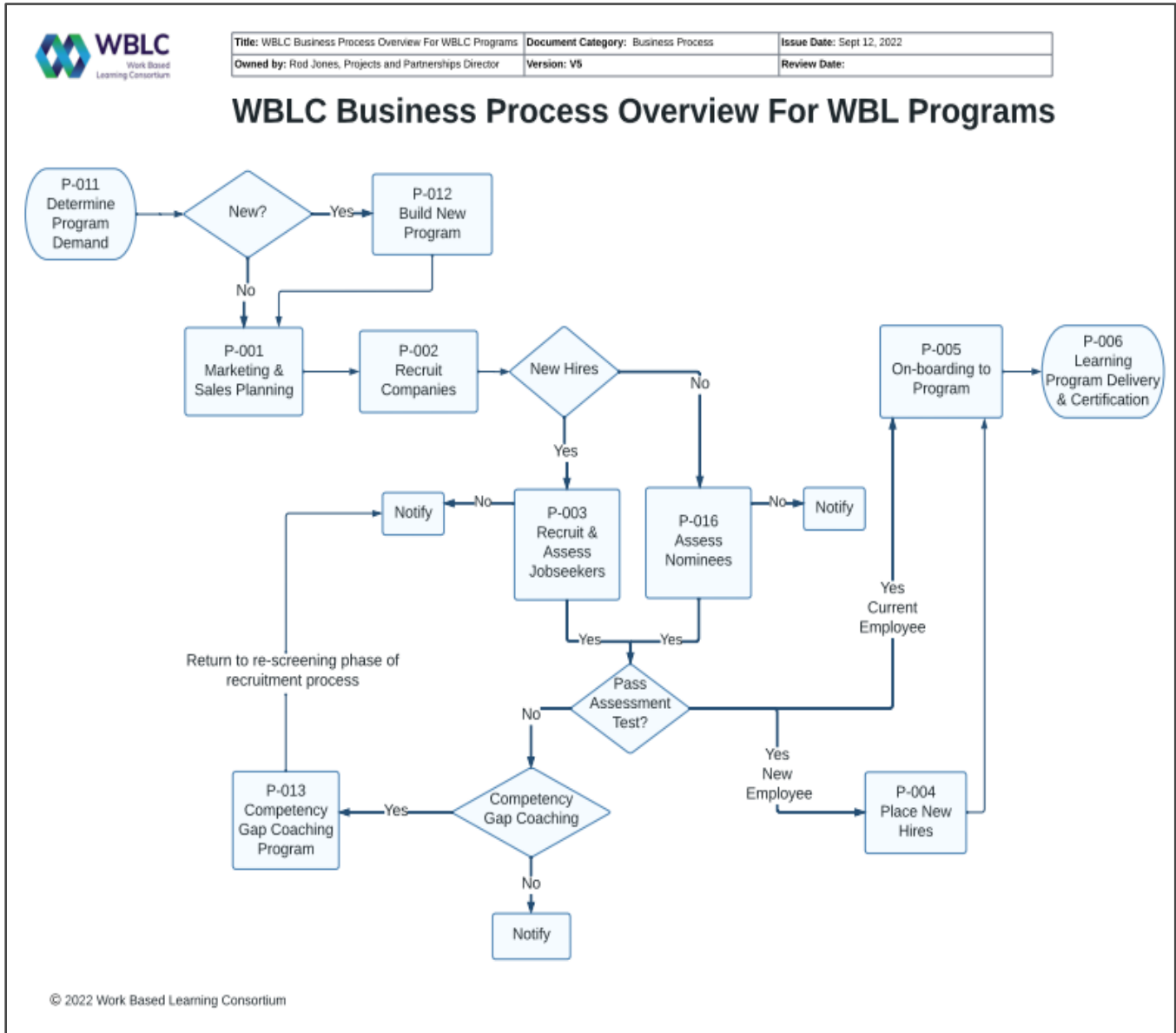
Documenting and automating WBLC processes allowed us to:

- Create a common language framework for every phase of program development – enabling rapid upskilling
- Ensure that the processes were standardized across programs:
 - facilitating business knowledge transfer
 - enabling scalability to expand WBL programs offerings to new regions and sectors
 - systematically identify employer demand
- Ensure that the processes were accessible by all team members – enabling effective onboarding for new team members and partners
- Ensure that processes were monitored and updated – enabling quality outcomes

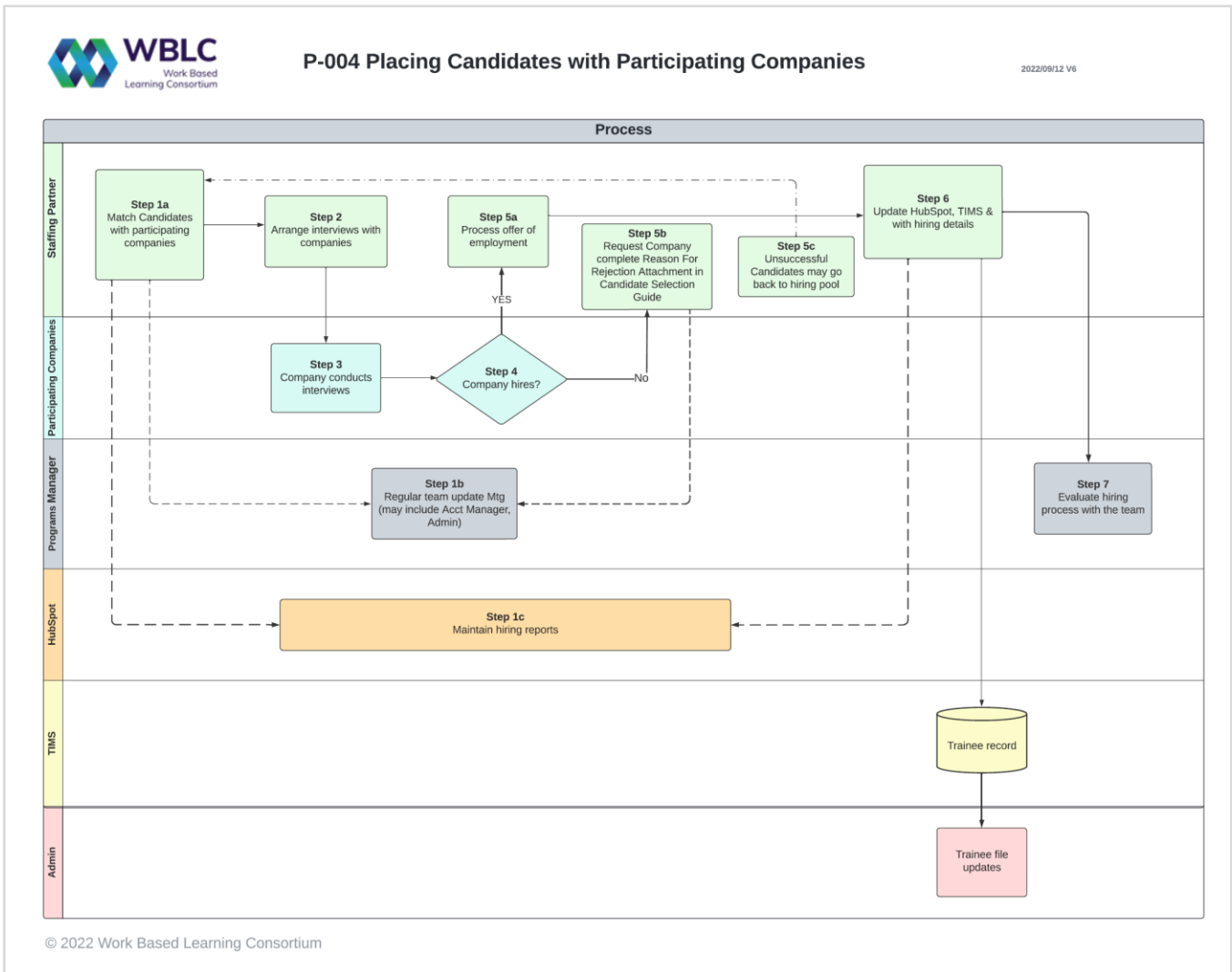
Key WBLC business processes were mapped out and most were developed in detail. Partners and team members provided input in their development and improvements.

Overall, this work allowed WBLC to meet project outcomes, increase our ability to scale nationally, and ensure we are prepared for future business and projects.

The following chart provides our high-level process map for WBL Programs.



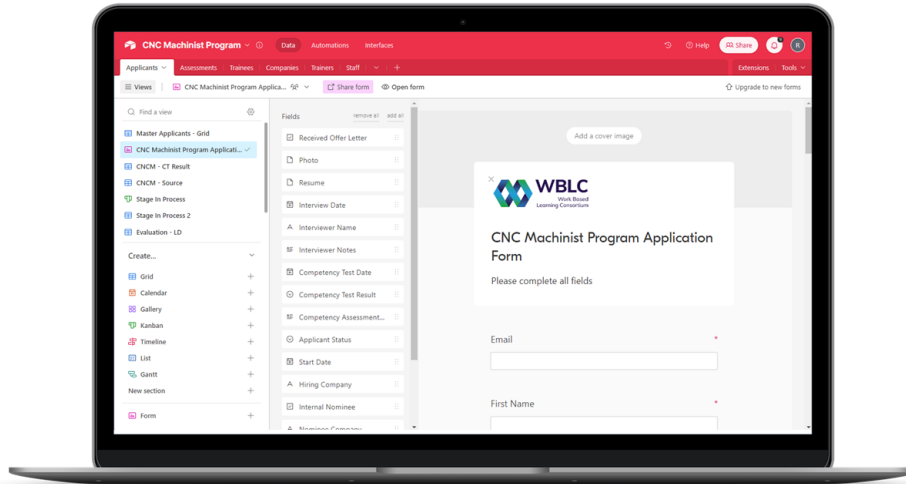
The following two charts show the detailed process map and operating procedure activities for one business process: P-004 Placing Candidates with Participating Companies.



WBLC Business Processes			
Data Automations Interfaces			
Table of Contents P-002 Recruiting Companies P-003 Recruiting Applicants & Conducting Assessments P-004 Placing Candidates P-005- Onboarding P-006 Program Delivery			
Views Grid view Hide fields Filter Group Sort Color Share and sync			
Task List for P-004 Pla...	Subtasks	Owner	Required Document
1 P-004 Placing Candidates V6 2022-08-25 Owned By: Wayne Lamon, Project and Programs Director		Program Director	
2 Staffing Partner matches Candidates with participating companies	<input type="checkbox"/> SP uses data from <i>Recruiting Companies P-002 & Recruiting Applicants P-003</i> to match Candidates with participating companies <input type="checkbox"/> SP provides company with Candidate Assessment Reports & any other required hiring documentation (resume, job ...	Staffing Partner	Candidate Assessment Report Template https://docs.google.com/document/d/1NvC130fPb3LR8I9qN7cCQL7E4QQLE8m/edit?usp=sharing&ouid=110014524816042069341&rtpof=true&sd=true
3 Company interviews and hires Candidate	<input type="checkbox"/> Company interviews Candidate and hires as a Trainee <input type="checkbox"/> SP facilitates hiring process and hiring documentation with the company <input type="checkbox"/> SP informs Candidate of hiring details <input type="checkbox"/> SP Informs Program Director & Account ...	Company Staffing Partner	Staffing Hiring Spreadsheet Template https://docs.google.com/spreadsheets/d/17ZY0RKF-4CApNM5aFM9WJYI3TT-1osxm/edit?usp=sharing&ouid=110014524816042069341&rtpof=true&sd=true
4 Company interviews and does not hire Candidate	<input type="checkbox"/> Company interviews Candidate and does not hire <input type="checkbox"/> SP requests company complete Attachment Reasons for Rejection of Candidate Selection Guide (Reason for Company rejection) <input type="checkbox"/> SP informs Program Director & Acct Manage...	Company Staffing Partner	Candidate Selection Guide Sample https://docs.google.com/document/d/1bK3xTKcw-yk7Pz7b05FokOomYxlAzjpB/edit?usp=sharing&ouid=110014524816042069341&rtpof=true&sd=true
5 Hiring Updates	<input type="checkbox"/> Using the completed Hiring Report Spreadsheet, Admin updates TIM with Hiring Information <input type="checkbox"/> Acct Manager updates HubSpot <input type="checkbox"/> Admin provides Virtro with Trainee list if Language Training is offered	Admin Acct Manager	Staffing Hiring Spreadsheet Applicant Recruiting Report
6 Confirming Trainers	<input type="checkbox"/> M/C invite Technical Trainers to Role Review/ Information Session <input type="checkbox"/> M/C conducts brief interview according to predetermined script <input type="checkbox"/> M/C decides if Trainer will be suitable and meet Technical Trainer requirements...	M/C	
7 Program Director conducts weekly hiring status meetings	<input type="checkbox"/> Acct Manager or PD conducts weekly hiring status meetings with SP, PD, Admin and other team members/company contacts as required <input type="checkbox"/> Program Director & Acct Manager conducts hiring process evaluation at the end of the intake	Acct Manager Program Director	
+			

Activities: New IT Systems

In conjunction with our business processes , we updated our dated *asp.net* applications for Trainee Management utilizing modern-day applications. Our current stack utilizes a blend of cloud-based Software as a Service (SAAS) and low code applications that are easily managed and can be configured for any program.



Customer Relationship Management	HubSpot
Application Portals	WordPress / Airtable
Competency Assessments	Hipaalyzer
Trainee Information Management	Airtable / Stacker
Learning Management System	TalentLMS
Remote Assessments	TeamViewer

Outcomes: New IT Systems

For WBLC Programs, our IT systems are now configured easily:

- Set up **New Programs**
- Track and manage a person’s information at the **Applicant** stage, including: customized application portals, applicant data, and competency assessment results.
- Track and manage a person’s information at the **Candidate** stage, including: Interviews, Competency Gap Coaching, company information, hired/rejected data.
- Track and manage a person’s information at the **Trainee** stage, including: hiring, onboarding, eLearning, personal observations, technical learning outcomes, and certification.
- Provide all Evaluation Reporting

We enhanced our phased, logically-sequenced Workplan activities – with durations based on prior experience to demonstrate the feasibility of meeting project objectives for seven blended learning programs.

Activities: Remote Assessment System

As part of the strategic requirements to enable Pan Canadian program delivery, we set out to build a solution to remotely conduct final trainee assessments at client locations across Canada. This would eliminate the need for WBLC Assessors to travel to client sites.

- The solution utilizes a Microsoft Surface GO tablet, a 4K Pan-tilt-zoom camera, secondary battery to extend the run-time, and a tablet frame in which all components are mounted within & on, which is in turn attached to a standard (included) camera tripod.
- The solution allows WBLC's Remote Assessors to view with sufficient clarity the physical work areas within a roughly 12-foot radius of the Trainee.
- The solution can run up to four hours on battery and has its own internet connectivity allowing multiple Trainees to be assessed.

Outcomes

- The solution requires almost no training at company sites for set up and take down
- The solution is hands free, allowing the Trainee to focus on their tasks. The video and audio quality allows the Assessor to clearly see, hear, and speak with the Trainee (even in noisy factory environments), making it ideal to assess competencies.
- The solution is easily shipped in large suitcase-like hardened case.
- The components can be replaced / upgraded without having to rearchitect entire solution.



Objective 5:

Build an AI-driven Workplace Technical Language Fluency Training Program

Build and test an Artificial-intelligence-driven learning system for ‘Workplace Technical Language Fluency’ for Advanced Manufacturing – integrated as appropriate with the online Learning components of WBL Programs – for people new to the advanced manufacturing work environment, particularly immigrants.

Activities

A pilot program that offered Practice Simulation technical terms training was developed and introduced into various WBLC advanced manufacturing e-learning programs (specifically two CNC Machining cohorts and one Line Setup cohort) from July 2022 through April 2023.

The Practice Simulation training used Smart AI Virtual Humans trainers (see image above) to introduce technical terms specific to each role to explore how beneficial such supplemental training would be to English-as-an-Additional-Language (EAL) trainees.

In total, over 50 simulations were created for each program that incorporated technical terms specific to each role in conversation with the Smart AI Virtual Humans. The Technical Language training was embedded in WBLC’s Learning Management platform that housed concurrent technical training specific to CNC Machining and Line Setup respectively.



Outcomes

During on-line AI supported technical language learning, candidates expanded their knowledge of work-place terms, but it is not clear that this increased knowledge is directly and fully attributable to the specific AI enabled learning process or to other learning opportunities occurring at the same time, specifically English language learning.

Despite the technical issues associated with the use of the AI language learning platform (which at this date have largely been fixed), all trainees improved their pronunciation of technical terms to a significant degree and increased their pronunciation rate through practicing on-line. This significant increase in the quality and speed of pronunciation is a direct effect of the technical language training because it cannot be due to a general increase in their English fluency. These technical terms are not of any meaningful frequency in daily language so they could not have been practiced other than during technical language training. This illustrates a key impact of AI supported technical language learning on candidates whose knowledge of technical terms was already considerable (as the Argot test outcomes reported above show).

In sum, the evidence shows that AI supported learning of technical language results in significant improvements in pronunciation and pronunciation speed.

[Appendix C provides a detailed description and evaluation of this innovation](#)

Objective 6:

Build a Competency Coaching Program for Technical Leaders

Build and test a Competency Coaching program to assist Technical Leaders in coping with the rapid changes in technologies and business processes in their workplaces.

Activities

WBLC developed and pilot tested a competency coaching program aimed to provide non-technical coaching to technical managers to embed synergistic individual and organizational growth in their everyday work.

As we've shifted from industrial economies to knowledge-based economies that derive from the information age, the secure, calculated 'scientific management' approach is no longer viable enough to serve as the fundamental framework that primarily directs management thinking. A manager's role has grown from managing complicated (relatively predictable, linear, cause-and-effect) environments via 'rules and tools' to managing complex problems comprised from often unpredictable interactions that are not linear, but emergent, often riddled with interacting, interdependent, and diverse connections.

These four-week coaching programs were designed to enhance the quality of working life through boosting personal effectiveness in three ways: performance, personal interactions, and realizing potential. These programs merge personal growth with professional development so technical managers can meet more complex responsibilities, craft a sound understanding of how they manage themselves and relate to others, and cultivate a strong mindset especially pertinent to the dynamic nature of 21st Century work.

These programs are empirically driven, saturated with the most current evidence-based research in the areas of cognitive and behavioural science, where theory is translated into informative -- yet practical -- applications that can be used across all aspects within our multidimensional nature of work.

Outcomes

Overall, it is evident that the 'bare bones' of these pilot programs have been proven to be relevant and beneficial to firmly establish the cognitive and mindset skills necessary for technical management to confidently face the unique challenges of 21st century work in the knowledge economy.

Future iterations of these programs should include:

- More robust and comprehensive pre-live session preparation resources designed to streamline participant preparation (essential)
- 'Optional' resources provided for participants who are motivated to explore fundamental program concepts more in-depth
- Consideration of one-on-one coaching for a specified term post-program or, in the very least, a three-month and six-month follow up group coaching session to ensure robust integration of the concepts introduced in each program

[Appendix D provides further details in the following report and needs analysis:](#)

- Appendix D-1 – Competency Coaching Evaluation Report
- Appendix D-2 – Competency Coaching Needs Analysis



Knowledge Transfer

Reports, Whitepapers, & Case Studies

Applicant Competency Assessments (WBLC *Assure-Job-Fit™*) Report

WBLC *Assure-Job-Fit™* has proven to be a valid assessment process for non-technical competencies required in a number of key entry and mid-level industrial skilled jobs. We can show statistically valid evidence that we have achieved the successful design of a theoretically sound and operationally effective assessment model that critically complements an efficient, targeted, and sound technical training model – Work-Based Learning Programs. Both are likely to serve the staffing needs of industrial employers well – better than other existing approaches to recruitment, selection, and training of industrial skilled workers.

We commissioned WBLC Assessments Director, Dr. Michael Godkewitsch, and one of the principal architects of this methodology – to prepare a detailed description of ***Assure-Job-Fit™*** and provide the evidence for its effectiveness, to inform and engage others who may be seeking effective methods for ensuring that jobseekers will be a ‘good fit’ with a specific skilled job, thereby increasing the likelihood of success – both short- and long-term – for both jobseekers and employers.

[Appendix E - 1 provides details on the WBLC *Assure-Job-Fit™* Applicant Competency Assessment Method](#)

Upskilling/Reskilling Challenges and Solutions

WBLC commissioned the Canada West Foundation (CWF), under the guidance of Janet Lane, Director of the Human Capital Centre, to prepare and publish **whitepapers on topics of importance and relevance to our learnings regarding employer engagement in upskilling/reskilling**. These included:

- What Now? Rapid Employee Upskilling & Reskilling – An innovative approach to skills shortages.
[This paper is found in Appendix E - 2](#)
- Skills, Innovation and Productivity
[This paper is found in Appendix E - 3](#)
- Matching People with Jobs & Jobs with People
[This paper is found in Appendix E - 4](#)

Case Studies

WBLC also commissioned CWF to prepare case studies on two of our programs:

- Graphic Installation Technician initiative (new WBL Program)
in progress
- CNC Line Setup initiative (Rapid WBL Program).
in progress



WBLC Core
Project Team

WBLC Core Project Team

WBLC Project & Partnerships Director Rod Jones, B.Eng., MBA	Direction and oversight of all project activities, jointly with the WBLC Project and Programs Director; outreach & recruiting companies; recruiting project team members; contracts management; admin oversight; promotion & communications; preparing Project Charter; overall project expenditure authorization and budget management; progress reports & final reports;
WBLC Project & Programs Director, Registrar Wayne Lamon, MBA	Direction and oversight of all project activities, jointly with the WBLC Project and Partnerships Director; direction & oversight of all learning programs; development of job profiles; oversight of virtual classroom development, building employability gaps modules & process, virtual coaching system, and shop floor trainer modules; coordination of project activities; oversight of IT systems registrations; coordination of all assessment and training delivery activities; oversight of Monitor/Coach activities; review and confirmation of Certification requirements
WBLC Director of eLearning and Digital Technology Systems Reema Duggal, B.Comm	Design and development of virtual classroom programs and systems (e-learning + VR-enabled) for WBL Programs; directing and overseeing the work of the assigned Technical Content Specialists and Subject Matter Experts. Design and management of Trainee Information Management Systems and WBLC Learning Management systems for all new programs, including architecture, configuration, testing, maintenance, security, and backups.
WBLC Director of Assessments Dr. Michael Godkewitsch, Ph.D.	Developing Assessment Processes; reviewing Assessment results and providing reports/recommendations for all Candidates; directing competencies testing processes for validity; designing the competency gaps analysis framework and participating in the allocation of candidates to learning modules in the Bridging Employability Competencies Gaps innovation
WBLC Operations & Administrator Manager Ann Boyko, B.AS	Providing coordination and administrative support for the development and implementation of operational and administrative procedures, lead the development and documentation of new WLBC business processes, performs administration functions; administration of contracts, invoices, schedules; overseeing integration of procedures with WLBC systems
WBLC E-Learning Development Paul Coleman	Providing videography, computer aided design, and elearning development
WBLC E-Learning Instructors Paul Coleman Brendan Daly	Providing coaching and support for Trainees in their e-Learning Programs
WBLC Monitor/Coaches Pavel Wegrzyn Rob Picinic Cody Bechard Martin Dominguez	Monitoring and coaching of WBL Trainees and Company Technical Trainers during on-the-job training; Certification evaluation and testing of Trainees
WBLC Company Recruiting Specialist Rick Stomphorst	Recruit companies as participants in WBL Programs; lead the development of the Remote Assessment for Certification technology system
WBLC Competency Coaching Manager Lynette Dundee, MA	Lead the development and pilot testing of the Competency Coaching Program for Technical Leaders



Conclusions & Next Steps

Conclusions

1. WBL Programs can be valuable for companies in many different sectors and **can be delivered anywhere in Canada** to get them the skilled workers they need to grow and prosper, by allowing ready access by employees to workplace-based skills training.
2. WBL Programs can enable employees to acquire the skills and knowledge required for their skilled job in **only 20% of the time** required for informal 'on-the-job' training – weeks rather than months – so they can quickly adapt to technological or business practice changes taking place around them.
3. WBL Programs can enable all stakeholders to make effective strategic training investments that will **unlock Canada's productivity potential**, promote innovation, and secure the nation's position as a global economic leader.
4. Diverse jobseekers who are hired and trained or upskilled for these well-paid skilled jobs – they earn while they learn – can acquire industry-defined technical skills and knowledge leading to rewarding career pathways that would not otherwise have been available to them.
5. WBL Programs are effective in responding to stakeholder requirements for reducing inequities within the labour market.
6. WBL Programs enable more open access to training regardless of income, geography, and background.
7. WBL Programs enhance the ability of immigrants to succeed in Canadian workplaces.

Next Steps to Engage More Employers in Upskilling / Reskilling Skilled Employees

Challenges

Most industrial employers – especially many SMEs – don't see it as their job to train – at least not beyond the barest of essentials. Based on our extensive interactions with many employers, we see this as some combination of the following views:

- Government is responsible for getting people trained
- No clear, measurable economic benefits from training
- Can't do training on their own – it's not their expertise
- Very few sources of rapid training suitable for employees in the job-specific technical knowledge and skills they need to work safely, with high quality, and good proficiency.

Conducive Conditions

But many employers can and will do their part, given the right conditions.

To get employers of skilled workers to take on the job they can and will do very well – teaching their employees the practical skills needed for their specific skilled job – they need to have **structure, motivation, and support – and continuity**:

- Add more in-demand skilled jobs to the list of available WBL Programs, focusing first on the selection criteria, the technical job competency specifications, and the certification standards, working with clusters of employers with common interests, across Canada.
- Provide economic incentives – some ‘carrot’, some ‘stick’ – for those employers who train employees to an industry-approved skilled job specification – but only if the employee gets certified (independently).
- Engage and support employers in providing highly effective ‘on-the-job’ learning of the practical skills required to perform the job proficiently, per the industry-approved skilled job specification.
- Support companies in providing effective ‘job instruction’ for trainee employees who are learning the required job-specific practical skills.
- Build progressively Canada-wide, with sustained effort, over 5 years, across sectors and regions.

This Is Transformative Work

It’s not another variation on what we’ve always done to support jobseekers or employee upskilling. It’s fundamentally different and uncommon. And it’s not a silver bullet. It is focused on skilled workers – those who work with complex machinery, equipment, materials, and methods, doing installations, setups, changeovers, operating, troubleshooting, maintenance, repair, etc. in a variety of sectors.

It requires no more money, but it does require a re-allocation. It might actually cost less. And the results will be much better – for everyone.

