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# **Addressing essential skills gaps among participants in an OHS training program**

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- The Research Opportunities Program of the Ontario Ministry of Labour



## Project Team

### Institute for Work & Health:

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- Siobhan Cardoso, Project Coordinator
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- Ron Saunders, (University of Toronto)<sup>1</sup>
- Michael Swift, Statistical Analyst

### Blueprint Consulting:

- Karen Myers<sup>2</sup>
- Mark McKerrow



<sup>1</sup> Principal Investigator

<sup>2</sup> Co-Investigators



## Project Partners

### Labourers' International Union (LiUNA) Local 506 Training Centre:

- Ted Gedney, Training Director
- Omar Passos, Assistant Director

### Infrastructure Health and Safety Association (IHSA):

- Shannon Hunt, Laura Shier

### Essential skills / learning consultants:

- Tracy Collins, essential skills curriculum consultant
- Roger Duclos, learning consultant
- Skillplan
- Essential Skills Group





## What are essential skills?

- Framework developed through research supported by Employment and Social Development Canada and other national and international agencies.
- Essential skills “are the foundation for learning all other skills and help people evolve with their jobs and adapt to workplace change” (from ESDC website).



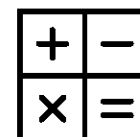
## Reading Text

Reading refers to the skills needed to understand and apply information found in sentences and paragraphs.



## Document Use

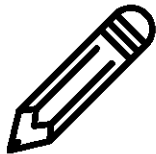
Document use refers to the skills needed to find, enter and use letters, numbers, symbols and images in electronic and paper formats.



## Numeracy

Numeracy refers to the skills needed to make sense of and apply mathematical concepts and information.

**Essential skills focused on in pilot intervention**



## Writing

Writing refers to the skills needed to compose handwritten or typed text to communicate information and ideas.



## Oral Communication

Oral communication refers to the skills needed to exchange thoughts and information with other people.



## Working With Others

Working with others refers to the skills needed to interact with other people (one or more).



## **Continuous Learning**

Continuous learning refers to the skills needed to continually develop and improve one's skills and knowledge in order to work effectively and adapt to changes.



## **Thinking Skills**

Thinking refers to the skills needed to solve problems, make decisions, think critically, plan, remember details, and find information.



## **Digital Technology**

Digital technology refers to the skills needed to understand and use digital systems, tools and applications, and to process digital information.





## Motivation for the project

- 2012 survey under the OECD program for International Assessment of Adult Competencies shows **almost half of working age population in Canada below Level 3** (of 5) in literacy; **over half below Level 3** in numeracy.
- Workers reluctant to sign up for literacy training (concerns about screening, stigma). Integrating ES curriculum into existing programs may help. (Canadian Council on Learning, 2008)
- Little research on whether adding ES curriculum to OHS training would make it more effective.



## Research Question

Can we improve the effectiveness of an OHS training program by redesigning the curriculum of an existing OHS program to address essential skills (ES) gaps?





## Selection of target program

**Hoisting and rigging program** of LiUNA local 506 training centre, based on curriculum developed by IHSA.

### Why?

- Substantial injury risk.
- Most trainees have essential skills needs in: reading, document use, numeracy (e.g., calculation of safe loads)





## Nature of the intervention

- Developed modified version of the training program to address gaps in interpretation of documents and numeracy skills.
- Some trainees took the regular program; others the modified program.
- To keep training duration the same, those taking the regular program had additional review exercises.
- Trainees completed tests of essential skills levels before the training and a written test of safety knowledge after training.

## Project stages 1/2

Intakes and data collection

**Baseline Intakes**  
(5 intakes, 20 trainees)

**Modified Intakes**  
(4 intakes, 20 trainees)



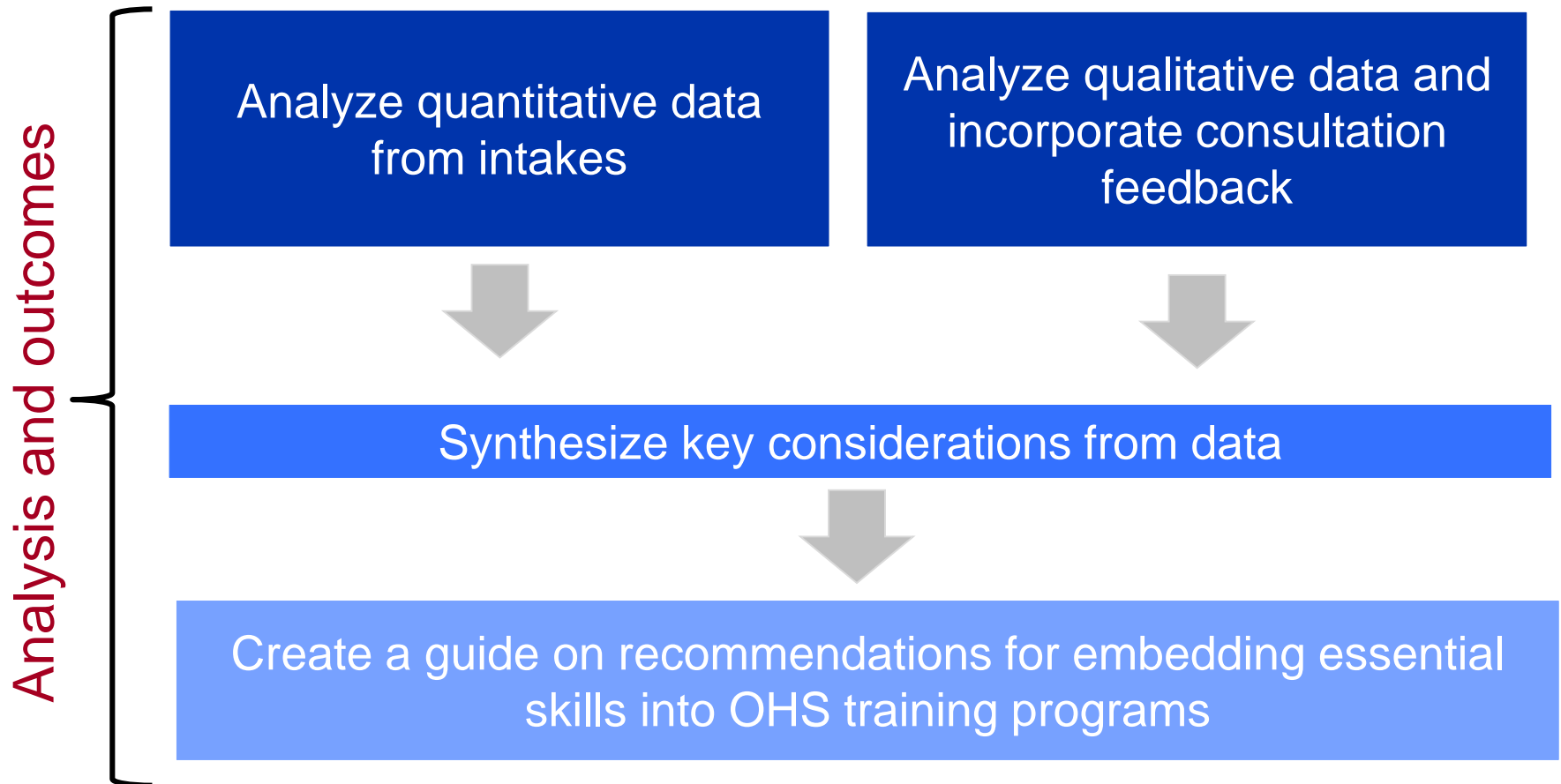
### Quantitative data collection:

- Hoisting and rigging written test
- Essential skills assessment
- Entrance/exit survey

### Qualitative data collection:

- Focus groups with modified group (n=20)
- Interviews with baseline (n=5)
- Partner consultations( n= 5)
- HSA consultations (n=4)

## Project stages 2/2





## Quantitative data collection

We collected data on i) trainee essential skill level and ii) hoisting and rigging knowledge in the following ways:

### 1 Demo survey

- Age
- languages spoken
- educational attainment
- construction and hoisting & rigging experience

### 2 ES assessment

- Document use
- Numeracy

### 3 H&R written test

- Foundational job tasks
- hand signals

### 4 Exit survey

- Attitudes and learning preferences
- Feedback on training program

# Findings

## Quantitative and qualitative analysis







## Trainee characteristics



**70%** of trainees  
were born in  
Canada



**1/3** had not  
completed high  
school; another  
**40%** did not have  
a post-secondary  
credential



Based on completed  
essential skills test,  
**85%** had document  
use skills **below  
level 3**



## Quantitative Analysis Highlights

- Dependent variable: score on written test at end of training.
- Key explanatory variable: whether trainee was in group that had regular or modified curriculum.
- Control variables:
  - In all equations: score on document use test
  - Alternately: age, first language, educational attainment, years of experience (in construction; in hoisting and rigging)
- Results: Modified program had significantly positive effect on test scores.



## Qualitative data collection

- Data were collected through:
  - Five interviews with graduates of the baseline program
  - Four focus groups with graduates (n=20) of the modified program.
- We also interviewed our project partners (training centre, instructor, curriculum developers, and learning specialists) to better understand their perspective on training and contextual factors.



## Qualitative analysis methods

- Transcripts were coded using an inductive and axial coding process
- The process of creating themes was iterative in nature as we further analyzed for connections between themes.
- Consultations with sector-based health and safety associations in Ontario were held to validate preliminary findings and receive feedback on emerging themes



## Qualitative Analysis Highlights

The analysis extracted the following key themes:

### 1 Industry

- Tension between production and safety culture
- High risk work vs. low labour market power

### 2 Workplace

- Busy worksites, time pressures, and the “good worker”
- Use of shortcuts

### 3 Worker

- Diversity, language, and communication
- Low Essential Skills and learning difficulties

### 4 Training

- Importance of hands-on learning
- Disconnect between training and worksite practice



## Industry factors

### ***Theme: Perceived tension between production and safety culture***

- Overarching focus on production in the construction industry
- A focus on production can affect work practices by creating pressure to get work done quickly

**R: “There’s guys who’ve been on the job for two weeks and [safety] is all they care about, because that’s the number one thing in their head is safety, safety, safety. Which is good, but at the same time they don’t really get much work done.” [FG4]**



## Industry factors

### ***Theme: High risk work vs. low labour market power***

- While rigging tasks are often routine, the consequences of improperly rigged loads can be fatal
- Our population of trainees usually take on work that doesn't require a journeyperson certificate, resulting in lower job security
- This can influence their likelihood to refuse unsafe work

**R: “If he’s saying, I’m not going up on that roof, it’s slippery, it’s icy, my life is at risk, the next guy shouldn’t turn around and say, well, screw you, I’m going to do it.” [FG1]**



## Qualitative Analysis Highlights

The analysis extracted the following key themes using a detailed thematic analysis:

### 1 Industry

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## Workplace factors

***Theme: Busy worksites, time pressures, and the “good worker”***

- Participants described the construction worksite as a fast-paced environment, with multiple trades often working simultaneously
- Participants reported pressure to “look busy”, for fear of being reprimanded
- Concept of the “good worker” as one who gets the work done

**R: “They [engineers] are the brain. We are the brawn.”  
[FG2]**



## Workplace factors

### *Theme: Use of shortcuts*

- Time pressures can interfere with workers' ability to apply what they learn in training
- This may lead to shortcuts or alternatives to formal calculations being used to gauge load safety, including estimations
- Shortcuts are usually not problematic in the case of familiar loads, but can hold severe consequences in other circumstances

**R: “If it would have taken me that long on an actual job site to move a load from here to there, I would've been fired, I would have lost my job.” [P5]**



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## Worker factors

### ***Theme: Diversity, language, and communication***

- Racial and ethnic diversity on worksites
- Communication a key aspect of construction work; language barriers may create safety issues

**R: “Because I couldn’t necessarily understand what [my supervisor] was saying, I just kind of assumed and there were situations where I was put in unsafe situations because of the lack of understanding we had with each other.” [P3]**



## Worker factors

### ***Theme: Low Essential Skills and learning difficulties***

- Our quantitative data outlined participants' low essential skills levels, which were confirmed during qualitative data collection
- Numeracy gaps in particular appeared to be a barrier for participants' learning

**R: “You had these basic hands signals and then this advanced calculus math; that was a little tricky.” [P5]**

**R: “The math questions in [the training], there could have been a few more examples to help us through and broken down a little easier to understand.” [FG1]**



## Qualitative Analysis Highlights

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## Training factors

### ***Theme: Disconnect between training and worksite practice***

- The realities of workload and workflow can be in conflict with what workers are trained to do, particularly in the context of using calculations
- The pressure to “look busy” and to reflect an image of the “good worker” also plays a role in this disconnect

**R: “Well, you don’t really have the opportunity to sit there and crunch numbers if things are going on.”  
[FG2]**



## Training factors

### ***Theme: Importance of hands-on learning***

- The more hands-on, equipment-based portions of training were easier for trainees to understand and apply on the worksite
- Participants reported finding hand signals and knots useful on the worksite

**R: “What applies to us, the actual practical things, slings and cables and all that, that’s more beneficial”  
[FG2]**





## Considerations for training based on our analysis

- Provide rationale for arithmetic content
- More applied exercises using equipment found on worksites.
- Streamline training content to focus on what can be applied on the job.
- Incorporate a worksite-based mentorship component



## **This kind of intervention is promising because...**

- Based on our invention assessment learning outcomes were improved from embedding essential skills into training
- LiUNA Training Centre continues to use the modified program in their training delivery
- LiUNA Training Centre has expressed interest in applying the same process to other training programs

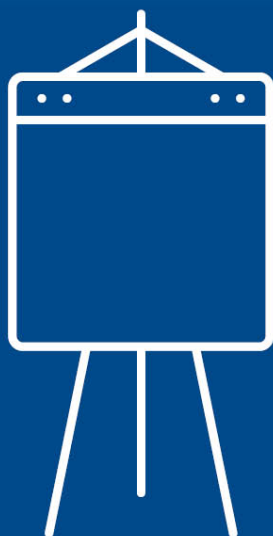
## Next steps

- A guide on how to embed essential skills into other training programs was created based on our experience
  - Created in consultation with our research team and based on feedback from HSAs
  - Applicable to different sectors
  - Available for free





# Essential Skills and OHS Training



A guide to embedding an essential skills  
curriculum within an OHS training program



## Essential Skills and OHS Training

A guide to embedding an essential skills curriculum  
within an OHS training program

- 4 Preface
- 6 About this Guide
- 7 The Essential Skills
- 8 The process at a glance
- 9 Step 1 Identify a program for which embedding ES curriculum may be appropriate
- 10 Step 2 Establish the project team
- 11 Step 3 Outline the evaluation strategy
- 12 Step 4 Identify the most important essential skills gaps to address
- 13 Step 5 Develop the ES curriculum to be embedded within the existing OHS training program
- 14 Step 6 Validate the modified curriculum with the instructional staff and other stakeholders as required
- 14 Step 7 Finalize the curriculum documents
- 15 Step 8 Offer a train-the-trainer session to help guide instructors on the delivery of the modified curriculum
- 16 Step 9 Develop the evaluation strategy
- 17 Step 10 Test and fine-tune the modified program
- 17 Step 11 Implement the final program
- 17 Step 12 Evaluate the program evaluation per the evaluation strategy



## About this Guide

### What is the purpose of this guide?

This step-by-step guide is designed to assist OHS training organizations who may wish to modify the curriculum of an existing occupational health and safety (OHS) training program in order to address gaps in essential skills among their trainee population.

### Who should use this guide?

OHS training organizations that deliver training programs to groups with relatively low levels of essential skills.

### What are “essential skills”?

Through extensive research, the Government of Canada and other international agencies have identified and validated nine dimensions of “Essential Skills”. These skills “are the foundation for learning all other skills and help people evolve with their jobs and adapt to workplace change.”

*(Employment and Social Development Canada (ESDC) website, <https://www.canada.ca/en/employment-social-development/programs/essential-skills.html>)*

### What are “essential skills gaps”?

ESDC has developed “complexity” ratings on a five point scale of tasks performed by workers in different occupations. At least some tasks for most occupations require level 3 or better to perform well.

Results from the 2012 Survey of Adult Skills under the Programme for the International Assessment of Adult Competencies show that almost half of the working age population in Canada scored below level 3 in literacy, and over half scored below level 3 in numeracy (Statistics Canada, 2013), which indicates that for many workers, there are gaps between their essential skills levels and the requirements of the job. Gaps in ES such as oral communications, interpreting documents or basic numeracy could also impede the effectiveness of OHS training.

## The process at a glance

1

Identify a program for which embedding ES curriculum may be appropriate

2

Establish the project team

3

Outline the evaluation strategy

4

Identify the most important essential skills gaps to address

5

Develop the ES curriculum to be embedded within the existing OHS training program

6

Validate the modified curriculum with the instructional staff and other stakeholders as required

7

Finalize the curriculum documents.

8

Offer a train-the-trainer session to help guide instructors on the delivery of the modified curriculum

9

Develop the evaluation strategy

10

Test and fine-tune the modified program

11

Implement the final program

12

Evaluate the program evaluation per the evaluation strategy

# Feedback and questions



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