



Targeted call for FSC Project Partners

Instructions to complete the application form

Please refer to the Future Skills Centre's (FSC) **Targeted Call for FSC Project Partners Guidelines** document when preparing your application.

This application form is structured to help you address the selection criteria for this call and give reviewers easy access to your project information. This form is divided into the following sections:

- Part 1 - General information
- Part 2 - Project summary
- Part 3 - Project details
- Part 4 - Project work plan and budget
- Part 5 - Declaration

If you would like to request accommodations or other types of support, please contact Maysa Mourad by email at targetedcall@fsc-ccf.ca or by phone at 437-331-0613.

If you have any questions while compiling your application, you may contact our team at targetedcall@fsc-ccf.ca. We would be happy to answer any questions.

PART 1 - GENERAL INFORMATION

1. Lead organization

Name of lead organization

NORCAT

Name of project lead

Don Duval (CEO) and Jason Bubba (COO)

Project lead's preferred method of contact (email address and/or phone number)

dduval@norcat.org and jbubba@norcat.org

705.521.8324 (w)

2. Proposed project

Project title

Accelerating and Expanding the Adoption of Tech-enabled Blended Learning Programs

Project start and end dates

January 15th, 2022 to September 30th, 2023 (~20 month project duration)

Projects must end no later than September 30, 2023.

Amount requested from FSC (total)

\$1,869,715

Project partners and their location

We have maintained our relationships with two key partners for our new project: Vale and Glencore – two of the largest mining operators in Canada – both have multiple operating mines based in Sudbury, Ontario. These Northern Ontario partners will continue to provide industry expertise / market insight into our content development and blended-learning delivery model to ensure we are aligned to meeting the needs of

our target populations in the mining industry.

Complementing our existing mining partnerships, in this new project we are expanding our partnerships with the inclusion of the Ontario General Contractors Association (OGCA) – a long-standing association supporting the industrial, commercial and institutional sectors throughout Ontario. NORCAT and the OGCA will work together to build, implement, and support our proposed training and development initiative that is outlined in this proposal.

PART 2 - PROJECT SUMMARY

1. Proposed project “one-liner”

How would you describe your new project in one sentence?

“Accelerating and expanding the adoption of tech-enabled blended learning programs to transform the future of training and development in the skilled labour industries across Canada”.

(30 words maximum)

2. Proposed project summary

How would you describe your new project and how it builds on the testing and learning of your current project to date?

We suggest that this summary covers the main information about how your new project addresses all selection criteria of this targeted call.

Our proposed project continues to focus on addressing the skilled labour shortage and the need to engage and provide training for our next generation of skilled labour workers both in Canada's all-important mining and construction industries. Building on our success to date, we will continue to focus on providing meaningful opportunities and career pathways for youth, women, rural, and Indigenous people across Canada.

Our new project proposal builds on the testing and learning of our current project in three key ways:

- First, we have worked closely with the Future Skills Centre resources and external consultants to help us develop a meaningful research methodology and processes to gather relevant information during the administration of our current blended-learning programs to date. We have received feedback to improve this process that we will apply to our expanded deployment to serve our target populations and will incorporate in our new learning technology development, testing, and deployment.
- Second, part of our new project is focused on leveraging our in-house capabilities to expedite the development and testing of two new augmented reality (AR) learning programs. Based on feedback from our trainees, we are keen to evaluate, compare, and assess the level of engagement and learning outcome achievement between our proposed two new AR programs and our existing VR blended-learning program.
- Last, we have generated evidence, learned, and now seek to quantify and learn more about the true value of integrating multiple learning technologies (VR, simulation, and now AR) into broader blended learning experiential training programs. New workforce entrants are seeking this type of learning and development experience while employers are concurrently seeking cost-effective and innovative methods to training their workforce to be both productive and safe on the job.

(250 words maximum)

3. Additional scope

How does your new project go beyond the scope of your current FSC-funded project?

The additional scope may include expanding or extending a project model, its principles and/or components. For example, it may include expanding the project to new regions or jurisdictions, including new or larger target populations, and testing different delivery formats to understand what works to address demands. This would assume the potential for bringing additional partners to deliver the project at a broader scale. The additional scope must be grounded in new concrete learning questions to contribute to your work and of others in the skills ecosystem.

- First, we are expanding our existing blended-learning program to engage nearly 200 additional trainees from our target populations. This will more than double our participants giving us more statistically valid insight to test our hypothesis.

- Next, we are proposing to build an in-demand, new, and scalable one-week confined space blended learning training program that will integrate classroom education, AR learning technology, and a customized confined-space container simulator. As part of this program trainees will don AR glasses and be immersed in a simulated confined-space environment and learn how to complete tasks efficiently and address hazards (e.g. fire, helping injured workers, and smoke, among other variables) often encountered in confined spaces in the mining and construction industries.
- Last, based on trainee feedback, we are proposing to further develop and test an AR-enabled learning program to build the skills and confidence on the proper use of a fire extinguisher. This module will be included in both our existing blended learning program and will form part of our proposed new one-week confined-space program mentioned above.

(150 words maximum)

4. Importance of the additional scope

Why is the additional scope of your project important to your organization, sector and target populations? Why is it timely?

- First, NORCAT aspires to be the global leader in skilled labour training and development. Our proposed project directly contributes to expediting our journey towards achieving this milestone.
- Second, both the mining and construction industries are critical contributors to Canada's future economic prosperity. Canadian labour market studies project the need for more than 130,000 new mine workers and 300,000 new construction workers with the right skills, competencies, and confidence by 2029.
- Last, and most important, this project provides opportunities/career pathways for our target populations (youth, women, rural, and Indigenous people). For nearly all Canadian skilled labour companies, providing employment opportunities for these groups is embedded in their overall strategy.

Engaging these target populations not only addresses a market need, but also provides a pathway to a meaningful career and sustainable economic security. We believe our blended learning programs not only present a meaningful

learning opportunity, but also, will create brand ambassadors citing the unique and engaging technology-enabled experience of learning through NORCAT's programs.

(150 words maximum)

PART 3 - PROJECT DETAILS

In this section, please provide information about how your new project supports each of the selection criteria of this targeted call.

We provide prompting questions to help you address all criteria in the application guidelines. You may prepare this section following the prompting questions in sequence or using your own sections and narrative.

Although you have flexibility regarding the format for this section, please make sure that you address all criteria according to the prompting questions. Reviewers will assess your application by scoring each criterion individually.

This section should not exceed **seven** pages. We anticipate that most proposals will present this section in **five** pages.

Relevance

Our proposed project continues to focus on addressing the skilled labour shortage and the need to engage and provide meaningful, engaging, and scalable training for our next generation of skilled labour workers in Canada's mining and construction industries. Since our initial proposal, we have engaged and collaborated with additional mining companies across Canada to validate this labour shortage. In fact, in the Sudbury region alone, there is an estimated need for over 1,000 new mine workers over the next 24 to 30 months – most of which will be recruited from our target populations. Furthermore, we have opted to expand the development and delivery of our blended-learning programs by leveraging a new partner (Ontario General Contractors Association) to build an in-demand, transferable training program to support the Canadian construction industry – a sector that is forecasted to need over 300,000 new workers by 2029 – of which 100,000 will be in Ontario alone.

Building on our success to date, our new project will continue to focus our efforts to provide opportunities and career pathways for youth, women, rural, and Indigenous

people using an expanded, tested, and improved state-of-the-art scalable blended-learning training program.

Furthermore, and beyond the market need relevance, we have also validated from our past graduates of our blended learning program, that prospective skilled labour workers entering the job market for the first time seek to participate in training programs that leverage emerging learning technologies vs. the traditional narrated “power-point” style training programs. We feel this trend is more broadly representative of the skilled labour industries and not specific just to mining or construction. Therefore, we are very excited at the prospect of our learnings being used to inform blended-learning models for other industries in Canada.

Lastly, this project directly aligns with FSC’s strategic priorities by enabling the testing, prototyping, and evaluation of new training approaches for equipping workers with necessary skills to be both productive and safe on the job – all day, every day. Beyond expanding the reach and engagement of students / trainees from our target populations, we are focused on developing, testing, and deploying two new blended learning programs that will test and evaluate the inclusion and utilization of augmented reality (AR) to expedite learning pathways while having meaningful learning outcomes as compared to the status quo. Furthermore, our market assessment has validated the primary value of incorporating AR learning technologies into broader blended learning programs will build both confidence and competence in skilled labour workers in functional activities that have significant risks associated with them. Hence, we have opted to build and incorporate AR into both our proposed confined space program and build and incorporate an AR-based fire extinguisher training module that will be integrated into our existing blending learning program and our pending confined space training program.

For our study, we have identified the market need to train prospective and existing skilled labour workers on the proper use of a fire extinguisher and how to effectively and safely work in confined spaces. For both - current in-market technology-enabled training solutions are limited in their realism, engagement, and quality. Therefore, we are not only assessing and comparing the method of training delivery, but also and more importantly, we are building a learning module that is in-demand, relevant, and ultimately will drive safety in the skilled labour industries.

Learning, Innovation, and Evidence, and Coherence

Over the last 18 months of building, testing, and deploying our blended learning solution we have gathered meaningful insight and feedback from both our students

and trainers / educators. We have validated the integration of eLearning + VR + simulation training coupled with in-the-field hands-on competency evaluation as a unique and new way of training – not only for the mining industry, but in our research, we have yet to find any skilled labour industry in Canada doing this. Over this time, we have identified areas for improvement, opportunities to develop, deploy, and integrate a new learning technology, and expand our integration with our existing partners and a new partner to collaborate with and engage in our new project. Our proposed project will evaluate two innovative, unique blended-learning training programs that have yet to be introduced in the skilled labour industries.

Our proposed project will continue to leverage the methodology we co-developed with the Future Skills Centre to deliver the blended learning program and gather data / feedback from our trainees / students. With this information, we will test our hypothesis that our integrated / blended learning training methodology will enable new or existing skilled labour workers to get to a better level of competency and confidence in a shorter timeframe, in a less expensive manner, and via a more engaging and inspiring method vs. the status quo educational methods. Ultimately, our blended learning programs will provide the relevant skills and build confidence for skilled labour workers to fill in-demand, sustainable, and well-paying jobs in an important Canadian industry.

With the insight gathered from our current project coupled with new insights / market trends we have seen, we have identified three main components / project activities that will be addressed in our new proposed project. These new initiatives present us with new learning questions that will contribute to validating our aforementioned hypothesis.

1. **Development and inclusion of a fire extinguisher augmented reality (AR) module.** As part of our new project, the learnings and feedback from our trainees indicate a strong opportunity to incorporate AR as part of our blended learning experience. In fact, the direct feedback we solicited from our trainees in the current phase of the project, through program evaluation, has revealed that VR training was helpful, enjoyable, and successful, but there is still a desire for a more hands-on experience. We anticipate integrating our new AR fire extinguisher module into both our existing blended-learning one-week program for mining and our new proposed one-week confined space training program. We believe implementing AR into the training addresses not only the feedback we have received to date, but also will enable us to test an alternative learning technology as we try to optimize our blended learning training approach.

Furthermore, over the past three years (and outside the scope of our current FSC project), we have been working to develop a rudimentary AR fire extinguisher learning technology and now see a unique opportunity to leverage our work-to-date and focus our efforts to further develop this solution and incorporate it into our blended learning training program as part of our new Future Skills Centre project. Although we have invested and have an exceptional foundation to build upon, we will be required to do a ground-up development of the AR fire extinguisher learning tool to ensure we have a more technologically advanced and user-friendly product to integrate with our refreshed blended learning program.

- 2. Development and deployment of an AR / simulation enabled confined space training program.** As part of our proposed project, we are further seeking to develop a comprehensive and practical confined space training program that will be delivered to our target populations seeking career opportunities in both the construction and mining sectors. Building this “first-of-its-kind” program will first require the development of a complete instructor-led theory / curriculum package which will include instructor guides, presentation materials, student guides, knowledge skill tests, and support material. The second part of the one-week program will involve using a portable, confined space container that trainees will enter wearing AR head gear / glasses. Within the environment, the trainees will encounter and learn to manage and complete on-the-job activities and learn to handle emergency situations. As an example, confined space / tunnel emergencies require workers to adapt to situations involving smoke, fire, rescuing / helping a colleague, among other scenarios near impossible to replicate in a classroom or in-the-field. We believe the realism of AR, coupled with the physical constraints of a confined space, provides a unique opportunity to re-define training in dangerous or risky work situations. If this experience proves to be fruitful, we believe we will demonstrate an entirely new, cost effective, and scalable blended learning training model that will transform how we build competence and confidence in skilled labour workers working in challenging environments using AR and simulation training programs.

Beyond the AR integration and learning opportunity, we have validated that better educating skilled labour workers on working in confined spaces and understanding the proper utilization of a fire extinguisher are both in-demand and life-saving skills.

Given the work in our first project, we proudly have a well-defined blended-learning

process that will facilitate the development and deployment of our new AR fire extinguisher module and our new AR-enabled confined space training program. These initiatives will generate new evidence and insights to validate how trainees respond to AR and will help us to answer the following learning questions:

- Does AR drive meaningful learning outcomes (improved knowledge, practical skills, confidence)?
- Is the experience comparable, and is it better, worse, or similar as compared to status quo methods to train on hands-on dangerous and risky activities – such as putting out a fire or dealing with an emergency in a confined space?

We think this is a really exciting opportunity that builds on our strong research and work to date. We anticipate building the AR / simulation confined space program over twelve (12) months and the AR fire extinguisher training solution over a concurrent, but shorter nine (9) month period. In terms of trainee engagement, we estimate 125 to 150 trainees will be trained using the AR fire extinguisher and approximately 50 to 60 additional trainees will participate in the confined space program.

3. Expanded engagement / enrolment of students in our target populations.

Our current project has generated meaningful feedback and insights that not only informed our proposed new project, but also, we believe is forming the basis of a broader narrative on how we can effectively train prospective and existing workers across multiple skilled labour industries in Canada. That said, to make this claim in a more substantive manner, we believe we need more data / evidence to validate our claims. With that, as part of our new project we will enroll an additional 125 to 150 students that will participate in our expanded blended-learning program. This includes a refreshed blended learning program that will incorporate VR, equipment simulation training, and class-room theory, that will complement our hands-on experiential competency validation in our NORCAT Underground Centre. We anticipate delivering the current blended learning program from January to September 2022 upon which, starting in October, we will integrate and deliver the new AR fire extinguisher module for the remaining 12-month timeframe until September 2023. Over this delivery period, we will implement the appropriate research methodology to compare / contrast the engagement, experience, and achievement of learning outcomes.

To ensure we maintain our focus on research and evidence, and by addressing lessons learned from the existing project, we will be making some incremental

improvements in our study designs for all of our existing and proposed programs to ensure we are gathering the best insight into how each aspect of the blended learning model (e-learning, VR, simulation, AR) influences learning and practical skill performance. We believe this furthers our commitment to evaluate our proposed “new way of doing things” for this project. By making improvements to our study design and research methodology, we can find solutions to the following learning questions:

- To what extent does the new, enhanced, blended-learning training model generate learning outcomes (improved knowledge, practical skills, confidence) compared to traditional training delivery methods?
- How does the use of each technology (AR, VR, Equipment Simulation, eLearning) influence learning outcomes independently? As a whole?

Equity, Diversity, and Inclusion

With our new proposed project, we will remain committed to engaging and supporting our target populations – demonstrating a strong commitment to equity, diversity, and inclusion. Given the geographic location of most Canadian mining operations, our target populations in this project relate to providing opportunities and career pathways for youth, women, rural, and Indigenous people. For nearly all Canadian mining companies, providing employment opportunities for these groups is embedded in their overall strategy creating a strong pipeline of candidates to participate in our blended learning programs.

At NORCAT, it is important to note that we have worked with and provided training for thousands of youth, women, Indigenous people, and isolated / rural people aspiring to have a well-paying and meaningful career in Canada’s mining and construction industry. In fact, as it pertains to our current FSC project, we have had exceptional recruitment of participants from our target populations including 23% of our participants being women, 37% are Indigenous, and 63% are youth (<30 years old).

We are committed to continuing to leverage our long-standing partnerships with Indigenous communities to ensure they are engaged and presented opportunities to participate in our refreshed / expanded programs. We are excited to build on this foundation and enhance our capabilities to engage and provide innovative training programs that will ultimately help Canadian mining and construction companies provide meaningful employment for not only Indigenous people, but also men,

women, and young people living in rural / isolated mining communities across Canada.

Capacity

Much like our existing project, our new project has not been implemented anywhere in the world. Given we are proudly regarded as a leader in skilled labour training, we feel we are well positioned to make this claim. That being said, within NORCAT, we have previously worked with partners to deliver on similar projects that demonstrate our capacity, skills, experience, and resources to deliver on our new project.

- First, we have trained hundreds of new and existing workers, including youth, women, rural, and Indigenous workers. We have worked to develop and deploy the right pedagogical model to engage trainees, the teaching guides and tools, and the assessment and evaluation criteria for trainee productivity and safety in operating various pieces of mining / construction equipment and tools.
- Second, as it relates to the development of AR learning, it is important to note that we have an in-house studio building engaged-learning content delivered using both VR and AR technologies. We have demonstrated our capabilities to understand how to use and integrate VR to creatively engage a trainee and achieve the stated learning outcomes. We will leverage this know-how and approach as we build-out our new proposed AR-based training solutions that will be integrated into the broader blended-learning program.
- Last, our underground operating mine provides hands-on experiential training on various pieces of mining equipment that we will leverage for our hands-on training using our portable confined space training container. Furthermore, we have experienced training resources that understand how to assess and validate skills of trainees both in an operating mine and confined space environment.

Through our regular updates with the Future Skills Centre – be they informal or formal quarterly reports - we believe we hold a great track record of delivering on our objectives, listening and taking guidance, and identifying challenges and opportunities for continuous improvement. We are extremely excited about this new project and believe it will further transform our national thinking in skilled labour training and development strategies.

(3,500 words maximum)

PART 4 - PROJECT WORK PLAN AND BUDGET

1. Please submit a **one-page work plan** with key milestones and their timeline. **Do not** include detailed activities at this time. If your proposal is selected, we will work with you to develop a detailed work plan.

2. Please complete the project budget template provided to you as part of the application material.
 - a. Include only **new funding** associated with your new project and its additional scope. Please do not include the existing funding that is already part of your current funding agreement with FSC.
 - b. If applicable, identify new funding pending or confirmed for this project from other sources. **This funding should be included as in-kind contributions.** (Please note that funding from other federal sources cannot be counted towards in-kind contributions)

3. Please submit your work plan and budget by sending these files, along with this completed form, to targetedcall@fsc-ccf.ca.

4. You may use the space below to provide comments to accompany your work plan and/or budget.

N/A

(100 words maximum)

PART 5 - DECLARATION

By submitting an application, the lead organization and its partners agree to the requirements of the following sections, detailed in the guidelines outlined for this funding call, and they affirm that they comply with and/or commit to the following:

- Organization eligibility.
- Active support for co-creating and carrying out an evaluation with an FSC-approved evaluator, if FSC decides an evaluation is appropriate for this project.
- Active engagement in knowledge mobilization activities related to the project.
- Compliance with the Tri-Council Policy Statement on the Ethical Conduct of Research Involving Humans.
- Confidential due diligence inquiries from Future Skills Centre into the applicant.

Signature

Don Duval

Name of signing authority

Don Duval

Date

November 1st, 2021