



# Evaluation Report

## Certification of Airport Security Project

**An Outcome Evaluation of a Royal Roads University Graduate Student Research Project**

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## List of Acronyms

CA	Contribution Analysis
CASP	Certification of Airport Security Project
CATSA	Canadian Air Transport Security Authority
CSTD	Canadian Society for Training and Development
CTP	Certified Training Professional
CTDP	Certified Training and Development Professional
DRAP	Deficit Reduction Action Plan
EoP	End-of-project
I4PL	Institute for Performance and Learning
KASR	Knowledge, Attitudes, Skills, and Relationships
LPA	Learning and Performance Advisor
MAL	Master of Arts in Leadership
NTCP	National Training and Certification Program
OM	Outcome Mapping
PI	Principal Investigator
QAF	Quality Assessment Framework
RFP	Request for Proposal
RRU	Royal Roads University
SCTR	Service Contractor Trainers
SOPs	Standard Operating Procedures
SRE	Sustainability Research Effectiveness
SSHRC	Social Sciences and Humanities Research Council
TDR	Transdisciplinary Research
ToC	Theory of Change

## Executive Summary

### Introduction

This report presents an outcome evaluation of a research project undertaken by a Royal Roads University (RRU) Master of Arts in Leadership (MAL) student. The Certification of Airport Security Project (CASP) intended to guarantee a standard and level of consistency in the delivery and measurement of airport security training within the Canadian Air Transport Security Authority (CATSA) by providing professional development opportunities through a Learning and Performance Advisor (LPA) certification program. CATSA's work focuses on air transportation system security, including passenger, baggage, and non-passenger screening (CATSA, 2021). With constantly changing terrorist threats and advances in security technology, it is imperative that CATSA evolves as an organization to uphold its mission of protecting the travelling public. LPAs are a vital part of CATSA's operations as they are responsible for training and testing screening officers to prevent threats from entering Canada's airports. While LPAs are responsible for others' certification standards, at the time of the CASP, there were no certification standards for LPAs, presenting challenges for consistent certification processes and course delivery (Martens, 2009). The CASP aimed to support CATSA's mandate for consistency by building the capacities of LPAs to ensure that LPAs were held to the same high standards across CATSA regions, contributing to positive organizational development towards continuous learning and improvement, and advancing the skills and capabilities of the principal investigator (PI). This outcome evaluation assesses whether and how the CASP contributed to these outcomes.

### Methodology

The evaluation investigates whether and how the CASP generated new knowledge, attitudes, skills, and relationships (KASR) among key actors, and how those changes supported performance across CATSA departments to become more integrated and systematic. The objective of the evaluation is to critically assess the CASP by collecting and analyzing information about its activities, outputs, and outcomes to support learning for research effectiveness.

The evaluation applied the Outcome Evaluation approach, which is designed to assess research projects, specifically transdisciplinary research, sustainability research, research-for-development, and other change-oriented approaches (Belcher et al., 2020). The approach assesses whether and how a research project contributed to the realization of outcomes using a theory of change (ToC) as an analytical framework. A ToC can be used to provide a detailed description and model of why a change is expected to occur within a specific problem context, explicating the underlying mechanisms of behaviour change conceptualized as changes in KASR. It models the causal relationships between a project's activities and results, and how these are expected to manifest in outcomes, giving particular attention to the impact pathways, actors, and steps involved in the change process.

The evaluation team led a participatory workshop in June 2019 to define the scope of the evaluation, document the implicit ToC for the CASP (Figure 1), and identify possible sources of evidence to empirically test the ToC. The Outcome Evaluation method collects participant and stakeholder perspectives to identify and assess the project and external contributions within a change process (Belcher et al., 2020). To gather these perspectives, we conducted 17 interviews with 18 informants and reviewed seven documents such as personal communications and organizational documents (e.g., draft certification frameworks). These sources of evidence were used to evaluate actual outcomes against the ToC, and answer the following questions:

#### 1. Research Outcome Evaluation

- a. *To what extent and how were outcomes realized?*
- b. *Were there any positive or negative unexpected outcomes from this project?*
- c. *Could the outcomes have been realized in the absence of the project?*
- d. *Were the assumptions pertaining to why these changes were expected sustained?*
- e. *Are the higher-level changes likely to be realized?*

Project design and implementation were characterized using an adapted version of Belcher et al.'s (2016) Transdisciplinary Research Quality Assessment Framework (QAF). The QAF was used to highlight elements of research design and implementation that contributed to the realization of outcomes. This assessed the degree to which the CASP incorporated recognized quality criteria of transdisciplinary research<sup>1</sup>, organized under the principles of Relevance, Credibility, Legitimacy, and Positioning for Use. The project assessment was guided by the following questions:

## 2. Research Project Assessment

- a. *What elements of the research design and implementation supported outcome realization, and how?*
- b. *To what extent and how did the project engage effectively with relevant stakeholders?*
- c. *To what extent were the research findings sufficiently relevant to achieve the stated objectives?*
- d. *To what extent and how are target audiences aware of and using the project outputs?*
- e. *How does RRU support student success in research?*
- f. *What lessons about effective research practice can be learned from this case study?*

Results were analyzed and grounded in the context of social change theories to address shortcomings acknowledged within literature that the theoretical bases for many ToCs are weak (Weiss, 1997; Stachowiak, 2013). Researchers seldom make explicit the theories underlying why change is expected to manifest from their research. Social change theories applied to the evaluation to help explain changes observed include stakeholder theory, situated learning theory and social capital theory to explain the implications of outcome realization.

## Project Overview

By directly engaging key stakeholders including LPAs, regional managers of learning and development, and the director of operations throughout the research process, the CASP utilized an action research focus to examine the LPA role and suggest recommendations for the future of LPA assessment and certification. The CASP completed project scoping exercises, a literature review to examine adult learning techniques and evaluation methods, and primary data collection using a World Café. Project scoping interviews with key stakeholders situated the CASP within the organizational mandate, gained buy-in from CATSA, and allowed World Café questions to be developed and refined. The CASP utilized a World Café to collect qualitative data on participants' thoughts regarding LPA assessment and certification, as well as create a forum for discussion. The key outputs of the CASP included: identifying key competencies of the LPA role; LPA beliefs on the benefits and challenges of a certification program based on competency assessment; assessment methods LPAs believed were appropriate and could give a true assessment of their roles and responsibilities; and strategies for assessment and certification. The CASP aimed to contribute to key intended outcomes such as: supporting CATSA to recognize recurrent learning requirements, value continuous learning, and uphold principles of continuous learning in practice; improving the confidence and professional capacity of LPAs; supporting CATSA to develop an LPA certification program; and supporting the PI's professional development to continue in performance management at CATSA.

## Project Theory of Change

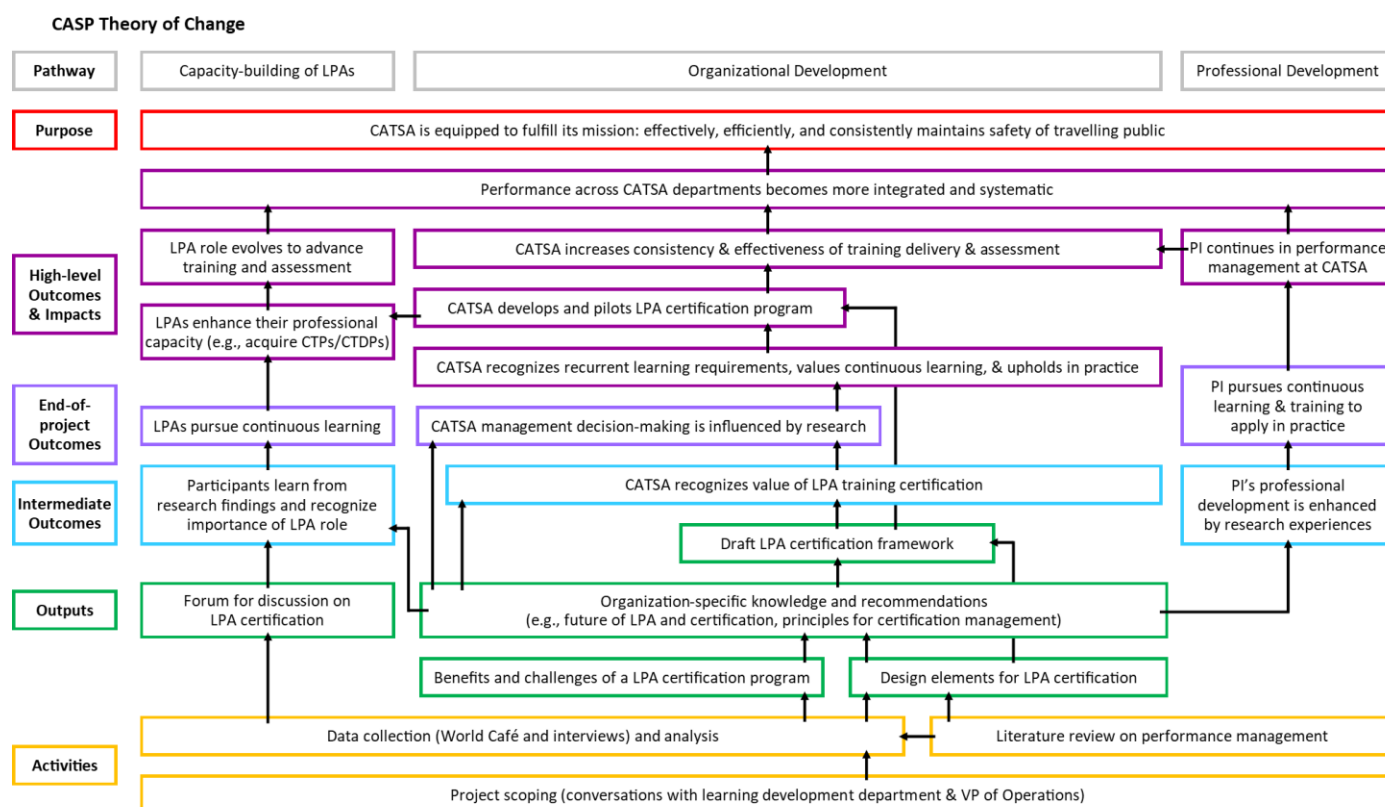
The research aimed to contribute to positive change through capacity-building and organizational learning through three interconnected pathways: an *organizational development* pathway, a *capacity-building* pathway for LPAs, and a *professional development* pathway. Each impact pathway intersects and complements the others to support the realization of outcomes. The key steps in these pathways are illustrated in Figure 1.

Within the *organizational development* pathway, the CASP engaged multiple levels of CATSA staff within the research activities and provided them with opportunities and a forum to discuss and reflect on key competencies and the future of the LPA role with other colleagues. As a result, CATSA staff were expected to gain greater appreciation for the value of LPA training certification in the context of supporting the efficiency and effectiveness of CATSA operations. By demonstrating the connection between continuous learning and effective

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<sup>1</sup> The QAF is not meant to be a measure of excellence, but rather characterizes the project design and implementation in terms of the degree of its transdisciplinarity.

practice through CASP findings, and aligning the recommendations with CATSA's mandate for continuous improvement, it was expected that CATSA's decision-making at the management level would be influenced to drive the improvement of trainers' standards. As a result, CATSA would value continuous learning and support continuous learning in practice. With the CASP demonstrating a need and willingness for these processes, CATSA was expected to recognise recurrent learning requirements for certain roles and drive the piloting of the draft certification framework produced as a research output. With a successful pilot, it was expected that LPAs would pursue other professional development opportunities and CATSA would develop process and protocol documentation and tools to further increase the consistency and effectiveness of training delivery and assessment. This in turn was expected to lead to LPAs having improved confidence and professional capacity. Overall, organizational emphasis on training was expected to lead to performance becoming more integrated and systematic across CATSA departments with staff being held to the same high standards.



**Figure 1.** Simplified CASP Theory of Change

Advancing performance opportunities for LPAs within the *capacity-building* pathway was expected to influence other departments and partners of CATSA. The synergistic interaction between these two impact pathways ultimately aimed to support screening effectiveness and safety. Opportunities for discussion and reflection with other LPAs supported by the CASP's World Café was expected to influence research participants' recognition of existing training and assessment gaps and gain knowledge of adult learning. With this recognition, combined with their passion for the job and desire to succeed, LPAs would be motivated to pursue continuous learning. With increased knowledge of the importance of adult learning, coupled with completion of the pilot certification program, it was expected that LPAs would be designated as Certified Training Professionals (CTP) and/or Certified Training and Development Professionals (CTDP). This was also expected to create further career progression opportunities, both within CATSA and outside of the organization within other training and evaluation roles. By sharing a draft certification framework with CATSA and engaging CATSA management in the research process, CATSA was expected to invest in the development of their employees (e.g., LPAs) that teach front-line staff (i.e., screening officers and service contractor trainers) in order to ensure quality performance, increasing ability, and safety.



Overall, the CASP intended to provide a significant *professional development* experience for the PI to expand their expertise and professional recognition as a performance management expert at CATSA. By engaging in the research experience from both a researcher and practitioner lens, the PI's professional development would be enhanced as the CASP provided an opportunity to grow leadership capacities and learn lessons. With reinforced values for adult learning gained from the research process, the PI was expected to pursue continuous learning and training to apply in their work and set more individuals up for success.

## Results

### Outcome Evaluation: To what extent and how were outcomes realized?

Table 1 summarizes the extent to which outcomes were realized. The CASP leveraged multiple impact pathways and mechanisms to realize outcomes. Outcomes in the *organizational development* pathway were realized through the involvement of key stakeholders in the data collection process, by co-producing knowledge, and strengthening coalitions. As an action research project, the CASP involved all key stakeholders throughout the research process to ensure a multi-perspective understanding was developed and provide co-ownership over the draft LPA certification framework. By gaining organizational support for the CASP at project inception and leveraging the PI's insider status as Regional Manager of Learning and Development, knowledge was successfully transferred throughout CATSA. The CASP supported the *capacity-building of LPAs* by involving them in the research process, enabling knowledge transfer on topics about adult learning, recognition of training and assessment gaps, and motivation to complete the pilot certification process. Capacity-building of LPA outcomes were mostly fully realized and supported outcomes in the *organizational development* pathway. The CASP provided an opportunity for the PI to develop their leadership skills, and become equipped with new knowledge, skills, and perspectives to apply in their future work in performance management at CATSA.

**Table 1.** Summary of outcome realization and CASP contributions

Outcome	Assessment
CATSA recognizes value of LPA training certification [intermediate outcome]	Realized, clear project contribution
Participants recognize importance and contribution of LPA role [intermediate outcome]	Realized, clear project contribution
CATSA management decision-making is influenced (principles of continuous learning, trainers' standards) [EoP outcome]	Realized, clear project contribution
Research methods adopted into the organizational process [EoP outcome]	Realized, clear project contribution
Participants recognize training and assessment gaps [intermediate outcome]	Realized, clear project contribution
Participants gain knowledge of adult learning [intermediate outcome]	Partially realized, clear project contribution
LPAs pursue continuous learning [EoP outcome]	Realized, clear project contribution
PI's professional development is enhanced by research experiences [intermediate outcome]	Realized, clear project contribution
PI continues using methods learned at RRU (e.g., appreciative inquiry, action research, and experiential learning) [EoP outcome]	Realized, clear project contribution

A number of unexpected outcomes emerged during and after the CASP. These were documented within the project ToC and discerned in collaboration with the PI given the time that has elapsed since the end of the CASP. These unexpected outcomes were analyzed as part of the outcome evaluation. There were few other unexpected outcomes identified by informants. However, one informant discussed how the application of a standardized program for service contractors resulted in the loss of some Service Contractor Trainer (SCTR) staff. The standardized program highlighted individuals who were not the right fit for the job and supported trainers to operate to the best of their ability. Unexpectedly, the CASP was used as an exemplar project in the MAL program at RRU, which has supported other students to learn from and create meaningful research projects that support organizational change. Few negative outcomes were discussed by informants other than the potential loss of some SCTR staff.

## **Alternative Explanations of Outcome Realization**

It is difficult to separate outcomes resulting from the CASP and those resulting from the PI's ongoing work on the topic within CATSA. The PI continued to contribute to changes within CATSA following the CASP to support increased consistency and effectiveness across airport screening operations.

Some alternative explanations for outcome realization were raised by interview informants. For example, other individuals working alongside the PI in the Learning and Development Department also have focused their efforts on developing standardized courses across other CATSA regions. The Learning and Development Department also completed their own research on human factors within security to support and address these within training programs delivered by LPAs to amend and prepare curricula. Other alternative explanations include public pressure that drives a continuous response from CATSA to improve screening operations and accommodate evolving threats. As a learning organization, CATSA has continually supported professional development of staff by offering courses and training workshops to build staff capacities. Some informants also discussed challenges relating to the government budget deficit reduction and changes in organizational structure which resulted in the loss of momentum behind the draft certification framework. However, resource limitations also highlighted the importance of ensuring professional standards throughout CATSA and elements of the CASP have been used in other CATSA initiatives such as the onboarding checklist.

## **Project Assessment: What elements of the research design and implementation supported outcome realizations, and how?**

The QAF assessment reveals that the CASP's design and implementation align with many principles and criteria of relevant, credible, and legitimate research that is well-positioned for use, and produced knowledge that is useful and used (see Appendix 5 for QAF results and justifications for the project assessment).

Under the relevance principle, the CASP clearly defined the problem context and identified research entry points drawn from analysis of the problem context and the PI's personal experience as a former LPA. The CASP addressed a socially relevant research problem and identified a clear gap as the topic was highly specialized. The practical gaps of the research problem were relevant for CATSA and affected LPAs due to the need for systemic accreditation of the LPA role. The research problem also aligned with CATSA's organizational purpose and the need for the organization to continually evolve to keep up with changes in technology and threats to security. The PI strategically and successfully communicated with senior management for buy-in and sponsorship of the research. The collaborative action-oriented research approach involved LPAs, as the actors under study, in the development of a certification program for the LPA role. These characteristics supported co-ownership over CASP outputs. However, the CASP did not utilize an explicit or documented ToC and assumptions underlying expected changes were not explicit; a fully articulated ToC would have improved the strength of the project and resulting thesis.

Regarding credibility, the PI interviewed key actors at the start of the CASP to foster buy-in with decision-makers and support joint problem formulation. Paired with a broad literature review, the research was based on a well-integrated theoretical and empirical foundation. The World Café method was an appropriate method to collect data from diverse participants and enable participant engagement with themes and data that came out of the interviews. Consultations with the advisory team supported reflection, and informants indicated that the PI was critical and reflexive in the design and implementation of the project. Research objectives are also not described in the CASP thesis, with a singular objective stated in the appendices; a better formulation of objectives would have aided the structure and purpose of the project. Overall, the PI had adequate competencies and position within CATSA to support the CASP.

Under legitimacy, the PI was aware of their own bias as a manager within CATSA and clearly distinguished their identity as a researcher from their role as Learning and Development manager. Informants perceived the CASP to be collaborative and appreciated how they were brought on as collaborators to develop the pilot LPA certification program. The CASP achieved "*mastery in the area of ethics*" (Res1) by adhering to RRU's Research Ethics Policy and Tri-council Policy. A section of the thesis is dedicated to ethical considerations for human

dignity, informed consent, privacy and confidentiality, justice and inclusiveness, reducing harm, and enhancing benefits. Overall, the CASP was collaborative, transparent, and ensured a sense of co-ownership over the LPA certification process to support CATSA's uptake and use of CASP findings and recommendations.

Regarding positioning for use, the CASP clearly contributed to the partial or full realization of all ten intermediate and EoP outcomes. The CASP resulted in positive outcomes for participants, LPAs, and CATSA, and was a direct catalyst for CATSA's pilot LPA certification program. The CASP emphasized the importance of the LPA role, setting standards, and ensuring consistency. Several LPAs successfully achieved their CTP/CTDP designation as a result of the pilot. The CASP also supported capabilities by allowing the PI to build upon their own research capacities, resulting in the transfer of these skills to other aspects of the PI's job. Although the CASP-developed certification program is not mandatory for LPAs because of organizational change outside of the project's control, CATSA has since standardized assessments that align with the PI's recommendations. Informants noted that the CASP set the standard for assessment within CATSA and opened the door for LPAs to achieve a level of subject matter expertise.

Evidence indicates RRU programming supported the realization of CASP outcomes in the *professional development* and *organizational development* pathways. RRU programming supported the PI in identifying key stakeholders who needed to participate in the research process and who are well-positioned to contribute to sustainable organizational change. The MAL program encouraged the PI to obtain a sponsor within CATSA to ensure buy-in for the CASP. RRU introduced the PI to action-based inquiry which provided the PI with the appropriate knowledge base to create an effective inquiry and engage effectively with stakeholders. The action-orientated nature of the MAL program targets the development of leadership skills and competencies to support students in accomplishing abilities specific to their role.

## **Lessons Learned**

### ***Project Lessons***

- Leveraging the PI's insider perspective of the organization, as well as their knowledge of the LPA role, supported effective data collection and uptake of the research outputs.
- Applying participatory methods with key system actors and target audiences can gather a diverse range of perspectives and ensure co-ownership of the project outputs thus increasing the likelihood for subsequent uptake and use.
- Utilizing an interdisciplinary approach ensured successful application of academic learning theories into the practical application of LPA assessment and certification.
- An in-depth understanding of how a project is expected to contribute to change (e.g., through ToC) can support recognition of further opportunities for potential impact.

### ***Contextual Lessons***

- Due to the nature of CATSA as a security organization, it is challenging for outsiders to complete research on operations or have access to participants. Future research in the context of CATSA and other security organizations should be led by those with an understanding of operations and in positions of trust within the organization to ensure buy-in from stakeholders, and support the uptake and use of research outputs and recommendations.
- No previous research had been completed to explore LPA assessment and certification strategies due to the specialized topic and context. Future research on highly specialized topics should also be grounded in interdisciplinary academic literature to support rigour and the transferability of findings.
- Participatory methods are important when researching assessment and certification due to notions of uncertainty that may arise within participants. Participatory methods such as World Cafés provides participants with the opportunity to ask questions and develop an assessment and certification process that was in-line with the necessary competencies for the LPA role.

## **Evaluation Limitations**

*Limitations of the analytical framework:* Having the PI identify informants to test outcomes can increase the risk of introducing bias into data collection as informants may be selected for their likelihood to reflect positively on the project's results and outcomes. To address this limitation, snowballing for additional perspectives and sources of information was undertaken and a variety of documents were reviewed. The period of time between the inceptions of the CASP and the development of the project ToC (i.e., more than ten years) also resulted in a number of unexpected outcomes being included within the ToC. This meant that the ToC development process relied greatly upon the PI's recall of the project.

*Limitations of the data and results:* Assessments using the Outcome Evaluation approach rely on informant perspectives, which can be affected by several factors, including time. Recall of project details and processes was difficult for many of the informants. There were also some challenges in separating outcomes related to the CASP from the PI's continued work on the topic. For example, the PI has contributed to a number of changes in CATSA over the past ten years in the Learning and Development Department aligned to the same purpose of the CASP, which is to support increased consistency and effectiveness across Canadian airport screening operations.

## **Recommendations**

Considering the results of the case study evaluation, we propose the following recommendations for the design and implementation of future research:

1. Leverage the PI's insider perspective, as well as in-depth knowledge of the context to support effective data collection (e.g., access to participants) and uptake of research outputs through aligning the research with organizational initiatives and mandate.
2. Utilize participatory methods with key system actors and target audiences to gather a diverse range of perspectives and ensure co-ownership over research outputs.
3. Interdisciplinary approaches can ensure the successful application of academic learning theories into practical application to support the rigor and transferability of findings to other contexts, particularly where there is minimal previous research on the topic.
4. Use a ToC to plan and monitor progress in order to support the recognition of further opportunities for potential impact
5. Future research in security organizations should be led by those with an in-depth understanding of the context and in positions of trust to ensure buy-in, applicability, and uptake of research outputs in order to contribute to sustainable organizational change.

## Introduction

This report presents an outcome evaluation of a research project undertaken by a Royal Roads University (RRU) Master of Arts in Leadership (MAL) student. The focus of the Certification of Airport Security Project (CASP) was to examine the Canadian Air Transport Security Authority's (CATSA) Learning and Performance Advisor (LPA) role and identify strategies for assessment and certification to maintain a standard of operation in line with the organizational mandate (Martens, 2009). CATSA is mandated with protecting the public through effective and efficient screening of air travelers and their baggage. CATSA's goal is to provide a professional, effective, and consistent level of security service across the country, at or above the standards set by Transport Canada (CATSA, 2021). The purpose of the CASP was to increase the integration and systematization of performance across CATSA departments. The CASP aimed to collaboratively create design elements for an LPA certification and uncover a multi-perspective understanding of key competencies for the future of the LPA role. The CASP intended to do this by building the capacity of LPAs, developing CATSA as an organization through training and certification, and supporting the professional development of the principal investigator (PI). This evaluation investigates the extent to which and how the CASP contributed to intended outcomes. The aim of the evaluation is to critically assess project design, implementation, and outcome contributions to elicit lessons from the project.

RRU has an explicit mission to teach and generate research that contributes to transformation in students and the world (RRU, 2019). The MAL program encourages the study of relevant real-world problems using interdisciplinary, multi-sectoral, and intercultural approaches to problem-solving for organizations, communities, and society (RRU, 2021). In order to uphold the University's mission and support continuous learning, it is critical to analyze the extent to which and how student research contributes to change and how programming facilitates those contributions. The Sustainability Research Effectiveness (SRE) program at RRU is dedicated to understanding how research contributes to social change, and how those contributions can be enhanced through improvements to research design, implementation, and adaptive management. The SRE program conducts a series of participatory outcome evaluations to support learning for research effectiveness.

This Master's research project is part of a wider assessment of RRU student projects to inform learning for more effective research at the graduate level, but also to inform planning for research effectiveness (Claus et al., 2021). The CASP was selected for its likelihood to make contributions to social change. It had a clearly stated problem; used contextually appropriate research design and methodology; included stakeholders or community members in the research process; and its conclusions demonstrated potential for outcomes.

The evaluation follows a participatory theory-based evaluation approach, using a theory of change (ToC) as the analytical framework. The ToC articulates the theoretical relationships and sequences of steps through which the research project intended to realize outcomes and impacts. The evaluation is an empirical test to assess the extent to which and how the intended outcomes modelled in the ToC were realized. Research design, implementation, and outputs are assessed using an adapted version of Belcher et al.'s (2016) Transdisciplinary Research Quality Assessment Framework (QAF). The QAF is used to highlight elements of the transdisciplinary research process that were sufficiently implemented by the CASP to support the realization of outcomes, and elicit learning on where future considerations could be made when designing and implementing transdisciplinary research (Belcher et al., 2016). The findings of the evaluation are grounded in broader theories of social change processes to explain how and why the project contributed to change.

The evaluation has three main objectives, to:

1. Assess the project's influence;
  - i. Document and test intended outcome realizations and pathways;
  - ii. Draw conclusions about the extent to which intended outcomes were realized and mechanisms of realization, with specific attention given to research project design and implementation;
2. Provide an opportunity for learning and reflection for researchers pertaining to promising research design and implementation practices, and lessons to guide future graduate research; and
3. Critically reflect on the evaluation methodology for future research project evaluations.

Outcome evaluations aim to assess two components of a research project: i) whether or not outcomes are realized; and ii) the extent of the project's contribution to outcome realization. The second component of assessing the project's contribution is especially challenging (Mayne, 2001; 2012; Forss, Marra, & Schwartz, 2011). When projects are situated in complex systems, with multiple actors and processes that affect outcomes in some way, the attribution to any one cause is not possible (Mayne, 2001; 2012). This evaluation acknowledges these challenges by explicitly considering alternative explanations for the documented results, seeking stakeholder perspectives, and applying expert judgement to assess the project's contributions.

Research contributions are typically framed in terms of new knowledge production, such as testing and improving theory and methods, conceptual framework development, and theoretical and empirical analysis, among others (Belcher, 2020). Increasingly, research-based knowledge contributions are solutions-oriented, providing information and options to improve policy and practice. In addition to knowledge, research activities can facilitate and support social processes of change, such as building social and scientific capacities, influencing public discourse and research agendas, and creating new fora or facilitating solution negotiations as ways to influence policy and practice (Belcher, 2020).

The presentation of the report begins with a brief overview of the CASP. The methodology section explains in detail the analytical framework used and how data were collected and analyzed to respond to the evaluation questions. The results section answers the evaluation questions using evidence collected from interviews and document review. The lessons learned section discusses the implications of the findings and what was learned from the case study evaluation. The recommendations section outlines considerations for future research based on the evaluation findings. The appendices provide supplemental information pertaining to the evaluation methods and results.

## **Case Study Overview**

CATSA's work focuses on air transportation system security, including passenger, baggage, and non-passenger screening (CATSA, 2021). With evolving terrorist threats, security and technology require and undergo continuous and rapid change. It is imperative that CATSA evolves as an organization to uphold its mission of protecting the public by securing critical elements of the air transportation system. LPAs are a vital part of CATSA's National Training and Certification Program (NTCP), which ensures and encourages continuous improvement and maintenance of highly skilled airport security at multiple levels. LPAs are responsible for training and testing screening officers on their abilities to ensure the safety of air travellers, airline staff, airport employees, and others who work in and travel through Canada's airports, and have the authority to grant screening officers certification according to CATSA's standards (CATSA, 2021). While LPAs are responsible for others' certification standards, at the time of the CASP, there were no certification standards for LPAs. CATSA's Learning and Development team grew substantially during this period, introducing new challenges in maintaining consistency of certification processes and course delivery across Canada (Martens, 2009). This organizational change resulted in an escalation of responsibility for the LPA role, which evolved to play a leading part in the training and evaluation of other positions related to screening officers, including the supervisors of service contractors. With this increased responsibility, evolution of the LPA role would also need to match changes in organizational growth, new technology, and ever-changing security threats, such that LPAs stay current and maintain a predetermined and measurable level of expertise. To realize CATSA's mandate for consistency, the CASP aimed to identify how the LPA role needed to evolve and proposed an LPA assessment and certification strategy.

Through use of an action research approach and by directly engaging stakeholders throughout the research process, the CASP aimed to examine the LPA role by identifying key competencies of the LPA role; the benefits and challenges of a certification program based on competency assessment; and the assessment methods LPAs believe were appropriate and could give a true assessment of their roles and responsibilities. The project also aimed to develop strategies for assessment and certification by examining adult learning techniques and evaluation methods through a literature review. With support of the organization, the CASP aimed to develop an

LPA certification program to provide new professional development opportunities for LPAs and subsequently guarantee a standard and level of consistency in the delivery and measurement of training. This was expected to add credibility to both the NTCP program and the role of LPAs. As CATSA continues to expand more positions in the field, the CASP intended to support career progression in providing specific assessment methods for various position competencies (Martens, 2009). As the Manager of Learning and Development for the Western Region at CATSA, and having begun their career as an LPA, the PI's familiarity with the role was expected to enable them to identify the need for a method of legitimising the position and instill a culture of continuous adult learning to uphold CATSA's mandate. The CASP intended to equip CATSA to fulfill its mission to effectively, efficiently, and consistently maintain the safety of the travelling public.

## Evaluation Methodology

A series of RRU Doctoral and Master's research projects were selected for evaluation through a systematic review process from an online repository. Seven selection criteria were applied, including: (1) a clearly stated problem/issue; (2) a socially relevant research question; (3) inclusion of community or other stakeholders; (4) an articulation of how the project would lead to expected outcomes (implicit or explicit ToC); (5) appropriate research design and application of methods; (6) conclusions with demonstrated potential for outcomes (e.g., provides applicable recommendations); and (7) completed within five years of primary data collection. The CASP was selected for its likelihood to contribute to social change. It fulfilled several of the above criteria in a document review of the abstract and thesis. For example, the CASP had a clearly stated problem; used contextually appropriate research design and methodology; included stakeholders in the research process; and its conclusions demonstrated potential for outcomes.

This evaluation examines whether and how the project contributed to organizational practice change and the capacity-building of key actors that would support CATSA to fulfill its mission. The assessment uses a theory-based evaluation approach to model the intended activities, outputs, outcomes, and impacts, test whether intended results were realized, and analyze the mechanisms of change.

The analysis was guided by the following questions:

### 1. Research Outcome Evaluation

- a. *To what extent and how were outcomes realized?*
- b. *Were there any positive or negative unexpected outcomes from this project?*
- c. *Could the outcomes have been realized in the absence of the project?*
- d. *Were the assumptions pertaining to why changes were expected sustained?*
- e. *Are the higher-level changes likely to be realized?*

### 2. Research Project Assessment

- a. *What elements of the research design and implementation supported outcome realization, and how?*
- b. *To what extent and how did the project engage effectively with relevant stakeholders?*
- c. *To what extent were the research findings sufficiently relevant to achieve the stated objectives?*
- d. *To what extent and how are target audiences aware of and using the project outputs?*
- e. *How does RRU support student success in research?*
- f. *What lessons about effective research practice can be learned from this case study?*

The evaluation follows a participatory theory-based evaluation approach, using a ToC as the analytical framework (Figure 2). The Outcome Evaluation method draws on the Payback Framework, Contribution Analysis (CA), and Outcome Mapping (OM), among others, to assess research contributions in complex socio-ecological systems (Belcher et al., 2020). It takes a systems perspective, acknowledging that any project operates in conjunction with other actors and social processes and recognizes that causal processes are often non-linear (Belcher et al., 2020). The ToC models the theoretical relationships and sequences of steps through which the research project intended to realize outcomes and impacts. It describes the causal relationships between a project's activities and results, and how these were expected to manifest in outcomes, focusing on the associated impact pathways, actors, and



steps involved in the change process (Belcher et al., 2020). The model works backward from long-term goals to identify the conditions that theoretically must be in place for the intended high-level results to occur (Belcher et al., 2020). The framework is also used to identify indicators and the necessary evidence needed to assess actual changes against expected outcomes at each stage.

The approach draws on OM's explicit recognition that the relative influence of a project or program declines the further it moves from the project boundary (Belcher et al., 2020). For example, a project's influence declines as the project moves from its activities (sphere of control) and who they work with (sphere of influence) to the improved conditions it hopes to realize (sphere of interest) (Belcher et al., 2020). Another key concept borrowed from OM is the focus on outcomes that are proximate to the intervention and occur within the sphere of influence (Belcher et al., 2020). We conceptualize outcomes as changes in knowledge, attitude, skills, and relationships (KASR). A key element of the Outcome Evaluation approach is the explicit distinction of end-of-project (EoP) outcomes, defined as ambitious but reasonable to expect within the timeframe and resources of the project (Belcher et al., 2020). By modelling the ToC, the Outcome Evaluation method makes relationships between what the project does (activities and outputs) and its aims (outcomes and impacts) explicit. Assumptions are also documented to explain why a change is expected to occur in a particular circumstance. These explicit assumptions can then be tested to inform learning about how a particular change occurs under the conditions of the project and context within which it is situated (Belcher et al., 2020). The Outcome Evaluation method also builds on the RAPID approach by gathering participant and stakeholder perspectives to assess the contribution of various factors, activities, and outputs within a change process. The method also follows the CA approach of articulating and testing alternative hypotheses that can explain key changes (Belcher et al., 2020).

### **ToC Documentation**

The CASP did not have an explicit ToC in place. Therefore, as a first step, a participatory ToC workshop was held with the PI in June 2019. During the workshop, the SRE team worked with the PI to document the implicit ToC for the CASP. The evidence required to empirically test whether or not the outcomes were realized was also identified during this session. Data needed to assess each outcome and potential data sources were organized in an evidence table.

### **Data Collection**

Mixed-methods were used to collect the breadth of data needed for a comprehensive outcome evaluation. Data were collected through a review of seven documents (including project e-mail correspondence, organizational documents, and the CASP thesis) and 17 semi-structured interviews with 18 informants from two different informant categories (Table 2) (see Appendix 1 for a full list of data sources).

**Table 2.** Informant and interview details

<b>Informant Group</b>	<b>Number of Interviews Conducted</b>
Researcher	2
Practitioner	16
<b>Total</b>	<b>18</b>

Interview questions were formulated to ascertain informant perceptions of the problem context, key challenges and developments, decision-making, and the project's approach and contributions (see Appendix 2 for the interview guide). Interviews were recorded with informants' permission and transcribed. Snowballing from former project participants for additional perspectives and sources of information was undertaken. The evaluation team maintains commitment to the anonymity of these and all evaluation informants by removing identifying information from interview transcripts and evidence presented in this report.

### **Analysis**

All evidence was coded thematically and analyzed using NVivo to systematically organize data corresponding to the evaluation questions. Deductive coding was employed using codes adapted from previous evaluation experiences and new codes framed by the specific intended outcomes of the project highlighted by the ToC. The



coding process organizes objective and subjective data from a variety of sources to help understand contextual factors, project contributions, and how outcomes were realized. Two codebooks were used: one to analyze outcome realization; and one to assess elements of research design and implementation (see Appendix 3).

The evaluation team supplemented the research design and implementation assessment by scoring the CASP according to an adapted version of Belcher et al.'s (2016) Transdisciplinary Research Quality Assessment Framework (QAF) to assess the degree to which the project employed transdisciplinary characteristics. The QAF organizes criteria for assessing research design and implementation under the four principles of Relevance, Credibility, Legitimacy, and Positioning for Use. Relevance refers to the appropriateness of the problem positioning, objectives, and approach to the research for intended users. Credibility pertains to rigour of the design and research process to produce dependable and defensible conclusions. Legitimacy refers to the perceived fairness and representativeness of the research process. Positioning for Use refers to the utility and actionability of the research's knowledge and social process contributions. Full definitions of the criteria can be found in Appendix 4. Four evaluators reviewed project documentation and interviews prior to scoring. Each evaluator scored the criteria independently on a Likert scale (0 = the criterion was not satisfied; 1 = the criterion was partially satisfied; 2 = the criterion was completely satisfied); and averages were calculated for final scores. The scores indicate characteristics that were either strong, present but incomplete, or absent in the project.

Typically, ToCs guiding research projects lack grounding in available applied theory about how and why changes occur. To address this shortcoming and in an effort to build more theoretical understanding for project contributions to outcomes, results of the outcome analysis are grounded in theories of social change processes to better understand the theoretical explanations of why changes did or did not occur. We apply theoretical principles from stakeholder theory (Freeman, 1984), social capital theory (Putnam, 2000), and situated learning theory (Lave and Wenger, 1991) to help explain why expected changes did or did not occur in the case of the CASP and test whether project assumptions were sustained. These social theories were selected as they are appropriate to the project context and support the casual logic to ground the ToC within relevant theory.

### **CASP Theory of Change**

The CASP ToC that was developed collaboratively with the PI (Figure 2) illustrates how the PI hypothesized the project's contributions to change at the time of the evaluation. While the project could not anticipate how outcomes would manifest, there were deliberate aspects of the research design and implementation that allowed the project to be responsive to and generate opportunities to support outcome realization.

### **CASP Activities and Outputs**

The CASP undertook several scoping activities, including conversations with the Learning and Development Department and the Vice President of Operations for joint problem identification and to discuss their perspectives on priority elements of LPA evaluation and certification and possible challenges. In addition, the PI conducted a literature review on performance management techniques, including different approaches to measuring and assessing competencies, benefits and challenges of competency assessment, organizational learning, and success factors in adult learning. As part of the data collection, three interviews were held with internal CATSA staff (i.e., a LPA, a manager from the Learning and Development Department, and a human resources manager) to discuss positive experiences with assessment; their opinions on the desired future for the LPA position; key competencies of the LPA role; the benefits and challenges of assessment/certification specific to the role of the LPA; methods for assessing LPA competencies; and how they envision training and development playing a role in LPA assessment and certification. Following the interviews, the PI held a World Café with 35 participants (attended by 90% of the LPAs from all regions in Canada and 89% of staff from the Learning and Development Department) to obtain a collective and diversified voice of LPAs and identify critical elements for the LPA certification program. World Café questions were informed by preliminary findings and themes discussed in earlier interviews.

The thematic analysis and triangulation of academic literature and primary data produced outputs on design elements for a LPA certification program; multi-perspective understandings of key competencies for the LPA

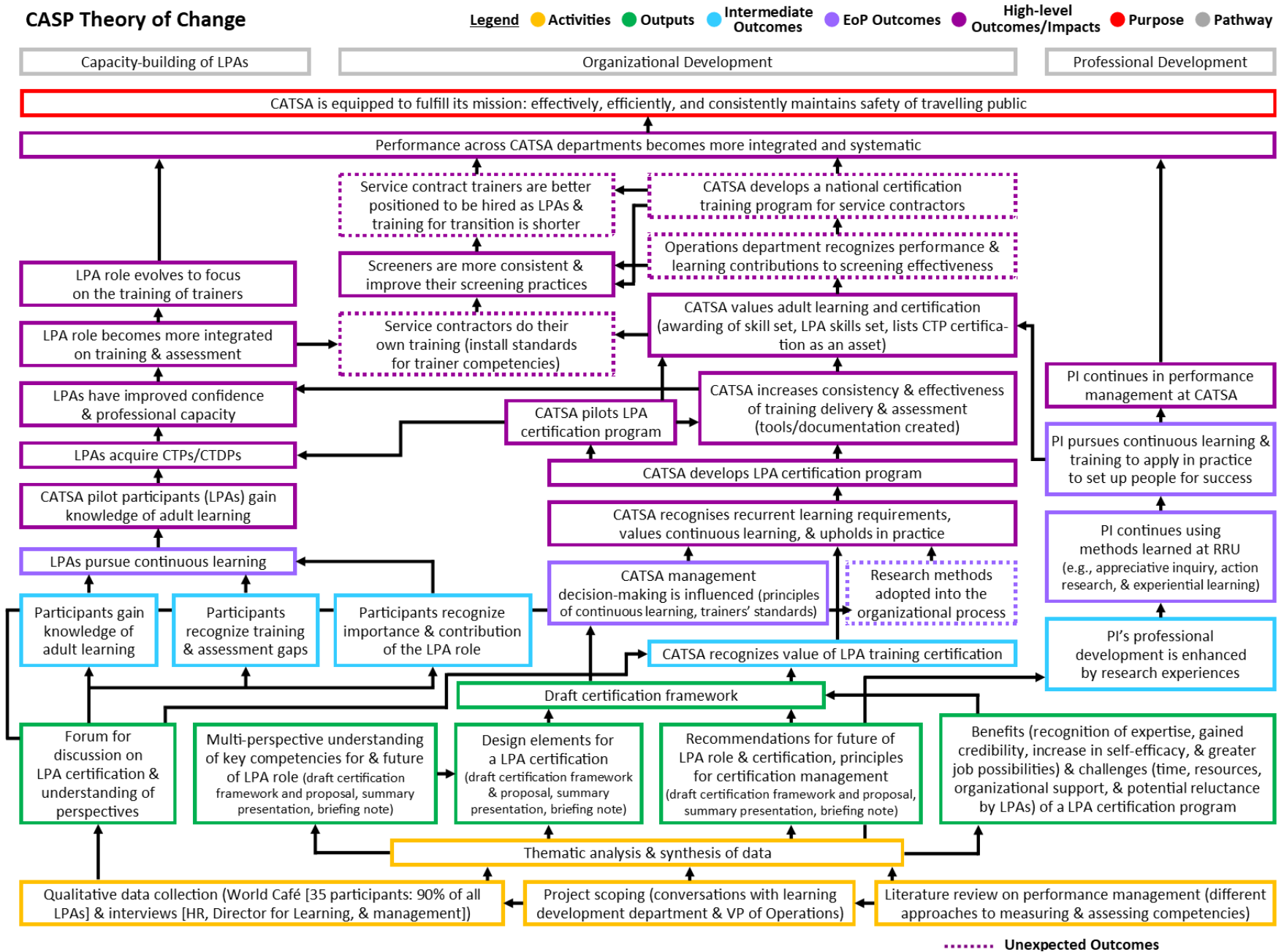


Figure 2. Elaborated CASP Theory of Change

role; benefits and challenges of a LPA certification program; and expectations and recommendations for the future role and certification of LPAs. These recommendations, targeted toward CATSA's Training and Delivery Management Group and management, called for relevant assessments and experiential continuous learning with immediate application to the LPA role; a flexible framework to meet a variety of needs and change over time; and a clear communication strategy complete with business processes. The World Café provided a forum for discussion on LPA certification and helped build understanding of internal CATSA staff perspectives on LPA certification and assessment. A briefing note, which contained the research findings and recommendations, was produced as an output and shared with CATSA management. A summary presentation given to LPAs across Canada and the Training and Delivery Management Group was held to share the research findings and outline the conclusions and certification program recommendations. Out of these conclusions and recommendations, a draft certification framework was created in collaboration with the Training and Delivery Management Group, which was then presented and discussed with management, Learning and Development managers, and the Learning and Development Department.

### **Intended Outcomes**

The CASP aimed to contribute to outcomes and impacts through three interconnected pathways: an *organizational development* pathway, a *capacity-building of LPAs* pathway, and a *professional development* pathway. Each impact pathway identified within the ToC intersects and complements the others to contribute to outcomes. For example, *organizational development* can be viewed as an overarching pathway for the other pathways. As CATSA begins to value adult learning and certification, it was expected that this initial organizational change would stimulate demand for more LPA capacity-building. In addition, engagement through and participation in the research process was expected to influence the *capacity-building of LPAs*. The research experience, the subsequent organic process of change stimulated by the development of CATSA's LPA certification program, and the integration of continuous learning and training in the PI's performance management role at CATSA were expected to function as a *professional development* opportunity. The cumulation of these pathways and their associated activities and outcomes were expected to support the fulfillment of CATSA's mission to effectively, efficiently, and consistently maintain the safety of the travelling public.

### **Organizational Development**

One impact pathway relates to *organizational development* at CATSA. By engaging multiple levels of CATSA staff within the research activities and providing them with opportunities and a forum to discuss and reflect with colleagues on key competencies and the future of the LPA role, it was expected that CATSA staff (including Learning and Development staff, LPAs, and management) would gain greater appreciation for the value of LPA training certification. By demonstrating the connection between continuous learning and effective practice through CASP's findings and aligning the recommendations with CATSA's dedication to effectiveness and mandate for continuous improvement, it was expected that CATSA's decision-making at the management level would be influenced to reflect principles of continuous learning and drive the improvement of trainers' standards by the end of the project. As a result, it was expected that CATSA would value continuous learning and support it in practice. With organizational interest in improvement and clear demonstration of the need and willingness for these processes through the scoping and World Café discussions, it was expected that CATSA would recognise recurrent learning requirements for certain roles. This was expected to drive the piloting of the draft certification framework produced as a research output. With a successful pilot, it was expected that LPAs would pursue other professional development opportunities (*capacity-building of LPAs* pathway). with the combination of the pilot experience and CASP findings highlighting LPA certification and assessment gaps, it was expected that CATSA would develop resources for process and protocol documentation and new tools (e.g., facilitation guides, assessment guides) to increase the consistency and effectiveness of training delivery and assessment. Through project and pilot exposure, it was expected that CATSA would recognize Certified Training Professional/Certified Training Development Professional (CTP/CTDP) certification as an asset and give greater emphasis to adult learning. Overall, organizational emphasis on training was expected to integrate and systematize performance across CATSA departments.

With an increase in LPA consistency and with Service Contractor Trainers (SCTRs) being held to a similar standard as a result of improved learning, new tools, and recognition of performance and learning implications for screening effectiveness within the Operations Department, it was expected that screeners would become more consistent and improve their screening practices.

### ***Capacity-building of LPAs***

Another impact pathway involves the *capacity-building of LPAs*, which was intended to augment professional development opportunities for LPAs and support screening effectiveness. Advancing performance opportunities for LPAs was expected to influence other departments and partners of CATSA (*organizational development* pathway). The synergistic interaction between these two pathways ultimately aimed to support screening effectiveness and safety.

By taking part in the World Café, research participants had the opportunity to discuss and reflect with colleagues on the topic of LPA certification, raise attention to their values regarding certification and assessment, and set an agenda for moving forward (i.e., building commitment towards the establishment of a certification program in the future). This discussion, focusing on the possibilities for the LPA role in the future and how LPAs could better position themselves to be viewed as learning and performance specialists, was expected to lead to research participants (including LPAs) recognizing the importance and contributions of the LPA role. Opportunities for discussion and reflection with colleagues were also expected to result in recognition of training and assessment gaps. Participants were expected to gain knowledge of adult learning through discussions on how LPAs could be assessed for certification and how they envision continuous learning as part of this certification. With this recognition, combined with LPAs passion for their work and desire to succeed, it was expected that LPAs would pursue continuous learning opportunities (e.g., CTP/CTDPs). As LPAs participate in CATSA's pilot certification program and pursue other avenues of continuous learning, it was expected that LPAs would gain confidence and build specialized professional capacities. Moreover, LPAs would have access to new resources developed by CATSA (*organizational development* pathway) to use within their day-to-day work. As part of the reorganization of CATSA and the incorporation of LPA representatives in the local decision board, and the increased expertise, professional capacity, and confidence of the LPAs, the LPA role was expected to become more integrated as LPAs have the capacity to consult more on training and learning as they receive recognition for their expertise. This was also expected to create further career progression opportunities for LPAs both within CATSA and outside of the organization within other training and evaluation roles. Subsequently, this was expected to result in the LPA role evolving to include focus on the training of trainers. By sharing a draft certification framework with CATSA and engaging CATSA management in the research process, CATSA was expected to invest in the development of their employees (e.g., LPAs) that teach front-line staff (i.e., screening officers and service contractor trainers) in order to ensure quality performance, increasing ability, and safety.

### ***Professional Development***

Overall, the CASP intended to provide a significant professional development experience for the PI to expand their expertise and professional recognition as a performance management expert at CATSA. By engaging in the research experience from both a researcher and practitioner lens, the PI's professional development would be enhanced as the CASP provided an opportunity to grow leadership capacities and learn lessons based on reading, personal experience, and others' experiences, as well as lessons that were unexpected. For example, the PI discovered the challenges of being a researcher within their own workplace and the possible biases related to the researcher's own position. By the end of the project, it was expected that the PI would continue to use methods learned at RRU, such as appreciative inquiry, action research, and learning from research experience, within their day-to-day role at CATSA. With reinforced values for adult learning gained from the research process, it was expected that the PI would pursue continuous learning and training to apply in their work in order to set more individuals up for success. Subsequently, the PI would continue to work in performance management at CATSA, which was expected to influence the direction of performance within the organization and support the fulfillment of CATSA's mission to effectively, efficiently, and consistently maintain the safety of the travelling public.

### ***Unexpected Outcomes***

The CASP also contributed to a number of unexpected outcomes within the *organizational development* pathway which were not originally anticipated by the PI. As the project was completed over ten years ago, unexpected outcomes that materialized will be assessed to understand the processes that contributed to their realization. This section will outline the logic of these outcomes and discuss how they occurred.

By participating in the World Café, staff appreciated the value of a forum for discussion and subsequently adopted the World Café method into organizational processes. The CASP identified the value of continuous adult learning, which influenced the Operations Department to recognize performance and learning contributions to screening effectiveness. This led to the re-evaluation of role performance in other departments at CATSA, prompting the organization to consider integrating performance training and/or certification for other roles. This also influenced CATSA's partners, as the organization developed a national certification program for service contractors. Overall, organizational emphasis on training led to performance becoming more integrated and systematic across CATSA departments. As professional expectations increased for LPAs and subsequently crossed over to SCTRs, and as CATSA recognised the value of adult learning and certification through the development of a national certification training program for service contractors, service contractors emulated the LPA certification process and began to conduct their own training and install standards for trainer competencies. As expertise increased at all levels, SCTRs became eligible for new opportunities and were better positioned to be hired as LPAs.

### **Assumptions**

Assumptions were documented for each outcome and then aggregated to the project level according to common themes. The ToC rests on the following eight assumptions:

1. The CASP exposes informants to interdisciplinary perspectives on the topic (theoretical)
2. Partners are receptive to and develop an interest in the topic (contextual)
3. The PI's insider perspective within the organization positions them well to influence change (theoretical)
4. The research demonstrates the value of participatory methods which are applied by the organization and the PI in their future work (theoretical)
5. The recommendations are useful, practical, and accessible for implementation, and were sufficiently rigorous to be taken seriously (theoretical)
6. There is a need for improved organizational policy and practice to ensure consistency and continuous learning are instilled in the organization (contextual)
7. Facilitating co-generation and mutual learning processes through the research generated benefits and reflection for all parties involved to improve practices (theoretical)
8. A Master's degree holds universal recognition and provides the opportunity to expand on research capacities and topical expertise (theoretical)

## Results

### Outcome Evaluation

#### To what extent and how were outcomes realized?

##### *Extent of Outcome Realization*

Detailed results and supporting evidence of outcomes are provided in Appendix 6. The CASP clearly contributed to the partial or full realization of all ten intermediate and end-of-project outcomes. All intermediate and end-of-project outcomes relating to *organizational development* at CATSA were realized, which resulted in CATSA recognizing the value of LPA training certification and adopting research methods into organizational practice. Most outcomes relating to the *capacity-building of LPAs* were partially or fully realized and focused on CASP participants recognizing their own training and assessment gaps through the research process. There was minimal evidence to suggest that participants gained knowledge of adult learning resulting in this outcome being recognized as partially realized; however, some participants discussed how the CASP process enabled them to understand the difference between training and advising which has supported them within their role. This increased knowledge and understanding also supported LPAs in pursuing continuous learning. Intermediate and end-of-project outcomes relating to the *professional development* of the PI were realized through the research process and personal drive to improve in their role at CATSA.

We summarize the findings of the outcome evaluation in Table 3. Figure 3 illustrates the assessment of outcome realizations using the ToC.

**Table 3.** Summary of the CASP outcome assessment, supporting evidence, and consideration of contextual factors and causal mechanisms affecting outcome realization (see Appendix 6 for a more detailed assessment).

Results	Illustrative Evidence	
Outcome Assessment	Summary of supporting evidence for the assessment	Contextual factors and causal mechanisms affecting how the outcome was realized
<b>Organizational Development Pathway</b>		
CATSA recognizes value of LPA training certification [intermediate outcome] <b>Realized, clear project contribution</b>	<ul style="list-style-type: none"> <li>CATSA staff who participated in the World Café did reflect more on key competencies and the future of the LPA role (interviews, documents)</li> <li>The CASP gained organizational support for the need for a standardized training program for LPAs (justified by the standards already in place for other security operations (e.g., screening officers) (interviews)</li> <li>Uptake and implementation of the pilot certification process by CATSA implies recognition of the value of LPA training certification (interviews, documents)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>The CASP engaged multiple levels of CATSA staff in research activities supporting reflection</li> <li>The CASP aligned with the Learning and Development Department's philosophy for continuous learning and improvement</li> <li>The CASP provided CATSA with the opportunity to “walk the walk” in relation to competency assessment, the maintenance of consistent standards, and the provision of opportunities for improvement</li> </ul> <p>Alternative explanations:</p> <ul style="list-style-type: none"> <li>CATSA were supportive of professional development prior to the CASP and offered informal training to LPAs to support them in developing their careers (e.g., workshops, programs, courses etc.)</li> </ul>

<p>Participants recognize importance and contribution of LPA role</p> <p>[intermediate outcome]</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• Greater recognition of LPA's knowledge and expertise, and increased credibility of LPAs within the organization following the CASP (interviews)</li> <li>• Senior CATSA staff were able to reflect on the LPA role and the type of competencies needed to succeed within the role through CASP engagement (interviews)</li> <li>• Informants indicated there is increased recognition in the value of the LPA role by CATSA (interviews): <ul style="list-style-type: none"> <li>• Created a concrete definition on the skills required by LPAs</li> <li>• Establishment of the pilot certification program highlighted that a LPA is a specialized role (e.g., not everyone could do the job)</li> <li>• LPAs that participated in the pilot certification program attested to recognizing the importance of the position and the need for nation-wide consistency</li> </ul> </li> <li>• Informants noted that the CASP raised the importance of the LPA role, having a level of consistency across the role, and monitoring consistency (interviews)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• Taking part in the World Café provided CASP participants with the opportunity to reflect with colleagues on the LPA role and certification</li> <li>• How the CASP demonstrated the importance of the LPA role increased awareness of the LPA role to set a high standard for new screening officers</li> </ul>
<p>CATSA management decision-making is influenced (principles of continuous learning, trainers' standards)</p> <p>[EoP outcome]</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• CATSA managers saw LPA certification as an opportunity for LPAs to stay current and discussed the need for continuous learning (interviews) <ul style="list-style-type: none"> <li>• Managers supported the pilot LPA certification program developed by the CASP (interviews, documents)</li> </ul> </li> <li>• CATSA piloted the LPA certification program in the PI's region (interviews, documents) <ul style="list-style-type: none"> <li>• Pilot results were shared with other CATSA regions across Canada (interviews, documents)</li> </ul> </li> <li>• Without organizational cuts, informants hypothesized that the CASP would have had a long-lasting effect on CATSA management decision-making on continuous learning and trainers' standards (interviews)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• The CASP findings demonstrated the connection between continuous learning and effective practice</li> <li>• The CASP findings were aligned with CATSA's dedication to effectiveness and continuous improvement</li> </ul> <p>Barriers:</p> <ul style="list-style-type: none"> <li>• Following government deficit reduction, the Learning and Development Department faced a number of budget cuts which subsequently affected training</li> </ul> <p>Alternative explanations:</p> <ul style="list-style-type: none"> <li>• Following organizational cuts, senior staff reflected on the LPA role to identify desired competencies which resulted in the onboarding checklist and competency assessment</li> </ul>
<p>Research methods adopted into the organizational process</p> <p>[unexpected EoP outcome]</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• Research methods, such as World Cafés, have been adopted into organizational practice at CATSA and have expanded into the organizational practice of Service Contractors (interviews, documents)</li> <li>• The PI adopted action research methods into other work at CATSA to support the constantly adapting and evolving organization (interviews, documents)</li> <li>• The PI adopted the use of pilots into their organizational practice to test new initiatives before implementation (interviews, documents)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• CATSA was first exposed to World Cafés through the CASP <ul style="list-style-type: none"> <li>• By participating in the CASP's World Café, CATSA staff learned about the method and appreciated its value as a forum for discussion</li> </ul> </li> <li>• The PI was a driving force behind the implementation of World Cafés into CATSA organizational practice by introducing them into the Prairies region</li> </ul>

<b>Capacity-building of LPAs Pathway</b>		
Participants recognize training and assessment gaps [intermediate outcome] <b>Realized, clear project contribution</b>	<ul style="list-style-type: none"> <li>LPA participants reflected positively on the CASP, indicating that the project enabled them to recognize gaps in consistency across the role (interviews)</li> <li>The pilot certification program provided more motivation for LPAs to fill these assessment and certification gaps (interviews)</li> </ul>	Facilitating factors: <ul style="list-style-type: none"> <li>The nature of the LPA role means individuals strive to teach to the best of their ability and improve when gaps are identified</li> <li>Opportunities for discussion and reflection provided by the CASP supported participants to recognize training and assessment gaps</li> </ul>
Participants gain knowledge of adult learning [intermediate outcome] <b>Partially realized, clear project contribution</b>	<ul style="list-style-type: none"> <li>LPAs who completed the pilot certification program gained knowledge of adult learning (interviews)                             <ul style="list-style-type: none"> <li>Pilot participants learned about the difference between training and advising within the LPA role (interviews)</li> <li>Certified LPAs are noted to have a greater understanding of the depth and need for the advisory piece within their position (interviews)</li> </ul> </li> <li>Managers encourage LPAs to complete additional training to further their learning and professional development (interviews)                             <ul style="list-style-type: none"> <li>LPA certification supported LPA career progression (e.g., as trainers, facilitators, and advisors)</li> </ul> </li> </ul>	Facilitating factors: <ul style="list-style-type: none"> <li>CASP participants were exposed to concepts of adult learning through the research activities                             <ul style="list-style-type: none"> <li>Opportunities for discussion and reflection on adult learning with colleagues through the World Café arose in discussion on how LPAs could be assessed for certification</li> </ul> </li> <li>Pilot participants were exposed to different forms of adult learning through the pilot certification program process</li> </ul>
LPAs pursue continuous learning [EoP outcome] <b>Realized, clear project contribution</b>	<ul style="list-style-type: none"> <li>Six LPAs in the West region of CATSA (now the Prairies and Pacific) completed the pilot certification program and were certified by the CSTD to attain their CTDP designation (interviews)                             <ul style="list-style-type: none"> <li>Completing the pilot certification process provided some LPAs with the motivation and self-esteem to continue to develop within their roles (interviews)</li> </ul> </li> <li>Certified LPAs are required to complete yearly continuous learning to maintain their certification (interviews)</li> <li>LPAs also pursue continuous learning through university courses, attending seminars, and webinars, etc. (interviews)</li> <li>Continuous learning for LPAs is now a part of CATSA's organizational culture (interviews)</li> </ul>	Facilitating factors: <ul style="list-style-type: none"> <li>Expectations for continuous learning for screening officers set a precedence to develop standards of continuous learning in the LPA role</li> <li>CATSA supports continuous learning of LPAs and offers a variety of continuous learning opportunities</li> <li>LPAs have a desire to pursue continuous learning because of their passion for the job and motivation to succeed</li> </ul> Barriers: <ul style="list-style-type: none"> <li>Not all LPAs were fully committed to the pilot assessment and certification process which resulted in not all LPAs achieving their CTP status</li> <li>Limited time and resources are the main obstacles affecting LPA's continuous learning</li> </ul> Alternative explanations: <ul style="list-style-type: none"> <li>The LPA annual continuous learning plan was a feature of the role prior to the CASP and remains a requirement at present</li> </ul>



<b>Professional Development Pathway</b>		
<p>PI's professional development is enhanced by research experiences</p> <p>[intermediate outcome]</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>The PI grew their leadership capacity and learned important lessons that could be utilized within their future work, both professionally and personally (documents)                             <ul style="list-style-type: none"> <li>For example, the PI became further aware of the benefit of training and certification and has developed an enhanced value for continuous learning (personal communication)</li> </ul> </li> <li>The PI lead the pilot certification process (personal communication)</li> <li>The PI learned the value of understanding different perspectives before implementing new initiatives (documents)</li> <li>The PI built new research skills (interviews, documents)</li> <li>The PI overcame challenges encountered during the research process, and grew as a result (interviews)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>The PI had buy-in from CATSA management and decision-makers to use CATSA as a case study for their Masters research                             <ul style="list-style-type: none"> <li>Conducting research within the PI's own organization was advantageous for implementing activities, observing progress, and benefiting from the results</li> </ul> </li> <li>The CASP provided the opportunity for the PI to grow leadership capacities and learn lessons based on reading, personal experience, and others' experience, as well as encounter unanticipated lessons</li> </ul> <p>Barriers:</p> <ul style="list-style-type: none"> <li>Completing the CASP within the PI's own organization presented a number of challenges (including the need to separate the research from the PI's managerial position)</li> </ul> <p>Alternative explanations:</p> <ul style="list-style-type: none"> <li>The PI already held a leadership position as a Regional Manager of Learning and Development</li> </ul>
<p>PI continues using methods learned at RRU (e.g., appreciative inquiry, action research, and experiential learning)</p> <p>[EoP outcome]</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>The PI approaches tasks with the "plan, act, observe, reflect" outlook learned at RRU (interviews, documents)</li> <li>The PI continues to utilize methods learned through the MAL program in their current role at CATSA (personal communication)                             <ul style="list-style-type: none"> <li>e.g., use of action research and stakeholder engagement methods to support organizational change (interviews, documents)</li> </ul> </li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>The PI was exposed to diverse research methods through the MAL program at RRU and had the opportunity to test and apply them in the CASP</li> <li>As the PI is responsible for continuous improvement in their region, action research fits well as a tool to encourage stakeholder engagement and organizational change</li> </ul>
<p>PI pursues continuous learning and training to apply in practice to set up people for success</p> <p>[EoP outcome]</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>The PI pursues continuous learning and training by reading up on the latest academic literature, which has informed LPA practice (interviews)</li> <li>The PI continues to set LPAs up for success in order to perform to the best of their ability (interviews)                             <ul style="list-style-type: none"> <li>Setting LPAs up for success has a spillover effect on screening officers, who continuously improve and operate to a professional standard (interviews)</li> </ul> </li> <li>The PI has utilized their continuous learning to coach and mentor other CATSA staff to support effectiveness (interviews)</li> <li>Informants would not have been as successful in their roles without the PI's support and in-depth knowledge of the topic (interviews)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>The PI is passionate about their role as a Regional Manager of Learning and Development, and supports LPAs to find answers and achieve to the best of their abilities</li> <li>The CASP reinforced the PI's values for adult learning</li> </ul>

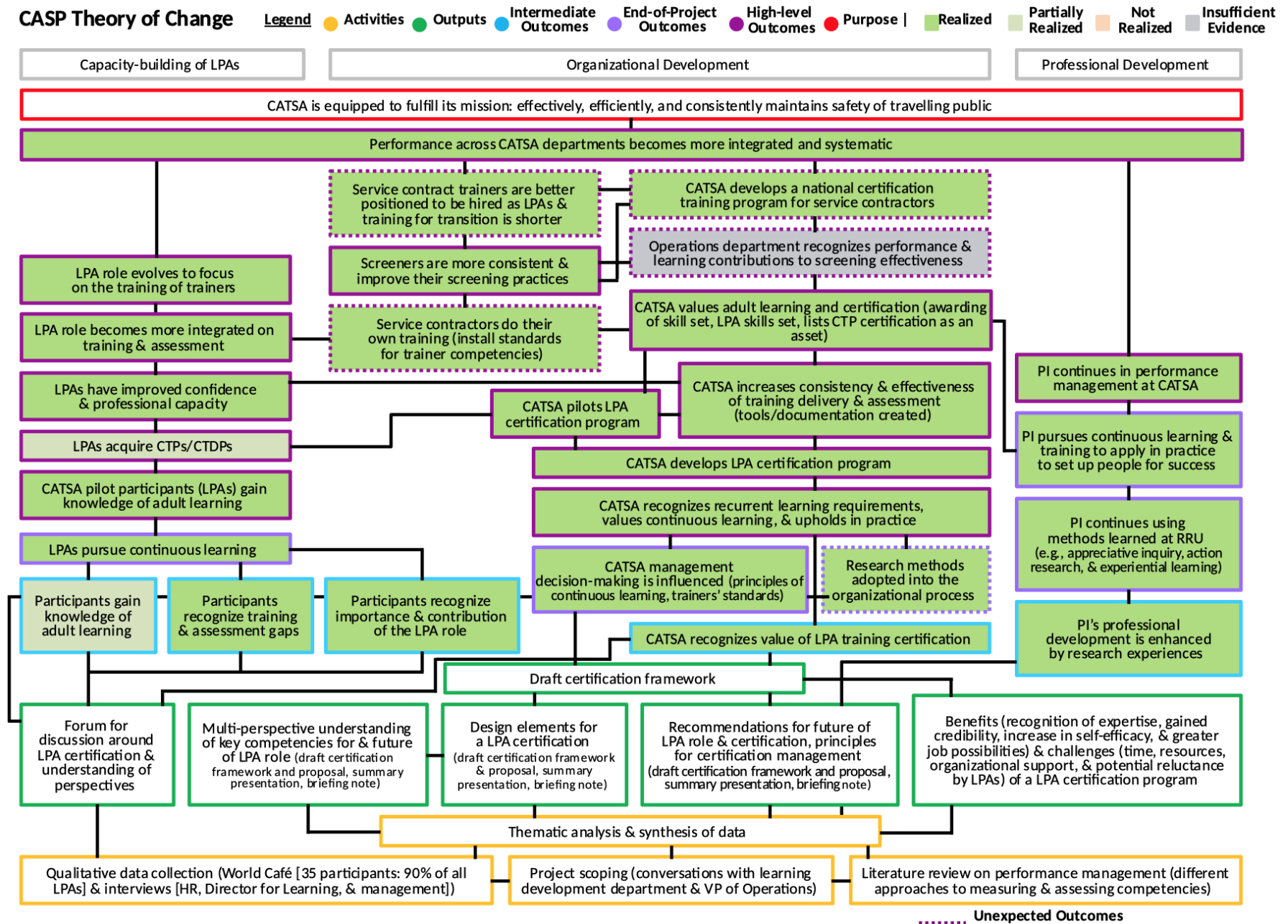


Figure 3. CASP Theory of Change, with outcomes colour-coded to reflect extent of outcome realization

## Mechanisms Leveraged by the Project

The CASP leveraged mechanisms of change that spanned across multiple impact pathways (Table 4). Some of the same mechanisms supported outcome realization in different pathways, demonstrating the multiple ways in which a single mechanism can be leveraged with different actors, contexts, and scales to support various change processes.

**Table 4.** Mechanisms of outcome realization by pathway leveraged by the CASP using Belcher et al.'s (2019) classification

Mechanism	Pathway		
	Organizational development	Capacity-building of LPAs	Professional Development
Scientific knowledge increased/knowledge gap filled	✓	✓	✓
Methods developed and/or refined			
Knowledge co-produced	✓	✓	
Research agenda influenced			
Alignment of research with parallel issues/initiatives	✓	✓	
Capacity of actors in system improved		✓	✓
Coalitions strengthened or created	✓		✓
Policy window opportunity realized			
Reputation leveraged or enhanced	✓		✓

Within the *organizational development* pathway, the CASP leveraged multiple mechanisms to increase organizational recognition of the value of LPA training certification by filling knowledge gaps, co-producing knowledge, aligning the research with CATSA's mission and directives, creating a discussion space to strengthen coalitions, and leveraging the PI's reputation to influence organizational change. The CASP filled a knowledge gap by investigating multiple perspectives of the role, its value, and the competencies needed to ensure LPAs are equipped for optimal performance and provided CATSA managers with the opportunity to reflect on this new knowledge (personal communication). The CASP increased the understanding of the benefits of certification for the organization to garner the organization's support to install a certification process. The action research approach also oriented the project for knowledge co-production. As the objective of the CASP was to establish a collaborative process to examine possible assessment methods for LPAs, the PI engaged relevant actors at different levels of the organization to explore priorities, opportunities, role-specific assessment criteria, and appropriate assessment methods. The CASP co-drafted a LPA certification framework using collective ideas and suggested action steps put forward by members of the organization. These co-production processes facilitated by the CASP helped to ensure ownership of the certification framework and the pilot process. The thesis indicates that this mechanism was intentionally leveraged to influence changes within this pathway, as "the level of participation [in the research process] impacts on both the quality of learning achieved by individuals and the degree to which that learning translates to the organization" (Doc1), enabling participants to take action to solve the research problem. The CASP aligned with parallel objectives and initiatives within CATSA that focused on airport screening consistency and safety to ensure that LPAs are held to high and consistent standards. Together, these alignments with organizational objectives and issues paired with the CASP's identification of the LPA certification gap made clear and relevant entry points for the project and CATSA was receptive to and developed an interest in the research as a result. The research activities, particularly the World Café session, brought together CATSA staff from different positions, regions, and backgrounds to engage in collective discussion and brainstorming that would inform the development of the draft LPA certification framework. Through this process, the CASP facilitated and fostered cross-organizational engagement between staff (who may not otherwise interact or collaborate) to strengthen professional relationships as well as build momentum, internal support, and advocates (i.e., a coalition) for implementation of LPA certification and other adult learning initiatives and professional development within CATSA. The PI's reputation was also leveraged to transfer knowledge gained through the CASP to CATSA colleagues and ultimately pilot the draft certification framework. The PI's

experience in the organization and established professional networks positioned them well to influence organizational change.

Mechanisms such as filling knowledge gaps, co-producing knowledge, issue alignment, and capacity-building were leveraged to influence change within the *capacity-building of LPAs* pathway. LPAs' knowledge gaps were also filled as the CASP supported LPAs to gain new knowledge that could be applied to their role as instructors, highlighted the difference between a teacher and a trainer, and increased understanding of certification. Filling LPAs' knowledge gaps helped garner support for an assessment and certification process. LPAs were involved in the CASP's knowledge co-production process, being consulted on areas of development and practical and appropriate assessment options. LPAs were constantly communicated with throughout the process and their feedback was fed into the pilot certification program (Res2). Again, the PI intentionally built knowledge co-production into the project based on principles from participation theory to ensure LPAs had ownership over and personal investment in the process (Doc1). The CASP sought LPAs' own knowledge and experiences to inform the creation of assessment methods for a certification program. The CASP aligned with parallel issues facing LPAs as security threats evolve and technology advances. The PI recognized that LPAs need to maintain a high-level of expertise, stay current with changing policies and procedures, and hold more and growing responsibilities, and so the CASP sought to fill this niche. A key mechanism characterizing this pathway was enhancing LPA capacity. LPAs' involvement throughout the research process aimed to cultivate interest in their professional development and continuous learning (Doc1). This has resulted in LPAs having more confidence in their expertise level (Doc1, Prac7, Prac9, Res2). The CASP provided a professional development opportunity for LPAs to reflect on their role, co-produce knowledge, and develop their capabilities and capacities through the pilot certification process. The CASP improved the capacity of LPAs by increasing their self-efficacy, building confidence and self-esteem, and supporting LPAs to be recognized as professionals (Doc1, Prac7, Prac9, Res2). LPAs have applied knowledge learned through the CASP and shared it with colleagues to support wider capacity-building (Prac4). Informants relayed how LPAs' improved confidence and professionalism have led to increased cross-organizational collaboration and involvement in continuous learning initiatives (Prac9).

In the *professional development* pathway, the PI leveraged multiple mechanisms to influence their personal and professional growth by filling knowledge gaps, building capacity, strengthening relationships and coalitions, and enhancing the PI's reputation. The CASP filled a knowledge gap by providing the PI with insight into different perspectives on the topic and how important it was to ensure solidified roles and expectations for expertise moving forward (personal communication). The PI learned methods of action research, which provided the PI with the opportunity to grow their own leadership capacity (Doc1). For example, the PI learned about question formulation, appreciative inquiry, and the importance of developing and constructing conversations. The CASP experience was professionally and personally valuable to the PI, and the PI has applied much of their knowledge and skills following the research. For example, the PI continues to use lessons learned at RRU in their current work at CATSA. Enhancing their leadership capacity through the project also enabled the PI to strengthen relationships and coalitions with like-minded colleagues and others with shared goals to support processes critical for the success of the CASP (Res1) and build momentum for the realization of outcomes post-project. The PI's insider status as a Learning and Performance Regional Manager and previous experience as a LPA provided them with first-hand experience of the challenges of the position, enabling them to build trust and a deep level of understanding with interview and World Café participants. The PI utilized the Master's research project as an opportunity to enhance their reputation as a certification and adult learning expert within CATSA to effect onward change.

### **Alternative Explanations of Outcome Realization**

With considerable time elapsed since the CASP it is difficult to separate outcomes resulting from the CASP and those resulting from the PI's ongoing work on the topic with CATSA. For example, the PI is noted to have contributed to a number of changes within the organization by working alongside peers across Canada, including those in the Learning and Development Department, to improve consistency and effectiveness across airport screening operations (Prac16). This department is focused on creating change in learning programs to stay current

with technology and evolving threats (Prac8). The Learning and Development Department at HQ interact with the different CATSA regions when developing training to understand resources and capabilities of the trainers (including LPAs) (Prac5). LPAs also review materials and provide feedback to ensure resources are fit for training purposes (Prac5). Other individuals within the department have also focused their efforts on developing standardized courses across all CATSA regions to ensure LPAs operate at a similar competency level (Prac8). Moreover, the Learning and Development Department also completed their own research on human factors within security to support and address these within training programs delivered by LPAs to amend and prepare curricula (Prac6). This alternative explanation contributes to the high-level outcome *CATSA increases consistency and effectiveness of training delivery and assessment*.

Other alternative explanations affecting the realization of outcomes include public pressures, often through a national and international government political channel, to improve screening operations within CATSA. For example, international events and threats to security require CATSA to respond, adapt, and mitigate these factors and formulate an approach to deal with the evolving political landscape (Prac3). Any major international terrorist event or threat brings with it modifications to CATSA training and assessment (Prac8). Economic factors have also played a role. The re-organization of CATSA as a result of the deficit reduction was a major factor in the new layout of training (Prac8). For example, training operations merged (e.g., *service contractors do their own training*) because of government cuts and budget cuts (Prac8). Government cuts resulted in the number and level of interactions and engagements within training to be reduced which posed challenges for management to assess the progress of LPAs and to allow LPAs to assess themselves against others (Prac13). However, the government cuts highlighted the increased importance to have a standard for LPAs (personal communication). The recent privatization of CATSA has also resulted in changes to training and assessment overseen by Transport Canada to ensure that continuous learning and certification remains at a high level and quality is not lost with organizational change (Prac8).

Informants discussed how there are a number of existing activities across CATSA that support knowledge-sharing and continuous learning, including annual regional retreats for specific training opportunities (e.g., managing workplace relationships, emotional intelligence, understanding personality types, etc.) (Prac4, Prac16). These retreats provide LPAs in certain CATSA regions to exchange experiences, insights, and expand their skillsets, contributing to the EoP outcome *LPAs pursue continuous learning* (Prac4). There are also national meetings with all LPAs to review current issues and provide feedback on training and certification (Prac1). Prior to the CASP, informants discussed how learning and development was an integral part of CATSA. For example, CATSA has always supported and promoted adult learning and continuous education (Prac4). However, informants discussed how assessment is now more sophisticated because of findings and insights that arose from the CASP (Prac4). CATSA continues to provide a variety of workshops, programs, and courses to assist staff (including LPAs) in their personal and professional growth (Prac16). Over the last ten years, screening officers are noted to have had recurrent learning practices to improve consistency and screening practices, which have evolved based on the operational and technological systems used within the role and dependent on the resource base (Prac5).

### **Summary**

These examples demonstrate that there were few initiatives running in parallel to the CASP that were contributing to similar outcomes. However, prior work by the Learning and Development Department to modify training materials, political and public pressures to ensure screening is consistent and effective, and economic factors influenced organizational changes within CATSA. Informants discussed how CATSA is a learning organization and has supported continuous learning and assessment to support LPA certification both prior to and following the CASP. Yet, as an influential figure within the organization, it was difficult to separate and distinguish between contributions to outcomes made by the CASP and the PI's other work within CATSA.

### **Were there any positive or negative unexpected outcomes from this project?**

As previously noted, a number of unexpected outcomes emerged during and after the CASP. These were documented within the project ToC and discerned in collaboration with the PI given the time that has elapsed

since the end of the CASP. The unexpected outcomes included in the ToC are: *research methods adopted into organizational practice* (intermediate outcome); *service contractors do their own training (install standards for trainer competencies)* (high-level outcome); *operations department recognizes performance and learning contributions to screening effectiveness* (high-level outcome); *CATSA develops a national certification training program for service contractors* (high-level outcome); and *service contract trainers are better positioned to be hired as LPAs and training for transition is shorter* (high-level outcome).

Regarding the unexpected high-level outcome *service contractors do their own training*, one informant discussed how the application of a standardized program for service contractors resulted in the loss of some SCTR staff. This occurred because the standardized program identified whether individuals were the right fit for the job and able to meet standards (Prac8). Although dismissed SCTRs may view this as a negative outcome, other informants discussed this as a positive outcome relating to overall safety and operational excellence (Prac8). One informant linked this unexpected outcome to the CASP, as the project aimed to ensure trainers were operating to the best of their ability and had the necessary skills and competencies to be successful within the airport security context (Prac8). Unexpectedly, the CASP has been used as an exemplar project in the MAL program at RRU (Res1). MAL professors showcase the CASP for its use of creative methods, analytical synthesis (e.g., integration of literature, triangulation between scoping interviews, World Cafés, follow-up interviews, etc.), and dissemination approaches to share and translate findings for uptake by CATSA (personal communication). This exposure has supported other students to learn from and pursue meaningful research projects that support organizational change in other contexts. by presenting creative methods for data collection (e.g., triangulation between scoping interviews, World Cafés, and follow up interviews) and dissemination (personal communication).

One informant discussed how some CATSA staff may have found the CASP results initially difficult to come to terms with due to the notion of people not wanting to hear about gaps or faults within their own work (Prac14). However, as previously discussed, the CASP had support from managers and many LPAs were very supportive of the research and the need for a standardized assessment and certification process (Doc1, Res2).

When asked about potential negative outcomes of the CASP, respondents believed that no negative outcomes manifested as a result of the PI's research (Prac4, Prac6, Prac10, Prac13, Prac14, Prac15, Prac16, Res1).

### **Could the outcomes have been realized in the absence of the project?**

Several other actors and processes, in addition to the CASP, have influenced organizational change and LPA capacity development at CATSA. Evaluation informants were asked whether the outcomes could realistically have been realized had the CASP not been conducted. Informants discussed how the status quo would have likely remained (Prac10). Some informants suggested that the specific topic had not been previously explored by CATSA before, so the likelihood that the organization would have discussed it in detail without the influence of the CASP is low (Prac6). Moreover, the quality of work completed across all airport screening in Canada would not be as high as it is today (Prac14). It is also unlikely that some changes in security scanner training would have occurred in the absence of the CASP, and the quality of training may have been lower without the PI's continued focus on the topic because of greater inconsistency in training and assessment delivered by LPAs (Prac4, Prac15). One informant suggested that non-qualified and/or under-qualified individuals may have otherwise conducted training within the organization (Prac8). Although an assessment and certification strategy may have eventually been put in place by CATSA, the CASP instilled a sense of urgency and awareness of the need to have standardized assessment practice in place for LPAs (Prac10). As organizational change takes time to manifest, informants believed that the CASP successfully sped up the process (Prac9, Prac10). Without the research, the organization may be seven or eight years behind their current progress (Prac9). In the absence of the project, LPAs would not have achieved the level of credibility they now hold, and they would not have been as effective in improving screening outcomes, both nationally and locally (Prac9). Informants suggested that without the CASP, LPAs may have been "*dismissed*" (personal communication) with the potential belief that the LPA role could be completed by anyone; the CASP drove LPAs as professionals. While the unexpected deficit reduction and budget cuts halted the pilot certification program from becoming a mandatory program, the CASP

successfully supported CATSA to recognize recurrent learning requirements, value continuous learning, and uphold this in practice by creating tools (e.g., onboarding checklist) and being supportive of continuous learning activities (Prac13). The project also supported a greater “*spirit of collaboration*” (Prac9) between service contractors and CATSA. The PI is noted to be “*one of the keys to success*” (Prac9) for service contractor organizations, even though the PI is not directly employed by them. Yet, as previously discussed, it was difficult for some informants to discern between outcomes resulting from the CASP and outcomes resulting from the PI (i.e., the PI may have focused on the topic within their role even if the CASP had not been completed) (Prac13). The PI’s personal capacities and competencies, including their personality and energy, are discussed as clear implementing factors for the success of the project (Res1). Without the PI leading the CASP, it is unlikely that the project would have been as successful in instilling sustainable organizational change (Res1).

### **Were the assumptions pertaining to why changes were expected sustained?**

Project assumptions underpin why the CASP would contribute to social change in the problem context. All eight assumptions were sustained (Table 5). The CASP used a participatory approach to support the co-production and ownership of knowledge and leveraged the PI’s professional networks within CATSA to foster support for the research and disseminate knowledge to key decision-makers within CATSA. These characteristics helped the project to realize outcomes. Principles from stakeholder theory (Freeman, 1984), situated learning theory (Lave & Wenger, 1991), and social capital theory (Putnam, 2000) help explain why expected changes occurred in the case of the CASP.

Stakeholder theory can explain how the CASP ensured that project outputs were taken up and supported by CATSA through targeted engagement with relevant stakeholders (i.e., managers who could support the implementation of an LPA assessment and certification strategy) (Doc1). Stakeholder theory seeks to develop relationships with key stakeholders to improve efficiencies throughout a project or organization (Freeman, 1984). The PI strategically chose the Director of Operations at CATSA as the project sponsor because the CASP indirectly affected their division, the Director expressed willingness to support the project and had authority to approve the project on behalf of CATSA, and the establishment of a LPA certification program aligned with the Director’s objectives (Doc1). The PI also collaborated with other CATSA staff in leadership and managerial positions throughout the project to seek feedback and share findings to build stakeholder support. For example, the Learning and Development Department, as well as other internal departments, were invited to participate in the interviews and World Café session to provide human resource, development, and operational expertise, as well as diverse vantage points (Doc1). By collaborating with managers and including their feedback throughout the process, the CASP ensured trust in the project outputs and enhanced the rate of knowledge-to-action (Freeman, 1984). Including LPAs in the development of the draft LPA certification program to solve the assessment gap led to a sense of ownership over and personal investments in the resulting recommendations and pilot (Doc1). Overall, stakeholder theory explains the anticipated modified behaviour of key stakeholders at CATSA in pursuing continuous learning and providing increased opportunities for development.

Situated learning theory describes how learning is embedded within an activity, context, and culture, and is usually unintentional rather than deliberate (Lave & Wenger, 1991). Situated learning theory explains the learning of CASP participants throughout the research process where knowledge was co-constructed. In the case of the CASP, key learning emerged from discussions to elicit multi-perspective understanding of key competencies for the LPA role and aspirations for the role in the future. The socially interactive and collaborative research activities built in the essential components of situated learning theory, enabling LPAs to organically engage with new ideas and diverse perspectives, subconsciously adopt new beliefs and behaviours (e.g., importance of adult learning, embodying LPA competencies), and co-develop solutions and recommendations (Woolf, 2009). The CASP produced knowledge within the context it aimed to influence in order to provide LPAs with the opportunity to learn and take ownership of the knowledge. For example, the PI selected the World Café method in order to engage a large group of stakeholders in the discussion process, and cultivate interest and commitment from participants to support the LPA certification program in the future (Doc1).



**Table 5.** Project assumptions assessment

Assumption	Result
<p>The CASP exposes informants to interdisciplinary perspectives on the topic</p> <p>[Organizational development pathway]</p> <p>[Capacity-building of LPAs pathway]</p>	<p><b>Sustained.</b> The aim of the CASP was to examine the role of the LPA and identify strategies for assessment and certification in consultation with LPAs and other stakeholders (Doc1); this aim had an interdisciplinary foundation. Project documentation conveys interdisciplinary understanding from multiple disciplines (e.g., adult learning theory, competency assessment, organizational learning, etc.). The interdisciplinary perspective taken by the CASP ensured the successful integration of academic learning theories into the practical application of LPA assessment and certification. The CASP acknowledged the challenges in using academic theory within practice and discusses how theory “<i>may not become meaningfully internalized and usable as knowledge until an experience creates new meaning by bringing cognitive understanding together with the emotion of the experience</i>” (Doc1). The CASP successfully addressed this challenge by situating theory within a participatory learning experience for LPAs, exposing them to interdisciplinary perspectives on the topic. Informants highlighted how adult learning theory was useful from a practitioner perspective to understand the different methods in which people learn and the importance of modifying training methods according to theories of learning (Prac9, Prac16). Informants (including LPAs) have taken learning from these theories and applied it within their own work. The PI also continues to use interdisciplinary learning in their day-to-day work, including action research approaches (Doc1).</p>
<p>Partners are receptive to and develop an interest in the topic</p> <p>[Organizational development pathway]</p> <p>[Capacity-building of LPAs pathway]</p>	<p><b>Sustained.</b> The CASP aligned with CATSA’s organizational purpose and mandate, and assisted CATSA in maintaining a standard of operational excellence (Doc1). For example, CATSA’s NTCP objective is to encourage continuous improvement and maintenance of a high-level of skill through a multi-level program (Doc1). With screening officers being required to attain certification to demonstrate proficiency in all endorsement areas, the research aim to establish a similar process for LPAs fell within CATSA’s objective to ensure consistency and quality throughout Canada’s airports and “<i>demonstrate the philosophy of continuous learning and improvement</i>” (Doc1). With the constant evolution of terrorist threats, CATSA must also evolve and invest in the development of employees to ensure quality performance and increasing ability (Doc1). These threats, coupled with the expanding responsibility of the LPA role, contributed to the receptivity and interest of CASP partners to explore the topic. The PI was supported by their directors as sponsors to conduct the CASP, and utilized an advisory team comprised of other regional managers who also had a stake in the findings (Doc1). Although some LPAs were cautious of being assessed and certified, the majority of LPAs supported and were enthusiastic about the project (Res2). The CASP highlighted the value of an LPA training certification to CATSA to support the organization in recognizing recurrent learning requirements, valuing continuous learning, and upholding this in practice.</p>
<p>The PI’s insider perspective within the organization positions them well to influence change</p> <p>[Organizational development pathway]</p>	<p><b>Sustained.</b> The PI interacted sufficiently with the problem context to gain a breadth and depth of understanding and incorporate insights through their personal experience as a former LPA and Regional Manager of Learning and Development. The PI’s previous role as a LPA allowed them to be very familiar with the role, its responsibilities, and the challenges of the LPA position (Doc1). The PI’s insider perspective within CATSA provided them with the established networks necessary to encourage high levels of participation and response rates, disseminate findings, and position them well to influence future change.</p>
<p>The research demonstrates the value of participatory methods for subsequent uptake</p> <p>[Organizational development pathway]</p> <p>[Professional development pathway]</p>	<p><b>Sustained.</b> The method of action research ensured an inclusive approach to answering the research question and discovered creative solutions concerning change initiatives (Doc1). The collaborative approach taken by the CASP successfully brought stakeholders together to take action to solve the research problem and increased the likelihood of uptake (Doc1). The World Café method was chosen because it was inclusive and emphasized “<i>collectively creating intelligence rather than individually identifiable contributions</i>” (Doc1). The participatory process of the World Café engaged stakeholders in the creation of the LPA certification process and built commitment to the future of LPA assessment and certification (Doc1). Participatory methods strengthened a sense of ownership over the certification program which supported LPAs in changing their behaviour (Doc1). World Cafés were also taken up and used by CATSA and other service contractor organizations as a valuable method to engage target audiences in problem-solving and gather a wide range of perspectives using available resources (Prac9). The PI also continues to use action research within their everyday work to support change processes within</p>



	the organization (personal communication). With the CASP being used as an exemplar project for other MAL students, it can be expected that creative and participatory methods will be utilized by future students.
<p>The recommendations are useful, practical, and accessible for implementation, and were sufficiently rigorous to be taken seriously</p> <p>[Organizational development pathway]</p> <p>[Capacity-building of LPAs pathway]</p> <p>[Professional development pathway]</p>	<p><b>Sustained.</b> The CASP co-developed recommendations for CATSA, suggesting strategies for the design and implementation of a LPA certification program to increase program success and LPA effectiveness (Doc1). The recommendations were derived from rigorous integration and triangulation of academic literature, interview data, and the World Café discussion. Subsequently, a pilot certification program was tested following the CASP with CATSA taking the initial steps to “<i>embark on the strategy recommended by [CASP] participants in the findings and recommendations</i>” (Res1). CATSA was keen to implement the recommendations before government budget cuts were instituted, revealing the perceived usefulness and practicality of CASP recommendations. Despite the budget cuts, CATSA standardized existing assessment processes to resemble CASP recommendations (i.e., formal standards now exist for LPAs though these are not mandatory), revealing the continued applicability and use of the recommendations put forward by the PI.</p>
<p>There is a need for improved organizational policy and practice to ensure consistency and continuous learning are instilled in the organization</p> <p>[Organizational development pathway]</p> <p>[Capacity-building of LPAs pathway]</p>	<p><b>Sustained.</b> CATSA was created in part to ensure consistency in the screening of people and items through airport security. National consistency and procedural accuracy affect the quality of security offered in Canada’s airports, and it is important that CATSA can demonstrate that LPAs maintain a high level of expertise and stay current with changing policies and procedures (Doc1). The CASP identified the existence of pertinent practice gaps affecting consistency across all levels of CATSA operations. For example, the growth of the Learning and Development team prior to the CASP presented new challenges in maintaining consistency across certification processes and course delivery in each region (Doc1). The CASP also emphasized the roles of continuous learning and advancement in achieving consistency. To help CATSA achieve greater consistency, the CASP highlighted the need for improved organizational policy and practice to hold LPAs to similar standards (personal communication). The CASP supported CATSA’s role as an organization in fostering continuous learning and always trying to expand continuous improvement (Prac6).</p>
<p>Facilitating co-generation and mutual learning processes through the research generated benefits and reflection for all parties involved to improve practices</p> <p>[Organizational development pathway]</p> <p>[Capacity-building of LPAs pathway]</p> <p>[Professional development pathway]</p>	<p><b>Sustained.</b> The CASP built mutual learning and knowledge co-generation processes into the research design (e.g., World Café) (Doc1). CASP participants indicated that the World Café stimulated their reflection on key competencies of the LPA role and the future of LPA assessment and certification (Prac5, Res2). CATSA’s development of the onboarding checklist used to streamline the process of LPA training and ensure the right people were being hired for the position (i.e., had the necessary skills and competencies) was linked to the reflection facilitated during the project and from the findings (Prac8). The CASP provided a mutual learning and professional development opportunity for LPAs to improve their confidence and professional capacities (Prac4, Prac10). The CASP supported LPAs to operate at a higher standard through their learning about adult learning and via the LPA certification pilot (Prac5, Prac15). By facilitating co-generation and mutual learning processes, the CASP opened a door for LPAs to achieve a level of subject matter expertise, consistency, and be viewed as credible professionals within the organization (personal communication).</p>
<p>A Master’s degree holds universal recognition and provides the opportunity to expand on research capacities and expertise</p> <p>[Professional development pathway]</p>	<p><b>Sustained.</b> The CASP provided the PI with increased knowledge, skills, and expertise for their ongoing work as Regional Manager of Learning and Development on the topic of LPA assessment and certification. Having a Master’s degree provided the PI with the opportunity to learn more about adult learning theory and processes of organizational change, which increased colleagues’ perceptions of the PI as an expert and leader on the topic within CATSA (Res1, Res2).</p>

The PI's experience as Regional Manager of Learning and Development were necessary for the success of the CASP research process, as explained by social capital theory (Putnam, 2000). Social capital theory suggests that social relationships are resources that can lead to the development and accumulation of human capital (e.g., education, training, health, etc.). The existing social relationships between the PI as a manager, LPAs as staff, and other colleagues in decision-making positions eased access to participants (i.e., drawing on established trust) and opened opportunities for individuals and CATSA as an organization to share what was important for them, influence the research design, and benefit from their participation. The CASP also influenced the social capital of other actors in the social system (e.g., LPAs) by creating a forum for discussion and coalition-building and providing opportunities for capacity-building through continuous learning.

### **Are the higher-level changes likely to be realized?**

All higher-level changes identified in the CASP ToC have the potential to be realized. At the time of the evaluation, there was evidence indicating that sixteen out of seventeen high-level outcomes have begun to or have already been realized (Table 6; see Appendix 6 for more detailed results). For the remaining high-level outcome, realization of respective antecedent outcomes (i.e., intermediate and EoP outcomes) show promise for future changes to manifest. However, some high-level outcomes were affected by the budget cuts following the CASP, which were out of the control of the project. As the organization underwent privatization at the time of the evaluation, some informants hypothesized that CATSA will begin to focus more on formal assessment and certification practices (Prac8, Res2).

The CASP contributed to key antecedent outcomes that support high-level outcomes in the *organizational development* pathway, such as increasing organizational consistency and effectiveness of training delivery and assessment. Evidence suggests external factors have also played a role in the realization of high-level outcomes within this pathway. This includes the nature of CATSA as a learning organization and the context of airport security which embodies constantly evolving new threats and technology. However, there is insufficient evidence to assess outcomes relating to the operations department's recognition of performance and learning contributions to screening effectiveness. High-level outcomes in the *capacity-building of LPAs* pathway have been or have the potential to be realized owing to the PI's and CATSA's continual efforts in driving continuous learning and development. Within the *professional development* pathway, the CASP prepared and equipped the PI to advance performance management at CATSA, working closely with LPAs and service contractors to share principles of continuous learning.

**Table 6.** Higher-level outcome assessments

Results	Illustrative Evidence	
Outcome Assessment	Summary of supporting evidence for assessment	Contextual factors and causal mechanisms affecting outcome realization
<b>Organizational Development Pathway</b>		
CATSA recognizes recurrent learning requirements, values continuous learning, and upholds in practice  <b>Realized, clear project contribution</b>	<ul style="list-style-type: none"> <li>LPAs are encouraged by CATSA to build professional development opportunities into their yearly performance plans (interviews, documents)</li> <li>Informants acknowledged that the LPA role requires continuous updating and reinforcement, with LPA certification viewed as an opportunity to ensure LPAs stay current (interviews, documents)</li> </ul>	Facilitating factors: <ul style="list-style-type: none"> <li>CATSA was open to the CASP because of their interest in organizational improvement</li> <li>The CASP demonstrated the need for and stakeholder willingness to support LPA learning, professional development, and certification</li> <li>The main selling feature of the CASP pilot certification program was the recognition and validity the certification process would bring to LPAs</li> </ul> Alternative explanation: <ul style="list-style-type: none"> <li>Recurrent learning requirements were a central part of CATSA and airport security roles prior to the CASP</li> </ul>
CATSA develops LPA certification program  <b>Realized, clear project contribution</b>	<ul style="list-style-type: none"> <li>A pilot LPA certification program was developed by CATSA in partnership with the PI and senior leaders at the organization (interviews, documents) <ul style="list-style-type: none"> <li>The PI was the leading implementer in developing the LPA program and rolling out the pilot (interviews)</li> </ul> </li> <li>The Prairies region of CATSA was the first to encourage LPAs to complete the certification program and achieve their CTP/CTDP designation (interviews)</li> <li>CATSA supports LPAs who completed the certification program to maintain their CTP/CTDP certification and are re-enrolled into the CTP membership by CATSA (interviews)</li> <li>Training of LPAs has also become more sophisticated in terms of the level of detail and quality (interviews)</li> </ul>	Facilitating factors: <ul style="list-style-type: none"> <li>By involving senior management, Learning and Development managers, and the Learning and Development Department in discussions around the draft certification framework, CASP participants had the opportunity to provide feedback and contribute to the certification framework</li> <li>CATSA managers are supportive of LPAs completing additional training to further their careers and professional development</li> </ul> Barriers: <ul style="list-style-type: none"> <li>The LPA certification program pilot was halted because of organizational cuts and restructuring <ul style="list-style-type: none"> <li>However, the on-boarding program and oversight training have many similarities to the original LPA certification program proposed by the CASP</li> </ul> </li> </ul>
CATSA pilots LPA certification program  <b>Realized, clear project contribution</b>	<ul style="list-style-type: none"> <li>The Prairies region of CATSA piloted the initial LPA certification program developed by the CASP in partnership with CATSA and assessed by the Canadian Society for Training and Development (CSTD) now the Institute for Performance and Learning (I4PL) (interviews)</li> <li>CATSA supported the pilot and invested in the certification process (e.g., paying for LPAs examination fees) (interviews)</li> <li>The findings from the pilot were shared with the wider organization and LPAs who completed the pilot were involved in constant communication to gather feedback on the process (interviews)</li> </ul>	Barriers: <ul style="list-style-type: none"> <li>Before the pilot could be implemented in other regions of CATSA, the deficit reduction restricted the Learning and Development Department's resources available for formal training and certification</li> </ul>

<p>CATSA increases consistency and effectiveness of training delivery and assessment (tools/documentation created)</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• CATSA created and implemented a number of tools and guides to increase the consistency and effectiveness of training and delivery assessment (interviews, documents) <ul style="list-style-type: none"> <li>• Onboarding checklist was developed to standardize the process (interviews, documents)</li> <li>• Facilitation guides were created to improve the consistency and effectiveness of course and training delivery (documents)</li> <li>• A LPA competency guide was developed, containing essential area themes and skillsets LPAs are assessed against (interviews, documents)</li> </ul> </li> <li>• Improvements to onboarding training across the organization have increased success rates and effectiveness (interviews)</li> <li>• Although the formal LPA certification program is no longer mandatory, the onboarding checklist acts as an informal certification process to ensure key skills are maintained (interviews, documents)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• The CASP supported CATSA in developing process and protocol documentation to increase consistency and effectiveness via findings on assessment gaps, the pilot, and sharing pilot results</li> <li>• The PI was involved in the development of CATSA training and assessment resources (e.g., onboarding checklist)</li> </ul> <p>Barriers:</p> <ul style="list-style-type: none"> <li>• Some informants discussed how consistency remains a challenge across LPAs, particularly the implementation of hands-on training</li> </ul> <p>Alternative explanation:</p> <ul style="list-style-type: none"> <li>• CATSA continually makes improvements and changes to increase consistency and effectiveness of screening because of the evolving security context (e.g., threats, technology)</li> </ul>
<p>CATSA values adult learning and certification (awarding of skillset, LPA skillset, lists CTP certification as an asset)</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• CATSA understood that learning principles were important to the LPA role, and a training/development was necessary to the role (personal communication)</li> <li>• CATSA encourages adult learning and sees value in the CTDTP designation (interviews) <ul style="list-style-type: none"> <li>• There is now greater emphasis on the importance of adult learning among new hires (interviews)</li> <li>• CATSA still holds these values, despite the decision to make LPA certification optional (interviews)</li> </ul> </li> <li>• Informants were unaware of any changes in hiring practices to focus on CTP/CTDPs (interviews)</li> <li>• Prior to institutional change, CATSA did originally list CTP/CTDP as an asset (personal communication)</li> <li>• With the organizational move to become a private organization, informants believe that there will eventually be a greater focus on consistency, adult learning, and certification (interviews)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• The evolution of CATSA from a police culture to a public service culture supported the organizational shift to focus on adult learning and certification</li> <li>• The CASP identified the value of continuous adult learning</li> <li>• The PI's position, authority, and influence within the organization supported CATSA to value adult learning</li> </ul> <p>Barriers:</p> <ul style="list-style-type: none"> <li>• CATSA's transition into privatization has uncovered other priorities which compete with the development of an adult learning and certification program</li> </ul>
<p>Service contractors do their own training (install standards of trainer competencies) (unexpected outcome)</p> <p><b>Realized, unclear project contribution</b></p>	<ul style="list-style-type: none"> <li>• Service contractor trainers now have increased responsibility (interviews) <ul style="list-style-type: none"> <li>• Select LPA responsibilities (e.g., lower risk training) have now been delegated to SCTR because of increased training volume needed to accommodate changes in technology and updated processes which has been an iterative process over time (interviews)</li> </ul> </li> <li>• Service contractors have begun to create their own training materials (e.g., quarterly improvement plans, analyses,</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• Rising professional expectations for LPAs (because of the CASP) crossed over to SCTR</li> <li>• With the LPA certification program template, service contractors emulated the LPA certification process and began to do their own training and install standards for trainer competencies</li> </ul>

	<p>assessments) on top of resources provided to them by CATSA to improve problem areas and deliver training at a higher standard (interviews)</p> <ul style="list-style-type: none"> <li>• Service contractors and CATSA have a collaborative relationship to develop new processes and approaches to lead to positive outcomes in screening (personal communications)</li> <li>• Through the CASP, CATSA has set the standard for LPAs raising the importance of consistency and competency across all screening operations (personal communication)</li> <li>• Inspired by the CASP, SCTR's underwent a similar certification process as LPAs to ensure there are common approaches and improved training results (interviews)</li> </ul>	
<p>Screeners are more consistent and improve their screening practices</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• Informants were aware of CASP findings relevant for effective security screening</li> <li>• The PI identified gaps for frontline screeners and made recommendations to improve screening efficiency and effectiveness (interviews)</li> <li>• The increased consistency and effectiveness of LPAs is having a spillover effect on service contractor trainers and screening officers, who benefit from the more consistent and effective training (interviews)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• The PI instilled momentum and has influenced overall screening effectiveness through the CASP and their ongoing work</li> <li>• The PI has good working relationships with service contractors</li> <li>• Rising professional expectations for LPAs and consistent practice have likewise affected expectations for SCTR's to be held to similar standards</li> <li>• Due to the PI's work, CATSA and operating partners can deliver best-in-class service in the world with security groups from the USA, Europe, and Israel visiting CATSA to learn from the organization and its operations</li> </ul>
<p>Service contract trainers are better positioned to be hired as LPAs and training for transition is shorter (unexpected outcome)</p> <p><b>Realized, unclear project contribution</b></p>	<ul style="list-style-type: none"> <li>• As expertise increased at all levels, SCTR's became eligible for new opportunities and were better positioned to be hired as LPAs</li> <li>• Several former screening officers and SCTR's have moved into the LPA role as a result of their exposure to an adult learning background (interviews)</li> <li>• SCTR's are now assessed on similar functions as LPAs, and undergo a similar training process; therefore, it can be expected that SCTR's are better positioned to be hired as LPAs and training for transition is shorter (interviews)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• SCTR's work closely alongside LPAs to deliver both hands-on training and evaluation/assessment which has shortened training for transition to the LPA position</li> <li>• Overlap in the SCTR and LPA roles has supported the recognition of exceptional SCTR's</li> </ul>
<p>Operations Department recognizes performance and learning contributions to screening effectiveness (unexpected outcome)</p> <p><b>Insufficient evidence</b></p>	<ul style="list-style-type: none"> <li>• Informants believed the Operations Department better understands how learning and performance support screening effectiveness (interviews)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• CASP findings (e.g., identifying the value of continuous adult learning) were shared with Operations Department staff to build awareness and increase recognition</li> <li>• Prior to 2012, the Operations Department were separate from the Learning and Development team which has since shifted. The Operations Department and Learning and Development team now work more cohesively as one team and report to the same department</li> </ul>

<p>CATSA develops a national certification training program for service contractors (unexpected outcome)</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• CATSA developed and implemented a formal certification program for SCTRs to attain and maintain continuous learning (interviews, documents)</li> <li>• This program was influenced by the CASP and LPA certification pilot; it was a natural next-step for SCTRs to also be certified to ensure consistency and effectiveness at all levels of CATSA operations (interviews) <ul style="list-style-type: none"> <li>◦ This resulted in CATSA further defining between different roles, positions, and agencies, and requiring a demonstration of skills to fulfil the role (personal communication)</li> </ul> </li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• The CASP identified the value of continuous adult learning and supported the organization in recognizing performance and learning contributions to screening effectiveness</li> </ul>
<p>Performance across CATSA departments becomes more integrated and systematic</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• Increased sharing of resources for training and consistency across departments is supporting increased collaboration and the integrated performance across CATSA departments (personal communication)</li> <li>• There has been increased cooperation and collaboration between different colleagues and departments across CATSA (interviews)</li> <li>• Since the CASP, department discussions at CATSA now always include the topic of training, with an increased recognition that training supports increased consistency. Prior to the CASP, the topic of consistency was not discussed within CATSA (personal communication)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• Organizational emphasis on training led to performance becoming more integrated and systematic across CATSA departments</li> <li>• The PI's enhanced leadership and strategies learned from completing the CASP has also influenced the leadership of different groups within CATSA</li> </ul> <p>Barriers:</p> <ul style="list-style-type: none"> <li>• Sustainable organizational change requires time, dedication, and effort by all stakeholders</li> <li>• It is challenging to discern the potential effects of the CASP and the effects of the PI's continued work in the topic who drives these principles within their day-to-day work</li> </ul>
<p><b>Capacity-building of LPAs Pathway</b></p>		
<p>CATSA pilot participants (LPAs) gain knowledge of adult learning</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• LPAs learned about adult learning theory and techniques through the pilot and the CASP, which they would not have learned otherwise on-the-job (interviews)</li> <li>• LPAs are now viewed as a professional group who are more involved in and successful at collaboration with service contractors (interviews)</li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• The pilot certification process gave LPAs the opportunity to immerse themselves in relevant literature on learning theories which some LPAs continue to use in their daily role</li> </ul>
<p>LPAs acquire CTPs/CTDPs</p> <p><b>Partially realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>• Six LPAs completed the pilot certification process and acquired their CTP/CTDP (interviews, documents)</li> <li>• LPAs who gained their designation discussed their excitement for the process and their maintained level of consistency and professionalism that resulted (interviews) <ul style="list-style-type: none"> <li>• Informants accredited this to the PI for the initial introduction of the LPA assessment process and encouraging LPAs to acquire CTP/CTDP (interviews)</li> </ul> </li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>• The CASP process and findings convinced LPAs of the importance of adult learning, and were encouraged to pursue CTP/CTDP designation</li> <li>• CATSA supported the LPA certification pilot</li> <li>• CATSA paid for LPAs' examination fees and courses renewing designation</li> <li>• The pilot's success stimulated LPAs to pursue other professional development opportunities</li> </ul> <p>Barriers:</p>

	<ul style="list-style-type: none"> <li>Although the formal certification program was not sustained because of funding cuts, most LPAs supported the idea of assessment and were personally interested in acquiring CTP/CTDP (interviews)</li> </ul>	<ul style="list-style-type: none"> <li>Not all LPAs acquired CTP/CTDP designation as it is not a mandatory requirement within CATSA</li> <li>Implementing the initial assessment process was not without challenges as some LPAs were not fully committed to the initiative</li> <li>The certification pilot was halted because of the government deficit reduction action plan (DRAP) and organizational restructuring</li> </ul>
<p>LPAs have improved confidence and professional capacity</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>Informants confirmed that overall LPA performance has improved (interviews) <ul style="list-style-type: none"> <li>Informants believed LPAs who participated in CASP and the pilot certification program have grown and advanced as trainers, facilitators, and advisors, giving LPAs a sense of professional accomplishment and consistency across the group (interviews)</li> </ul> </li> <li>The pilot certification program supported LPAs to enhance their self-efficacy and confidence to communicate professionally (documents) <ul style="list-style-type: none"> <li>Designations acquired through the pilot enabled LPAs to self-promote their future careers both inside and outside CATSA, and maintain self-motivation to pursue further adult learning (interviews)</li> <li>The CASP and pilot certification enhanced the LPA skillset to enable the group to become a significant partner and collaborator that supports the efficiency of operations and the development of screening officers (interviews)</li> </ul> </li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>Being certified by an external certification body supported LPAs in being recognized as valid and professional trainers and enhanced their credibility</li> <li>The process and protocol documentation developed by CATSA resulted in improved confidence and professional capacity of LPAs because of their improved effectiveness</li> </ul>
<p>LPA role becomes more integrated on training and assessment</p> <p><b>Realized, clear project contribution</b></p>	<ul style="list-style-type: none"> <li>The quality of training and assessment performed by LPAs has improved (interviews) <ul style="list-style-type: none"> <li>Informants linked these changes to the CASP and the pilot certification program. For example, LPAs who completed the certification program discuss their challenges and identified gaps and use language from the certification program to share insights with those who did not take the certification expressing an interest in learning more (interviews)</li> <li>LPAs who completed the certification program have a professional advantage (personal communication)</li> </ul> </li> </ul>	<p>Facilitating factors:</p> <ul style="list-style-type: none"> <li>As part of the reorganization of CATSA, the role became more integrated on training and assessment</li> </ul> <p>Alternative explanations:</p> <ul style="list-style-type: none"> <li>The LPA role is constantly evolving to accommodate new information, technology, and security threats; therefore, LPAs need to be able to quickly adapt to the dynamic nature of airport screening and changing regulations/requirements</li> <li>There has been increased responsibility within the LPA role as airports expand, more screening officers are hired, and screening officers' functions expand</li> </ul>
<p>LPA role evolves to focus on the training of trainers</p> <p><b>Realized, unclear project contribution</b></p>	<ul style="list-style-type: none"> <li>LPAs work in partnership with SCTR to deliver training, with LPAs performing oversight and the SCTR taking a more hands-on approach to ensure consistency in the delivery of training (interviews)</li> </ul>	<p>Alternative explanations:</p> <ul style="list-style-type: none"> <li>The LPA role is constantly evolving to accommodate new information, technology, and security threats</li> </ul>

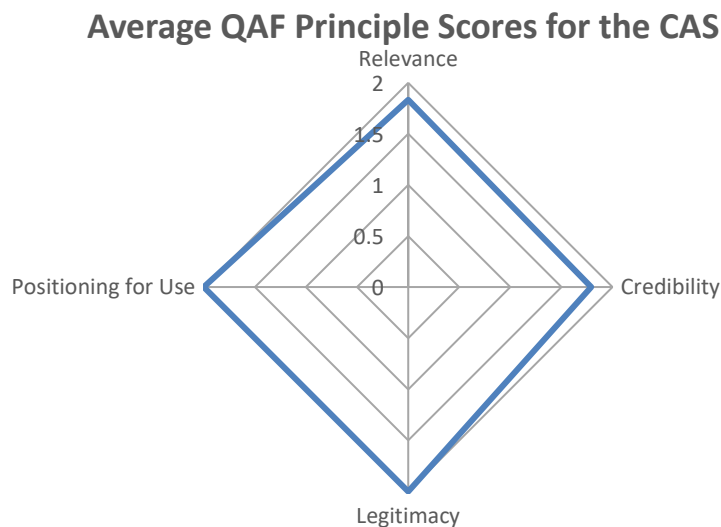
	<ul style="list-style-type: none"> <li>• The delegation of lower-risk training to third-party service contractors has enabled LPAs to focus on training of trainers (interviews)</li> <li>• The LPA role is now focused on trainer oversight to ensure effective and efficient delivery and consistency across service contractors (interviews)</li> <li>• The feedback to SCTR performance from LPA's has supported SCTR's in guiding problem solving and has been highly valuable (personal communication)</li> </ul>	
<b>Professional Development Pathway</b>		
PI continues in performance management at CATSA  <b>Realized, clear project contribution</b>	<ul style="list-style-type: none"> <li>• The PI continues to work in performance management at CATSA and is responsible for developing training and assessment for the organization at the national level (documents)</li> <li>• The PI continues to pilot continuous learning approaches within their CATSA region and implements changes to performance management and training material (interviews)</li> <li>• CATSA staff view the PI as an expert in performance management within the organization (interviews)</li> <li>• Informants commented on the PI's investment in ensuring that continuous learning is a part of organizational culture (interviews)</li> <li>• The PI continues to work closely with service contractors to share principles of continuous learning (interviews)</li> </ul>	Facilitating factors: <ul style="list-style-type: none"> <li>• The PI is passionate about and dedicated to the topic of performance management at CATSA</li> </ul>



## Research Project Assessment

### What elements of the research design and implementation supported outcome realization, and how?

An adapted version of Belcher et al.'s (2016) Transdisciplinary Research QAF was used to assess the degree to which the project employed inter- and transdisciplinary principles and enable the evaluators to elicit lessons for research design and implementation. Overall, the CASP's design and implementation aligns with principles and criteria of relevant, credible, and legitimate research that is well-positioned for use, and the project produced knowledge that is useful and used (Figure 4; see Appendix 5 for QAF results and justifications for the project assessment). The CASP was implemented appropriately, and the collaborative action research approach enabled a diverse range of organizational perspectives to inform project design (Doc1, Res1). The PI's role within CATSA and their previous experience as an LPA gave them an in-depth understanding of the topic and context, and positioned them well to influence change within the organization. The project was feasible, appropriately designed, and strategically engaged relevant stakeholders to ensure buy-in and subsequent uptake of project findings and recommendations. These characteristics supported the relevance, credibility, legitimacy, and positioning for use of the research process and the knowledge produced to support outcome realization. However, had the CASP utilized an explicit or documented ToC, this could have supported the project in recognizing and accommodating opportunities and challenges for further potential impact. Further justification of how answering the research questions would address the research problem and a better formulation of objectives would also have aided the structure and purpose of the project.



**Figure 4.** Scoring of the CASP against QAF principles of Relevance, Credibility, Legitimacy, and Positioning for Use (0 = the criterion was not satisfied; 1 = the criterion was partially satisfied; and 2 = the criterion was fully satisfied).

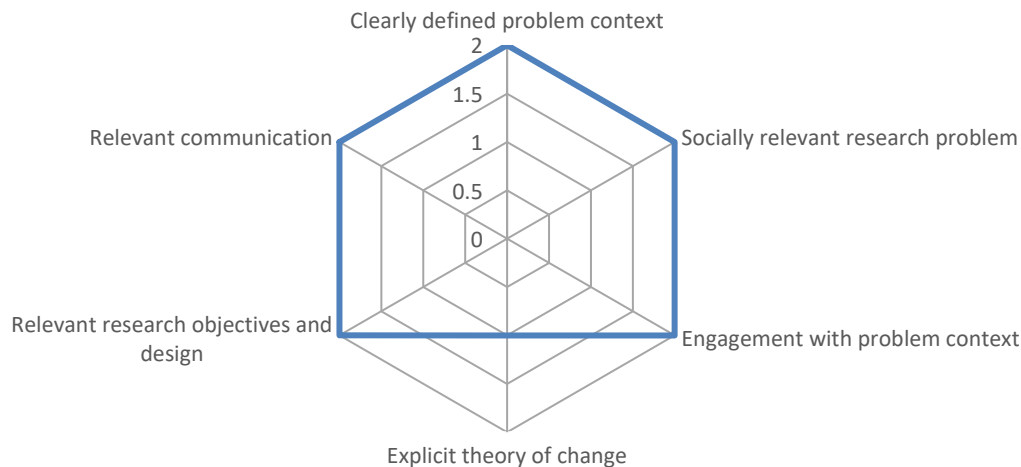
### Relevance

Figure 5 presents the scores for criteria under the Relevance principle. The CASP effectively addressed a socially relevant research problem, had relevant communication, effectively engaged with the problem context, and clearly defined the problem context. The only criterion not fully satisfied fully was explicit *theory of change*.

The CASP clearly defines the problem context and provides a contextual overview of aviation security, CATSA, and the LPA role. The thesis introduces how CATSA was created to ensure consistency in airport screening; to achieve this consistency at all levels, it is important that LPAs who were coming to CATSA from a variety of backgrounds and varying levels of competencies are held to the same professional standards (Doc1). CASP documentation makes a clear connection between the problem context and the research problem, and draws research entry points from the problem context and the PI's personal experience as a former LPA. The practical gaps of the research problem are relevant for CATSA and LPAs because of the need for systemic accreditation

for the LPA role. The PI also interacted sufficiently with the problem context to gain a breadth and depth of understanding from the literature to satisfy the criterion *engagement with the problem context*. For example, the in-depth literature review and scoping interviews indicate various system actor perspectives (e.g., participants, LPAs, senior management, sponsors) and the organizational culture are well understood owing to the PI's insider status. The PI reviewed current academic literature, including benefits and challenges of competency assessment, organizational learning, and success factors in adult learning to assist their understanding of the advantages and barriers of establishing assessments for LPAs. The PI also incorporated insights from personal experience as a former LPA and member of CATSA. The CASP's engagement with the advisory team – consisting of other regional managers of Learning and Development – also ensured there was a collective understanding of the problem context. The CASP's research design is relevant and appropriate to the problem context and justifies how the methods and engagement activities will address the research problem. The collaborative action-oriented research approach involved LPAs as the actors under study in the development of a certification program for LPAs, satisfying the criterion *relevant research objectives and design*. The PI also successfully communicated with senior management for buy-in and sponsorship of the research. The PI consulted with the advisory team for input to design, including the research and interview questions, and informants reflected positively on the communication during the research process. Findings and recommendations were presented in a variety of formats which was viewed positively by informants.

### Average CASP Relevance Scores



**Figure 5.** Project satisfaction of relevance criteria

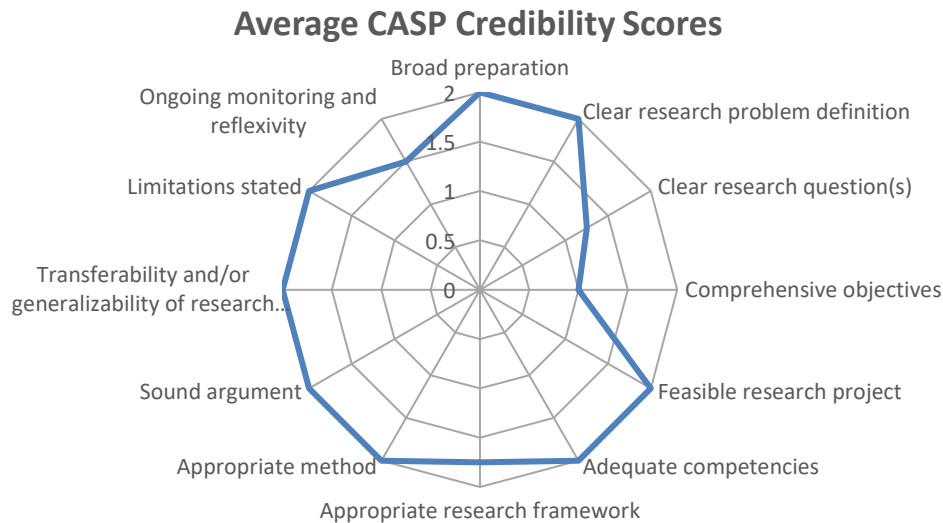
The CASP did not utilize an explicit or documented ToC. However, a ToC is implicit in the statements of intended changes of the research opportunity. CASP documentation identifies opportunities to influence changes within CATSA and indicates the intended beneficiaries of the research. For example, CASP documentation notes that LPA certification could improve operations and screening officer performance through training, improve individual performance and knowledge of the LPAs, build consistency in certification practices, and create career progression strategies (Doc1). However, assumptions underlying expected changes were not explicit, and a fully articulated ToC would have improved the strength of the thesis.

The analysis of Relevance criteria highlights the importance of the PI's position within the problem context to identify a socially relevant research problem and clearly define the problem context by situating the research in the organizational context and literature on adult learning. The PI's personal experience as an LPA and buy-in from the organization situated the CASP to influence change. However, if the CASP had leveraged an explicit ToC at the beginning of the research, this would have supported more proactive critical thinking, integration, and collective visioning among key stakeholders and collaborators; enhanced transparency and accountability of

results; helped to identify and engage key actors at project boundaries; and understand diverse roles in change processes (Belcher et al., 2019).

### ***Credibility***

Figure 6 presents the scores for criteria under the Credibility principle. The PI had the adequate competencies to undertake the research, applying appropriate methods in order to involve LPA and management stakeholders in the certification design process. The comprehensive objectives criterion did not score as highly because a singular objective guided the research. Further concrete examples of the ongoing monitoring and reflexivity within the CASP could have provided further opportunities for project adaptation to take advantage of new opportunities or address unexpected challenges or changing circumstances in the system.



**Figure 6.** Project satisfaction of credibility criteria.

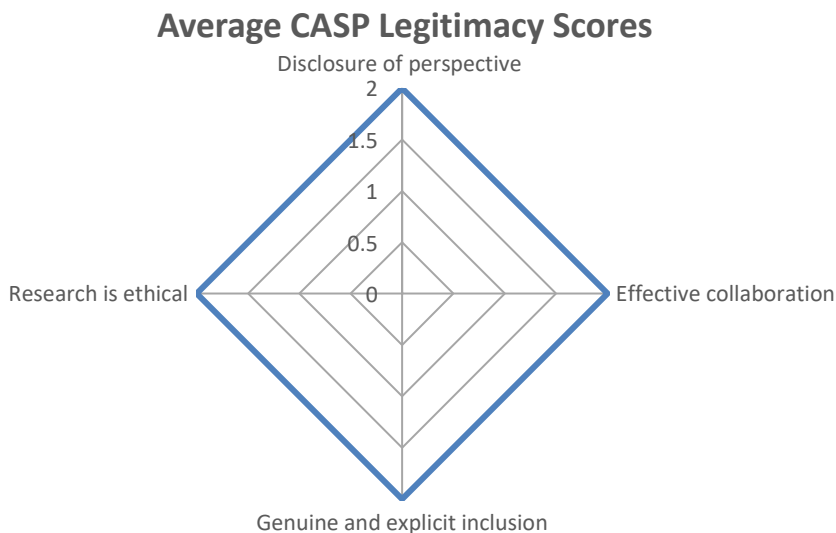
CASP documentation conveys a clear understanding from multiple topics and disciplines (i.e., competency assessment, organizational learning, adult learning, etc.) which are drawn upon to help answer the research questions. The literature review prepared the PI to apply the concepts that would support the research inquiry. Completing the literature review in advance built understanding of different stakeholder perspectives and brought concerns LPAs and CATSA management might have regarding a certification program to the PI's attention. CASP documentation articulates the importance and need for the research. For example, with the evolution of the position of the LPA through organizational growth, the addition of new technology, and additional responsibilities in the LPA role, the thesis established why it was beneficial for LPAs to have a comprehensive set of guidelines to frame expectations for the role and provide feedback on competency areas. Appropriate methods are utilized by the CASP, and project documentation clearly describes the methods and approach. Rationale is provided for the use of the World Café method to collect data from diverse participants and enable participant engagement with themes and data that came out of the preliminary interviews. All LPAs, NTCP coordinators, CATSA personnel from the Learning and Development Department, and managers from a few internal departments were invited to participate in the World Café to support a multi-perspective understanding of the topic (Doc1). Descriptions of how the methods were applied and how results were derived lends transparency to the approach and thesis. Although CASP documentation acknowledges the limited transferability of the specific recommendations to other departments in CATSA as the findings are LPA-specific, the potential for transferability of a user-informed comprehensive certification program development process to other contexts is briefly discussed. Informants also discussed how the findings on organizational learning and certification were transferable. For example, the CASP was discussed as "well timed" (Doc1) as the feedback and results could be helpful with the certification process for other CATSA positions and the recurrent learning and certification program.

Research objectives are not described in the CASP thesis; a singular objective was only found in a copy of the invitation letter sent to CASP participants included in an appendix of the thesis (Doc1). A better formulation of objectives in the main body of the thesis would have aided the structure and purpose of the project. The CASP's appreciative approach enabled reflection to support ongoing monitoring and reflexivity. Processes of reflection and key aspects that were reflected upon include the research approach, methods selected, World Café question framing, researcher positionality, and bias, which are mentioned in the thesis (Doc1). However, concrete examples of these reflections could have been discussed. Consultations with the advisory team supported reflection and informants indicated that the PI was critical and reflexive in the design and implementation of the project. For example, the PI spent time reflecting on how to conduct the research in order to make sure it was credible and how to manage their two roles as a researcher and a manager professionally.

Overall, the PI had the adequate competencies to support the CASP through their internal position within the organization. Broad preparation brought clear understanding from relevant topics and disciplines, as well as the perceptions of CATSA staff to help answer the research questions. Appropriate methods were utilized to ensure a collaborative approach to the development of an LPA certification program by gaining a wide variety of perspectives and inputs. However, a more thorough formulation of objectives and their explicit inclusion within CASP documentation would have reinforced the direction of the project. Also, more concrete examples of processes of monitoring and reflection could have provided opportunities for adaptation of the research process to take advantage of new obstacles, opportunities, or circumstances (Belcher et al., 2016).

### ***Legitimacy***

Figure 7 presents the scores for criteria under the Legitimacy principle. The CASP ensured the research was ethical by following RRU ethical review processes and considered organizational and power dynamics of the PI's managerial role when inviting staff to participate in the research activities. The PI's positionality, transparency, collaborative approach, and inclusion of a wide range of CATSA actors increased the trustworthiness of results.



**Figure 7.** Project satisfaction of legitimacy criteria

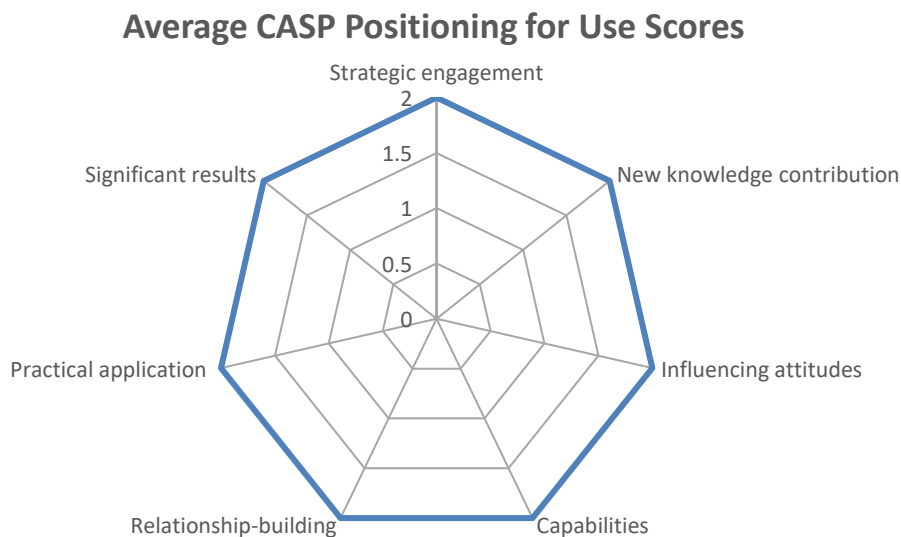
CASP documentation discusses the PI's positionality as an employee of CATSA and their role as a manager. Partnerships and sources of support are also noted in the thesis which briefly acknowledges the potential for bias. The PI received official support and sponsorship from CATSA to carry out the CASP with a shared understanding of goals and expectations. The thesis also discusses how the methods selected were intended to reduce researcher bias and the PI was cognizant of the potential implications on the findings. For example, the PI was aware that LPA certification should not necessarily mimic their own experience of post-secondary courses and accreditation processes, but instead should be adapted for the needs and expectations of LPA audiences. The PI was also aware of their own bias and power held as a manager within CATSA, and clearly distinguished their identity as a

researcher from their role as Learning and Development Regional Manager. The PI collaborated with the sponsor (Director of Operations for CATSA), leadership, and the advisory team, with members of the advisory committee reflecting positively on their relationships with the PI. Informants also perceived the CASP to be collaborative and appreciated how they were brought on as collaborators to develop the pilot LPA certification program. The CASP also supported genuine and explicit inclusion by representing and including a range of stakeholders across CATSA in the CASP (e.g., 90 percent of LPAs and representations from across Canada). CASP documentation discusses the efforts made to enable diverse perspectives to be shared and clearly describes the participants roles, perspectives, and contributions to the research process. The CASP achieved “*mastery in the area of ethics*” (Res1) by adhering to RRU’s Research Ethics Policy and Tri-council Policy. Invitations for interviews and the World Café were sent by a third party to reduce pressure on the PI’s subordinates to participate. Participants gave informed consent, and anonymity and confidentiality were maintained. A section of the CASP thesis is dedicated to ethical considerations for human dignity, informed consent, privacy and confidentiality, justice and inclusiveness, reducing harm, and enhancing benefits.

The CASP was an ethical project that successfully planned for potential harm, such as LPAs’ possible loss of confidence and level of frustration in being assessed and certified. A wide range of CATSA actors were included in the research process to ensure the applicability of and support to the LPA certification processes. Overall, the CASP was collaborative, transparent, and shared ownership over the LPA certification process with participants and members of the CATSA community, which supported uptake and use of CASP recommendations.

### ***Positioning for Use***

Figure 8 presents scores for criteria under the Positioning for Use principle. This principle manifested clearly in the CASP’s contribution to a significant outcome. The CASP strategically engaged LPAs and gained the support of CATSA and the sponsor to position the research for use. The CASP presented recommendations for an LPA certification program which was piloted and tested post-project. The CASP effectively contributed to new knowledge on assessment and adult learning within the organization, influenced attitudes around assessment and the LPA role, and built the PI’s and LPAs’ capabilities to contribute to significant results.



**Figure 8.** Project satisfaction of effectiveness criteria

The CASP contributed to significant results as all ten intermediate and end-of-project outcomes were fully or partially realized, with all indicating clear contribution of the project. The CASP resulted in positive outcomes for participants, LPAs, and CATSA, and was a direct catalyst for CATSA’s pilot LPA certification program. Six LPAs received certification through the pilot and informants discussed how the continuous learning philosophy supported by the CASP would continue beyond the thesis (Res1). Through strategic engagement, the PI was well

positioned to influence the context because of their combined former experience as an LPA and manager at CATSA. Gaining the support of the organization for the CASP provided the opportunity to influence the creation, design, and implementation of the LPA certification program. The CASP made new knowledge contributions, expanding academic knowledge, organizational knowledge, and the PI's own knowledge. For example, the CASP filled an academic knowledge gap by documenting aspects of the CATSA context through the first applied research project on the topic in this specific context. The CASP informed individual and organizational learning by highlighting the importance of consistency, measuring consistency and training (Res2). The CASP also contributed to knowledge on organizational practice gaps and LPA-informed recommendations for certification standards (Doc1, Prac6, Res2). Positive feedback from CATSA staff following the pilot indicates positive attitudes toward LPA certification (Prac5, Prac6, Prac11, Prac12, Prac13, Res2). The CASP also supported capabilities by allowing the PI to build upon their own research capacities; the PI has since transferred these skills to other aspects of their job (Doc1, personal communication). The CASP also provided a professional development opportunity for LPAs; LPAs who completed the pilot had their capabilities and capacities developed (Prac6, Prac11, Prac12, Prac13, Prac14). Mutual interests between CATSA, the sponsor, LPAs, and the PI were recognized and leveraged to strengthen relationship-building within the organization. Trust was fostered with CATSA management via continuous consultations, and trust was fostered with research participants through participatory World Café methods. The positive research experience bolstered the PI's professional working relationships within CATSA, resulting in increased coaching and mentoring as LPAs approached the PI for advice following the CASP (Prac6, Prac16). The CASP developed and presented recommendations for a LPA certification program to CATSA which were piloted and tested following the project (Doc1, Doc3, Doc4, Doc5, Doc8, Survey1). The CASP set the standard for assessment within CATSA and opened the door for LPAs to achieve a level of subject matter expertise (personal communication).

Overall, the CASP contributed to significant results by acting as a catalyst for CATSA to focus on the topic of LPA assessment and certification strategies. The CASP presented recommendations which were taken up by CATSA through a pilot LPA certification program. Strategically partnering with CATSA and including LPAs in a participatory action-research process supported the significant results of the CASP. Subsequently, organizational changes outside of the PI's sphere of control led to challenges in the continuation of the formal LPA certification program. However, the PI and LPAs continue to use knowledge learned through the project, and CATSA have now standardized assessments that are in-line with the PI's original recommendations indicating a significant outcome of the project.

### **To what extent and how did the project engage effectively with relevant stakeholders?**

Informants believed that the CASP was a “*very much open and facilitated* [process]” (Prac8). However, one informant suggested that the inclusion of Transport Canada in the research process may have provided additional content in terms of training and development (Prac6). The CASP benefitted LPAs, CATSA, screening officers, and the travelling public by presenting the research findings in a way that maximized the knowledge of the organization to build better stakeholder relations, ultimately resulting in positive change (e.g., more consistent screening practices) (Doc1). The CASP's stakeholder engagement is characterized by three stages: engagement during the project, end-of-project engagement, and post-project engagement.

#### ***Engagement During the Project***

The CASP planned and implemented various engagement activities during the project to engage relevant actors within CATSA to contribute to outcomes pertaining to the increased awareness of the topic and understanding of the value of assessment and certification across the organization. Sponsorship from senior managers within CATSA supported buy-in and the promotion of the research throughout the organization (Prac6). This PI constantly engaged with the sponsors and advisory team throughout the project to keep them apprised of progress and request their feedback and comments to ensure the relevance of project outputs (Prac6). The advisory team also assisted with reviewing the research design, questions, and methods for data collection, and provided feedback to the subsequent recommendations arising from the data (Doc1). The action research approach ensured



that answering the research question was an inclusive process to discover collective solutions and suggestions for change initiatives (Doc1). The collaborative method of World Cafés provided a positive experience for all those involved and “*was the first time that people felt like they got a say in something*” (Prac8).

Although a large proportion of actors were included in the research process at the time, some informants were unsure as to their level of contributions because of the time that had passed since the research process (Prac10, Prac12, Prac13, Prac15). However, some informants discussed their positive engagement in the CASP, indicating that the research provided a participatory learning experience for LPAs to develop their practical skills and provide feedback and recommendations to the future of their role and certification (Prac4). The PI is noted to have successfully engaged with LPAs throughout the research process by clearly explaining the research intent and findings in a way that was appropriate for the target audience (Prac4). This removed possible negative connotations around the notion of assessment (Prac4). The thorough engagement strategy contained all necessary aspects to support the uptake and use of the research findings (Prac6). Informants connected the success of the CASP to the way the PI engaged actors throughout the process, valued the input of all stakeholders, and ensured ownership over the process for LPAs (Res1).

### ***End-of-project Engagement***

The CASP utilized opportunities for strategic engagement on LPA assessment and certification nearing the conclusion of the project. The CASP’s EoP engagement was predominantly for dissemination purposes and the piloting of the LPA draft certification framework. Sponsors and the advisory team were de-briefed on the findings and engaged for their feedback to the next steps in terms of presenting the pilot certification program to LPAs in a way that was not daunting but could be viewed as a self-improvement tool (Prac6). The PI presented CASP findings at a CATSA regional meeting to share outputs more widely within the organization (Prac8, Prac16). Senior management was also briefed on the research findings. One informant described the PI as “*an open book*” (Prac6) and fully engaged in terms of presenting CASP outputs. However, one informant stated that CASP findings were not shared on a wide scale or discussed in depth (Prac3); this may be in part owing to the time that has passed since the end of the project and difficulty recalling engagement activities. CASP findings were not shared outside of CATSA. Findings were also not shared through other academic channels such as journal articles or at conferences as influencing academia was not a priority objective of the CASP. Ultimately, a pilot certification was presented and implemented. LPAs were consulted by the PI for their feedback on the pilot process in order to make improvements (Prac4, Prac12). Informants discussed how the pilot was positively received when first implemented because of the inclusion of LPAs views throughout the research process (Prac8).

### ***Post-project Engagement***

The PI continues to engage with CATSA in their role as Regional Manager of Learning and Development post-project to advance the standard of adult learning and promote consistency across CATSA operations. The PI also continues to lead presentations and meetings nationally on the topic of learning and development more generally, using findings and lessons learned from the CASP research process (Prac10, Prac16). The PI regularly collaborates with colleagues at CATSA and service contract organizations to discuss concepts of learning and development to enhance screening practices within Canadian Air Transportation (Prac9). The PI also supported service contract agencies to take up and use World Cafés in their own activities, influenced by the experience of the CASP’s initial Cafés, recommendations, and practical value for multi-stakeholder engagement (Prac9).

### **To what extent were the findings sufficiently relevant to achieve the stated objectives?**

The objective stated within the appendices of the CASP thesis was to “establish a collaborative process to examine possible assessment methods for the certification of LPAs at the Canadian Air Transport Security Authority (CATSA)” (Doc1). This objective was realized by the CASP. The project elicited learning from LPAs and other CATSA staff involved in learning and development by using participatory processes to gather a multi-perspective understanding of key LPA competences and the future of the LPA role, and identify benefits and challenges of a LPA certification program. This established recommendations for the future of the LPA role, certification, and principles for certification management.

Indicated by the QAF assessment, the CASP addressed a socially relevant research problem by supporting CATSA in its mission of protecting the public by securing critical elements of the air transportation system. The CASP aimed to do this by investing in the development of employees to ensure quality performance and increasing ability to achieve consistency in airport screening (Doc1). Although informants discussed how CATSA as an organization has always focused on supporting adult-learning, there was little conversation and no prior initiatives taking place on the topic of LPA assessment and certification strategies prior to the CASP. Impressions of the research findings' relevance are inferred from informants' comments regarding how the findings have supported them within their role at CATSA and been used in practice. For example, informants discussed how CATSA and service contract organizations have used the CASP findings to leverage learning and development opportunities and positively influence the culture of screening towards continuous learning (Prac8). CASP findings were also integrated into CATSA standard operating procedures (SOP) and supported changes in organizational policy (e.g., implementation of the onboarding checklist) (Prac12, Prac13). The findings and conclusions of the CASP were substantiated by evidence in the literature and empirical evidence, and were triangulated through the multiple data collection methods (Res1). Informants found the findings to be relevant because of the PI's insider knowledge of the context and their position to implement change (Res1, Res2). Ultimately, the draft LPA certification was piloted successfully within CATSA and received support from managers throughout the organization, highlighting the relevance of the CASP findings. Elements of the CASP findings continue to be used within CATSA practices such as the onboarding checklist, revealing the findings' utility across the organization (Prac12, Prac13).

### **To what extent and how are target audiences aware of and using the project outputs?**

The CASP contributed to knowledge outputs and social process outputs. Knowledge outputs of the CASP included the benefits (recognition of expertise, gained credibility, increase in self-efficacy, and greater job opportunities) and challenges of certification (time, resources, organizational support, and potential reluctance by LPAs); design elements for LPA certification; recommendations for the future of the LPA role and certification; principles for certification management; and the draft certification framework. Social process outputs include the forum for discussion around LPA certification.

Out of 18 informants, all but two were aware of the project and five informants who were aware of the project could not recall or did not have an in-depth understanding of project outputs. This indicates a reasonable level of awareness of project outputs among target audiences. Informants' responses focused on the awareness and utility of the CASP in terms of the pilot certification project that resulted, increased awareness and understanding of the need for standardized processes, and the principle of continuous learning becoming instilled as a norm within the LPA role and CATSA more widely. The CASP leveraged support from senior management within the CASP and engaged LPAs in the research process to increase awareness of the project and support the dissemination of outputs throughout the organization. Findings were shared through the thesis, presentations to the training delivery management group and senior managers, discussions with the PI's team, and World Cafés. Recommendations were based on a multi-perspective understanding of the LPA role, grounded both in the literature and participants' World Café inputs (Doc1). CASP recommendations suggested strategies for the design and implementation of an LPA certification program at CATSA and were deemed to be relevant and applicable as they were subsequently taken up and used by CATSA within the pilot certification framework.

### ***Use in Practice***

CASP outputs have been applied in CATSA's practices. For example, CASP knowledge outputs (e.g., benefits and challenges to certification, design elements for certification, etc.) changed the way CATSA and service contract organizations leverage learning and development to positively impact operational change and to change culture (Prac8). CASP outputs (including the draft certification framework and forum for discussions) also helped to change the culture of screening and developed the relationship further between CATSA and service contractor organizations (Prac8). Knowledge outputs of the CASP, particularly the LPA competency areas, are also noted to have been integrated into CATSA SOPs (Prac13). The CASP raised the importance of consistency and the



need to have instructors at every level of airport security operations using the same techniques and offering comparable programs and training (Prac8). World Cafés were adopted into organizational practice by both CATSA and service contractor organizations, which have added a value to inform practices and continue to be employed (Prac9). For example, the World Café method is now used by CATSA to develop corrective actions and continuous improvement approaches (Prac9).

Informants also discussed the use of CASP outputs in their individual practice. For example, the knowledge of adult learning gained by LPAs who were part of the research process has supported LPAs in their own instruction as they learned elements they would not have without the CASP process (Prac4, Prac10, Prac13). Informants discussed how the CASP had changed how some LPAs were instructing and facilitating training as a result of the new knowledge gained (Prac10). Project activities and findings challenged LPAs to consider their own ways of working, which resulted in some informants rethinking their training practices and adopting the notion of continuous learning (Prac8). LPAs have taken some of what they learned through the CASP process and distributed it to their colleagues to broaden perspectives (Prac4). This included knowledge on the difference in adult learning methods and the need to present material and train based on these different methods (Prac4). The CASP provided knowledge on the difference between teachers and trainers and the different methods in which adults learn; this knowledge now constitutes part of programs delivered to screening contractors, supervisors, and trainers (Prac13). LPAs have used CASP knowledge outputs to improve the consistency of their training which has had a spillover effect to screeners because LPAs have established a more polished delivery of information (Prac2, Prac4). The pilot certification framework is described as an influential output which has enhanced the credibility of both LPAs and screening officers (Prac8).

### ***Use in Policy***

There is minimal discussion of the use of CASP outputs in organizational policy. However, informants noted how CASP outputs had fed into the onboarding checklist. The CASP provided CATSA managers with the opportunity to reflect on the LPA role, in particular, the types of competencies the organization is looking for within LPAs (Prac6). This reflection, as well as the PI's continued work on the topic, influenced the onboarding checklist. This formal checklist was created for LPAs that are new to the role and contains a step-by-step guide to the knowledge and skills which new LPAs need to obtain and demonstrate within certain timeframes (Prac12, Survey1).

### ***Use in Academia***

Although contributing to the academic knowledge base was not an objective of the CASP because of the highly specialized topic and nature of CATSA as a security organization, one informant discussed how CASP outputs had been used within the academic sphere (Res2). For example, RRU uses the CASP thesis as a model for other students in subsequent cohorts of the MAL program to inspire ideas on how methods can be used to ensure student research is relevant and addresses a research problem. As an exemplar project, the CASP demonstrates how to design meaningful research that contributes to organizational change through the integration of action research methods (Res2).

### **How does Royal Roads support student success in research?**

RRU and the MAL program played a key role in supporting the success of the CASP and the PI. The program is focused on helping students to engage with stakeholders on a particular issue and uncover what stakeholders believe are the key elements needed to move forward on the topic (Res1). The action-orientated nature of the MAL program supports the development of leadership skills and competencies to support students in accomplishing aspects specific to their role (Res2). The program is not fundamentally focused on teaching students how to do research, but its goal is to teach students how to use engagement strategies to build leadership skills and competencies for informed decision-making on the part of organizational leadership (Res1). RRU teaches students to identify key actors who need to participate, uncover what would be meaningful to these actors, and how students can create an environment to ask questions that are open-ended and allow key actors to view participation in research as an opportunity to contribute to a larger change process; all of which were key concepts that supported the CASP to influence organizational change (Res1). Students are encouraged to obtain sponsors

within their organization to assist them with moving change forward and mobilizing the research (Res1). For example, the PI recruited sponsors from within CATSA to ensure the research and its outputs were well-positioned for use within the organization.

MAL students receive a degree in leadership rather than a degree in research; understanding action-based inquiry is essential to the program to allow students to use inquiry as a mechanism to develop a broader understanding of leadership and skillfully engage stakeholders (Res1). The MAL program also supports students in understanding organizational change from an experiential perspective (Res1). The MAL's focus on leadership and the learning process, including action research, were perceived to have been the foundation of the CASP's success in realizing outcomes (Res1). The MAL program provides students with knowledge and skills on how to create an effective inquiry, teaching action-oriented methods and epistemology needed to engage stakeholders effectively (Res1). For example, the PI learned the value of the World Café process as part of their methodology courses (Res1, Res2). Students are also exposed to ToC concepts to support planning, monitoring, and evaluation for learning (Res1). Although the PI was aware of the underlying change process, a fully articulated ToC was not used within the CASP. The program positively influenced the CASP and enabled the PI to design a robust research methodology (Res2). The MAL provided the PI with the opportunity to learn new processes and collaborate with key CATSA staff to create outputs that were both useful and used (Res1). As well as receiving feedback from the faculty supervisor in an ongoing process, the cohort arrangement at RRU was also useful as it provided the PI with external suggestions of how to move forward in the CASP (Res1, Res2).

### **What lessons about effective research practice can be learned from this case study?**

Interview informants discussed a variety of themes that support effective research practice, including: research that addresses an everyday operation (i.e., a real-world problem); research that provides a solution to a problem; research that is collaborative and thorough; research that is unbiased and results-based; and research that uses appropriate language for the target audience. Within the CATSA context, informants described effective research as being beneficial or of value to the operation or operational structure (Prac1, Prac6). For example, effective research supports actors in staying current in their work and improves the way in which actors work or deliver a service (Prac6). More generally, effective research produces outputs that can be applied to the operation or to business intelligence (Prac1). Research that is informative and instructive, fills a knowledge gap, and ultimately drives change management was given as examples (Prac9, Res1). Research should involve all necessary stakeholders and key actors, and explore all available evidence, including previous research on the topic and available documentation to obtain a complete understanding of the research problem (Prac8, Prac10, Res1). This ensures that a wide variety of perspectives are included within the research and adds value for stakeholders (Prac16, Res1). Effective research should be unbiased and provide honest results (Prac3). Sources of evidence should be credible and appropriate to answer the research question (Prac14). For example, if research is aiming to contribute to program changes, it must review before and after situations in order to measure effectiveness (Prac15). Effective research also provides a solution to the real-world problem and has a practical application to support improved processes within the context (Prac2, Prac5, Prac11, Prac13, Res1). It is also important that effective research contains a methodology and argument that can be understood in appropriate language for the target audience; effective research does not necessarily confirm the hypothesis but does lead to recommendations (Prac13). Effective research has a clear goal in mind (including an in-depth understanding of the end-goal) and an awareness of alternative explanations and how the research is expected to lead to change (Prac15). Effective research manages time and resources effectively and efficiently, including recognizing opportunities and challenges which may affect the overall goal (Prac2).

### **Project Lessons**

The CASP supported the realization of outcomes across multiple pathways by using mechanisms such as filling knowledge gaps, co-producing knowledge, leveraging reputations, and strengthening and creating coalitions to support positive changes for the participants involved in the research process and CATSA more generally. Outcomes were also realized in part owing to the strategic engagement of relevant actors (LPAs and managers)

and the alignment of the research with parallel issues at CATSA which enabled elements of the CASP's process and outputs to be relevant, credible, legitimate, and well-positioned for use. However, had the CASP utilized a ToC from project inception and formulated more thorough objectives, these qualities would have supported deeper critical thinking, integration, and collective visioning among key stakeholders to better inform the structure and purpose of the project (Belcher et al., 2019). Other research projects could benefit from the lessons gained from the CASP on how to conduct research to support organizational change and the benefits of strategically leveraging partnerships to ensure support for the research and its outputs.

- **Leveraging the PI's insider perspective of the organization, as well as their knowledge of the LPA role, supported effective data collection and uptake of the research outputs.** The PI's position as Regional Manager of Learning and Development and prior experience as a LPA enabled the PI to interact sufficiently with the problem context and positioned them well to influence change. The PI had in-depth familiarity with the LPA role, its responsibilities, and day-to-day challenges. Their insider perspective provided them with pre-established networks, which played a crucial role in gaining organizational support for the CASP and aligned the research closely with parallel issues and initiatives.
- **Applying participatory methods with key system actors and target audiences can gather a diverse range of perspectives and ensure co-ownership of the project outputs, thus increasing the likelihood for subsequent uptake and use.** The participatory methods used in the CASP, including action research and the World Café, supported co-production of knowledge and ensured a large part of the system could be involved in the research in the timeframe available. The PI received official sponsorship from CATSA through the Director of Operations to complete the CASP, which fostered a shared understanding of goals and expectations. The advisory team comprising of other Regional Managers of Learning and Development also ensured a collective understanding of the problem context. Collaboration through the CASP research methods also built trust among target audiences (e.g., LPAs) and garnered support and commitment for the LPA assessment and certification process. The collaborative methods used by the CASP successfully brought stakeholders together to take action to solve the research problem. Mutual interests were recognized through the participatory methods and ultimately leveraged to contribute to relationship-building and trust. By collaborating with the advisory team and the project sponsor throughout the research process, the CASP ensured trust in the project outputs and enhanced the rate of uptake and use of findings by ensuring their relevance and application to the target audience.
- **Utilizing an interdisciplinary approach ensured successful application of academic learning theories into the practical application of LPA assessment and certification.** The interdisciplinary approach allowed the PI to gain an understanding from multiple disciplines including adult learning theory, benefits and challenges of competency assessment, and organizational learning principles which were vital in the creation of the pilot LPA assessment and certification strategy. Successful knowledge dissemination through participatory methods resulted in the uptake and use of academic theory within the practice of CATSA and LPAs. The CASP successfully internalized theory as usable knowledge by bringing understanding together with participatory methods of the CASP and exposed LPAs to interdisciplinary perspectives on the topic.
- **An in-depth understanding of how a project is expected to contribute to change (e.g., through ToC) can support recognition of further opportunities for potential impact.** The CASP utilized an implicit ToC through the statements of intended changes of the research opportunity, indicated opportunities to influence changes within CATSA, and identified the intended beneficiaries of the research. This implicit ToC supported a shared understanding of the research project, increased trust, and garnered organizational support for the research. However, if the CASP had utilized an explicit or documented ToC, it likely would have enhanced project contributions to change and made explicit the assumptions underlying expected change. The use of an explicit ToC could also have been used as a boundary object to support and achieve a collective vision for change. Being aware of social theory and how it can be used to leverage

opportunities for change can support contributions to intended outcomes in complex socio-ecological systems (Stachowiak, 2013).

### Contextual Lessons

The CASP was well-situated within the problem context, with entry points drawn from the PI's in-depth knowledge of the organization and previous experience of the challenges of being an LPA. This factor played a key role in the accomplishments of the CASP and limited the effects of contextual barriers for research conducted within a security organization.

- The nature of CATSA as a security organization subsequently makes it challenging for outsiders to complete research on organizational operations or to have access to target audiences for data collection. The PI's managerial position within the organization allowed them to gain access to LPAs as research participants and gain the support of decision-makers within CATSA (e.g., Director of Learning and Development). Future research in the context of CATSA and other security organizations should be led by those with access to an in-depth understanding of operations and in positions of trust within the organization to ensure buy-in from stakeholders and support the uptake and use of research outputs. However, insider researchers should also ensure that they clearly distinguish their identity as a researcher from their role within the organization being studied to minimize bias and lessen power dynamics.
- The specialized topic of LPA assessment and certification strategies at CATSA also meant that no previous research had explored the issue. CATSA had not previously made formal inquiries about the assessment and certification methods of LPAs, thus the research filled a clear knowledge gap. However, having no previous research on the topic made it important that the CASP was grounded in a variety of academic literature to support rigour and the potential transferability to other security organizations interested in implementing change. Future research in this topic should also make use of social science literature to expose audiences to new perspectives and ground results in social and organizational change theories.
- When completing research in the topic of assessment and certification, notions of uncertainty surrounding testing and examination can arise with participants. Participatory methods utilized within the CASP ensured co-ownership and presented participants with the opportunity to ask questions and develop an assessment and certification process that was in-line with the necessary competencies for the LPA role and different learning styles. Future research on the topic of assessment and certification should be as participatory as possible to minimize feelings of uncertainty.

### Evaluation Limitations

The following evaluation lessons and limitations should be considered with regards to the Outcome Evaluation approach, data, and results.

**Limitations of the analytical framework:** Having the PI identify informants to test outcomes can increase the risk of introducing bias into data collection as informants may be selected for their likelihood to reflect positively on the project's results and outcomes. To address this limitation, snowballing for additional perspectives and sources of information was undertaken, and a variety of documents were reviewed. The period of time between the inception of the CASP and the development of the project ToC (i.e., more than ten years) also resulted in a number of unexpected outcomes being included within the ToC. This meant that the ToC development process relied greatly upon the PI's recall of the project to document an up-to-date ToC.

**Limitations of the data and results:** Assessments using the Outcome Evaluation approach rely on informant perspectives, which can be affected by several factors, including time. Recall of project details and processes was difficult for many informants. There were also some challenges in separating outcomes related to the CASP from the PI's continued work on the topic. For example, the PI has contributed to a number of changes in CATSA over the past 10 years in the Learning and Development Department that were aligned to the same purpose of the CASP (i.e., increased consistency and effectiveness across Canadian airport screening operations).

## Recommendations

The CASP successfully contributed to a diverse set of outcomes across multiple impact pathways. The CASP demonstrated many characteristics of an effective transdisciplinary project to support outcome realization, including effective engagement with the problem context and alignment of the research with parallel issues, appropriate use of participatory methods for data collection and dissemination, ensuring adequate competencies were reflected in the research and advisory team, and contributing to a significant outcome. These results align with Belcher et al.'s (2019) findings on the connection between transdisciplinary characteristics, the leveraging of diverse mechanisms, and a greater diversity of project contributions across multiple impact pathways. The PI also had a number of characteristics (e.g., their passion and continued dedication to the topic) which increased the likelihood for research uptake. There were also elements that could be strengthened. The evaluation concludes with the following recommendations for future research, which can apply to other RRU graduate student research projects or research more broadly.

1. **Leverage the PI's insider perspective, as well as in-depth knowledge of the context to support effective data collection (e.g., access to participants) and uptake of research outputs through aligning the research with organizational initiatives and mandate.** For example, the PI's insider perspective provided them with pre-established networks which played a crucial role in gaining organizational support for the CASP and aligned the research closely with parallel issues and initiatives. Leveraging strategic partnerships and actively seeking collaboration with relevant actors (e.g., decision-makers) and boundary partners help foster organizational change by providing access to data, support for the project, and supporting dissemination and outreach.
2. **Utilize participatory methods with key system actors and target audiences to gather a diverse range of perspectives and ensure co-ownership to increase the likelihood for uptake and use of research outputs.** Within the context of research in assessment and certification strategies this can also minimize feelings of uncertainty around the topic.
3. **Interdisciplinary approaches can ensure the successful application of academic learning theories into practical application to support the rigor and transferability of findings to other contexts.** For example, interdisciplinary approaches that enable participation and knowledge co-generation can support the uptake of academic knowledge into practice to ensure the effectiveness and practicality of research outputs, particularly where no previous research has explored the topic.
4. **Use a ToC to plan and monitor progress in order to support the recognition of further opportunities for potential impact.** This includes developing explicit, realistic, and logical assumptions and theories about how and why a research project is expected to contribute to a change process. Developing a ToC and its underlying theories and assumptions at project inception can help to target project activities, as well as leverage opportunities that arise throughout the research process. Although the CASP identified implicit statements of intended changes, fully articulating assumptions underlying why change is expected would have improved the strength of the thesis. Understanding the underlying causes of expected change can also facilitate learning to support the effectiveness of future research as each research project will subsequently serve as a test of hypotheses (Weiss, 1997).
5. **Future research in security organizations should be led by those with an in-depth understanding of the context and in positions of trust to ensure buy-in, applicability, and uptake of research outputs in order to contribute to sustainable organizational change.**

## Appendix 1. Evidence Sources

Code	Class	Author(s)	Reference	Date
Doc1	Master's thesis	Martens	Martens, S. (2009). Identifying Canadian Air Transport Security Authority Learning and Performance Advisor Assessment and Certification Strategies (Master's thesis, Royal Roads University, Victoria, Canada).	2009
Doc2	CATSA documentation	CATSA	Competency guide for all CATSA LPAs, unpublished	n.d.
Doc3	Email communication	Anonymous	Subject: LPA Job Profile	2009
Doc4	CATSA documentation	CATSA	LPA Certification Program (Part 1), unpublished	n.d.
Doc5	CATSA documentation	CATSA	LPA Certification Program (Part 2), unpublished	n.d.
Doc6	CATSA documentation	CATSA	LPA Certification Proposal, unpublished	2009
Doc7	CATSA documentation	CATSA	LPA Process Description, unpublished	n.d.
Survey1	Survey	PI	Unpublished survey response.	2019
Prac1	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac2	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac3	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac4	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac5	Interview	Practitioner informant	Unpublished case study interview transcript	2020
Prac6	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac7	Interview	Practitioner informant	Unpublished case study interview transcript	2020
Prac8	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac9	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac10	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac11	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac12	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac13	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac14	Interview	Practitioner informant	Unpublished case study interview transcript	2020
Prac15	Interview	Practitioner informant	Unpublished case study interview transcript	2019
Prac16	Interview	Practitioner informant	Unpublished case study interview transcript	2020
Res1	Interview	Researcher informant	Unpublished case study interview transcript	2019
Res2	Interview	Practitioner informant	Unpublished case study interview transcript	2020

## Appendix 2. Semi-structured Interview Guide

A) General questions about the respondent, their expertise on the topic, & recent/significant changes in topic (purpose to build rapport & clarify the context)

Main Question	Probes	Intent: What we are trying to find out <b>Do NOT ask these directly.</b>
1. What is your role within [organization]?	<ul style="list-style-type: none"> <li>How is your work related to LPA assessment and certification strategies?</li> <li>How long have you been doing this kind of work?</li> </ul>	<b>Understanding the respondent's job/organization and the relevance of the topic to their work.</b> Finding out the expertise of the respondent and their professional connection to the topic, as well as their influence on the topic of focus.
2. What role does [organization] play in LPA assessment and certification strategies?	<ul style="list-style-type: none"> <li>How long has your organization been involved in work related to LPA assessment and certification strategies?</li> </ul>	
3. What are the main challenges related to the topic of LPA assessment and certification strategies?	<ul style="list-style-type: none"> <li>What is the reasoning for these challenges?</li> </ul>	<b>Personal expertise &amp; perceptions on the topic of focus.</b> Interviewee's knowledge level, understanding, and perceptions on the problems & issues relevant to the focus of the project – what do they think the problems are and how they frame the problems. QAF: Rel1, Rel2, Rel3, Rel5
4. What have been the most important developments related to LPA assessment and certification strategies in the last 10 years?	<ul style="list-style-type: none"> <li>In the discussions, events, ideas, institutions, policy, and/or practice?<sup>2</sup></li> <li>What are the implications of these developments?</li> <li>Why do you think these are important?</li> </ul>	<b>Understanding people's perceptions of the situation and identifying possible changes in policy &amp; practice.</b> Getting an idea of the way in which the issues in question are perceived by interviewees, and get a range of various perspectives/understandings of the developments, causalities & people's values in relation to issues. QAF: Rel1, Rel2, Rel3
5. Who are the key players in the discussion, policy, or practice of LPA assessment and certification strategies?	<ul style="list-style-type: none"> <li>What role do government/academic/NGO /international/ private sector/communities play<sup>3</sup>?</li> <li>In what ways have they (each) been influential?</li> </ul>	<b>Understanding people's perceptions of who is who in changing policy &amp; practice.</b> Getting an overview of who people consider as key actors in the process. This question will also provide insights about the power dynamics between the stakeholders (e.g. who's got power over whom). QAF: Rel1, Rel3
6. What information/knowledge has been the most influential in relation to LPA assessment and certification strategies?	<ul style="list-style-type: none"> <li>Who is promoting the information/knowledge or event in question?</li> <li>In your opinion, has the information [what they mentioned] influenced policy and practice? How? Probe for examples.</li> </ul>	<b>Understanding what kind of knowledge is used in decision-making in general.</b> Getting a better picture of what kind of knowledge & other factors are influencing LPA assessment and certification strategies, and from where the ideas are coming. More detailed information about possible changes in policy & practice because of new information/scientific knowledge. QAF: Rel1, Rel2, Rel3

<sup>2</sup> All terminology should be adjusted & verbally explained so it is appropriate to each interviewee (please record any adaptations in the post-interview notes).

<sup>3</sup> It is not necessary to ask all questions to every informant – the list merely illustrates what kind of information we are trying to find out.

**B) Understanding links between knowledge sharing & decision-making processes (purpose to assess important sources of influence on policy & practice)**

Main Question	Probes	Intent: What we are trying to find out <b>Do NOT ask these directly.</b>
7. When doing work related to LPA assessment and certification strategies, where do you (or your organization) get the information you need to do your work?	<ul style="list-style-type: none"> <li>What kinds of information?</li> <li>How does that information help guide decisions around what your organization does?</li> </ul>	<b>Understanding what kind of knowledge is used in decision-making in general.</b> Getting a better picture of what kind of information is seen as important and/or used in decision-making (scientific or non-scientific). QAF: Rel7, Eff2
8. Do you use scientific information in your work in relation to LPA assessment and certification strategies?	<ul style="list-style-type: none"> <li>How has it influenced or contributed to your work?</li> <li>Where did you get that information? (Any specific events, publication, meetings, etc.)</li> <li>What are the main barriers to using scientific information?</li> </ul>	<b>Understanding what the role of science is in decision-making.</b> Getting a better picture of the ways in which scientific knowledge is used by organizations, how they get the science they use, and what prevents them from basing their decision-making on scientific research findings. QAF: Rel7, Eff2, Eff3
9. Which factors are influence your (personal and/or organization) decision-making around issues related to LPA assessment and certification strategies?	<div> <ul style="list-style-type: none"> <li>Political factors</li> <li>Individual or organizational advocates</li> <li>Scientific information/ research</li> </ul> </div> <div> <ul style="list-style-type: none"> <li>Political factors</li> <li>Public opinion</li> <li>Precedent in other jurisdictions</li> <li>Global pressures/ influences</li> </ul> </div> <p>Are there any additional factors?</p>	<b>Understanding what other aspects influence decision-making.</b> Understanding how people see decision-making situations, which aspects matter most in making changes in policy & practice, and how research findings matter in relation to other factors.

**C) Determine respondent's awareness of and/or involvement in the principal investigator's project**

Main Question	Probes	Intent: What we are trying to find out <b>Do NOT ask these directly.</b>
10. Have you heard about [the principal investigator]'s research on LPA assessment and certification strategies?  *if they do not recognize the PI's name, prompt with details about the project	<div>[to non-partners]</div> <ul style="list-style-type: none"> <li>What do you know about the research project?</li> <li>How did you hear about it?</li> <li>How would you describe your interactions with the project or the principal investigator? (e.g., presentations, workshops, etc.)</li> </ul> <div>[to partners]</div> <ul style="list-style-type: none"> <li>How did you get involved in the project?</li> <li>What was your role in the project?</li> <li>What was your contribution to the project? (e.g., meetings, provide information, connect people, make recommendations, etc.)</li> <li>Do you think that your input was taken into account?</li> </ul>	<b>Understanding awareness, role, &amp; length of engagement with relevant actors and/or project partners.</b> Finding out informant's awareness & opinions about the project. Finding out to what extent the degree & length of engagement in the project may be associated with changes in policy & practice. QAF: Rel3, Rel7, Cre7, Cre8, Leg1, Leg2, Leg3, Leg4, Eff2

[Ask 11 ONLY to participants & those who said they know the principal investigator and the project]



11. How would you describe your participation/collaboration experience in the project?	<ul style="list-style-type: none"> <li>How would you characterize your opportunity to participate and engage in the research? (i.e., rigid/ restricted by student, open/facilitated by the PI/ participatory)</li> <li>Do you have any suggestions regarding how engagement/participation could have been made more meaningful for you?</li> <li>Do you think any key stakeholders were excluded from the research?</li> <li>Any examples of positive experiences/what was done well? Any promising practices?</li> <li>How could the participation/collaboration work even better in the future?</li> </ul>	<p><b>Understanding personal experience and feedback.</b></p> <p>Further details of the influence of the project on the personal level, possible additional aspects (re: knowledge translation). Potential for improvement. QAF: Leg2, Leg3</p>
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D) Perceptions on design and implementation elements and how the programming at Royal Roads University supports student success (ask only to members of the research advisory committee)

Main Question	Probes	Intent: What we are trying to find out <b>Do NOT ask these directly.</b>
12. How do you think the Master of Arts in Leadership program helps to support effective student research?	<ul style="list-style-type: none"> <li>How is research taught in the program?</li> <li>How is the applied research focus reflected in the program?</li> <li>How do you think [the principal investigator]'s project was influenced by the program (positively, negatively)?</li> </ul>	<p><b>Understanding program influence on effective research practice.</b></p> <p>QAF: Cre1, Cre5, Cre6, Cre8</p>
13. How was [the principal investigator]'s project assessed?	<ul style="list-style-type: none"> <li>What criteria were used?</li> <li>What would you say are some of the challenges of assessing research of this kind?</li> </ul>	<p><b>Understanding how student research is assessed, and how advisory committee members conceptualizes research effectiveness.</b></p>
14. How would you characterize the design and implementation of [the principal investigator]'s project?	<ul style="list-style-type: none"> <li>Did [the principal investigator] demonstrate a comprehensive understanding of the context and elements relevant to the research problem?</li> <li>How would you describe the application of the methods?</li> <li>Was the execution suitable to the research objectives?</li> <li>Was the execution suitable to the context?</li> <li>Do you think resources were sufficiently and effectively allocated?</li> <li>Were there any issues with the design that you can recall? How were these addressed?</li> <li>Do you think any important stakeholders were excluded?</li> </ul>	<p><b>Perspectives about project design and implementation.</b></p> <p>QAF: Rel3, Rel5, Rel6, Cre1, Cre4, Cre7, Cre8</p>

E) Research outcomes assessment (ask only if they are aware of the project) (purpose to determine extent of outcome achievement and research influence on knowledge or social process contributions around LPA assessment and certification strategies)

Main Question	Probes	Intent: What we are trying to find out <b>Do NOT ask these directly.</b>
15. What contributions do you think [the principal investigator]'s project has made to address issues pertaining to LPA assessment and certification strategies?	<ul style="list-style-type: none"> <li>• Changes in knowledge/understanding?</li> <li>• Changes in attitudes?</li> <li>• Changes in skills?</li> <li>• Changes in relationships?</li> <li>• Changes in behaviour?</li> <li>• At what level do these changes mostly occur? (i.e., organizational, individual, governmental, policy, practice)</li> <li>• When did these changes occur? (during, post-project)</li> <li>• What are the implications of these changes?</li> <li>• Were there any negative outcomes of this project? If yes, please describe.</li> <li>• Probe for specific outcomes the principal investigator thought the informant could speak to.</li> <li>• What do you think the principal investigator did well to achieve these results?</li> <li>• How accessible did you find the results and communication during the process?</li> <li>• Do you think the research can be transferred to other contexts?</li> </ul>	<p><b>Understanding the respondent's opinion about the contributions of the research.</b></p> <p>Finding out the respondent's opinion on the student's research contributions (without leading to specific outcomes). Can give an indication of the utility of the research.</p> <p>Finding out how the student's research is/was perceived and conceptualized by interviewees to get an overall characterization of the change process. This will help us construct narratives about alternative and/or supplementary theories of change.</p> <p>Finding out about the explicit outcomes/impacts of the project in question <b>anywhere</b> (in the world) of which the informant is aware, not just within their own work/organization.</p> <p>QAF: Rel6, Rel7, Cre7, Cre8, Cre10, Leg3, Eff1, Eff2, Eff3, Eff4</p>
16. Has the research contributed to or influenced your work on the topic?	<ul style="list-style-type: none"> <li>• What were the most important things you learned?</li> <li>• Have there been any positive or negative impacts on knowledge, awareness, policy, capacity, or practice?</li> <li>• In what ways? [ask for examples]</li> <li>• [If respondent mentions knowledge, ask about what knowledge product it came from]</li> </ul>	<p><b>Understanding how the student's research has influenced their work (re: the topic of focus).</b></p> <p>Finding out about linkages between project and informant's work on the topic of focus*, and whether the research has contributed to changes in policy &amp; practice, the debate, awareness in the topic, knowledge, capacity, or any other type of contributions. Getting a sense whether the change is perceived as positive or negative.</p> <p>QAF: Rel5, Eff1, Eff2, Eff3, Eff4</p>
17. If there was more time and resources available, what do you think [the principal investigator] could have done differently to produce more useful findings and/or change?	<ul style="list-style-type: none"> <li>• Why do you think these would be useful? [ask for examples]</li> <li>• How do you think [the principal investigator] could have integrated these into their project?</li> <li>• Why do you think this [suggestion] was not done?</li> <li>• Do you think resources were efficiently and appropriately allocated?</li> </ul>	<p><b>Understanding alternative ToCs and perspectives of the research potential beyond what it did achieve/intended to, and other opportunities.</b></p> <p>Hold to the end of the interview – if the interviewee starts talking about it at the beginning, please lead them back to any of the questions above and ask to return to the question.</p> <p>This Q allows participants to give feedback to the project and helps identify gaps/challenges, but we know many of the problems</p>

		<p>already and do not want to let this dominate/ mislead the main focus of the interview.</p> <p>Use this opportunity to increase the depth of any previous answers by probing and relating this question to any other points informants raise – if/when appropriate.</p> <p>QAF: Rel3, Rel5, Rel5, Rel7, Cre1, Leg3</p>
18. What would have happened in the topic of LPA assessment and certification strategies if this research had not been conducted?	<ul style="list-style-type: none"> <li>Probe to clarify if needed (the role of the project in improving collaboration, social networks, participation, engagement, etc.)</li> </ul>	<p><b>Testing “zero hypothesis”.</b></p> <p>Using a different angle to understand the true influence of the project by asking what would be different had the PI not done this work.</p> <p>QAF: Eff4</p>

#### F) Closing Questions

Main Question	Probes	Intent: What we are trying to find out <b>Do NOT ask these directly.</b>
19. What does effective research mean to you?	<ul style="list-style-type: none"> <li>What does effective research look like?</li> </ul>	<b>Understanding opinions on research effectiveness.</b>
20. Do you have any additional remarks with regard to the role of [the principal investigator]’s project, or research in general, in change processes?	<ul style="list-style-type: none"> <li>Is there anything else you would like to add that has not been discussed that will be useful for our evaluation?</li> </ul>	<p><b>Closing</b></p> <p>Last remarks, things they might want to add that were not addressed, and closure.</p>

## Appendix 3. Codebooks

### Outcomes Codebook

Code	Description	Comment
Alternative explanation(s)	Factors, actors, or processes external to the project that contributed to outcome achievement.	Aligned with questions from interview guide on other developments, factors, and challenges.
Application	Any reference to possible practical applications resulting from the research (or any other related research in the region/topic). Include comments of whether participants have used or applied knowledge from the project (or another project/training) in their work, and how it changed practices. Include any indication of future intentions to apply or use knowledge in academic, policy, or practice contexts.	• Evaluation Research Question 2d: To what extent and how are target audiences aware of and using the project outputs?
Barriers	Comments related to factors that obstructed the research process and its contributions.	• Evaluation Research Question 2f: What lessons about effective research practice can be learned from this case study?
Changes in attitude	Evidence of changes in attitudes.	• Evaluation Research Question 1a: To what extent and how were the intended outcomes realized?
Changes in behaviour	Evidence of changes in behaviour.	• Evaluation Research Question 1a: To what extent and how were the intended outcomes realized?
Changes in knowledge	Evidence of changes in knowledge.	• Evaluation Research Question 1a: To what extent and how were the intended outcomes realized?
Changes in relationships	Evidence of changes in relationships.	• Evaluation Research Question 1a: To what extent and how were the intended outcomes realized?
Changes in skills	Evidence of changes in skills.	• Evaluation Research Question 1a: To what extent and how were the intended outcomes realized?
Characteristics of project design & implementation	Comments relating to perceptions of the design and implementation of the project.	• Evaluation Research Question 2a: What elements of project design and implementation supported outcome realization, and how?
Characteristics of researcher	Comments relating to perceptions of the PI, how they conducted themselves, their personality, and their soft skills, etc.	
Decision-making	Any data pertaining to decision-making done during the project, or influences on stakeholder decision-making.	Aligns with questions in the interview guide pertaining to decision-making and knowledge.
Dissemination & knowledge sharing	Information on how, where, and with whom the research was shared (planned or unexpected opportunities).	Code aspects of ‘knowledge translation’ and ‘brokering’. • Evaluation Research Question 2a: What elements of project design and implementation supported outcome realization, and how? • Evaluation Research Question 2d: To what extent and how are target audiences aware of and using the project outputs?
Facilitating factors	Comments related to factors that facilitated/supported the research process and its contributions.	• Evaluation Research Question 2f: What lessons about effective research practice can be learned from this case study?

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Knowledge sources	Comments of where people get their knowledge and how they use it in their work. Comments of what type of knowledge/research people perceive to be credible or useful.	• Evaluation Research Question 2d: To what extent and how are target audiences aware of and using the project outputs?
Perceptions on research effectiveness	Informants' ideas on what constitutes effective research. Discussion of effective research qualities.	• Evaluation Research Question 2f: What lessons about effective research practice can be learned from this case study?
Power	Any aspects related with power and power dynamics.	
Relevant actors	Identification and information pertaining to actors relevant to the context, whether they be direct participants in the research, actors within the context, actors working on issues/topics within the context/system, or boundary partners.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
RRU-related information	Any comments related to RRU, its programs, pedagogy, decisions to attend, benefits gained, critiques, etc.	• Evaluation Research Question 2e: How does RRU support student success in research? • Evaluation Research Question 2f: What lessons about effective research practice can be learned from this case study?
Social networks	Any reference to networks and connections between people or organizations that go beyond knowing about the other's existence.	
Trust	Comments related to relationships and trust. Also trust of researcher, findings, organizations, or other actors in the system.	
Unexpected outcomes	Comments of other changes in knowledge, attitudes, skills, relationships, and/or behaviour resulting fully or in part from the research that were not identified by the PI.	• Evaluation Research Question 1b: Were there any positive or negative unexpected outcomes from this project?
Zero hypothesis	A different angle to understand the true influence of the research by asking what would be different had the student not done their research.	• Evaluation Research Question 1c: Could the outcomes have been realized in the absence of the project?
<b>Case-specific Outcomes</b> Outcomes were identified in the ToC workshop and are reflected in the ToC model.		
Participants gain knowledge of adult learning	Intermediate outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?
Participants recognize training and assessment gaps	Intermediate outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?
Participants recognize importance and contribution of the LPA role	Intermediate outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?
CATSA recognizes value of LPA training certification	Intermediate outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?
PI's professional development is enhanced by research experiences	Intermediate outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?
LPAs pursue continuous learning	End-of-project outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?

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CATSA management decision-making is influenced (principles of continuous learning, trainers' standards)	End-of-project outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?
Research methods adopted into organizational practice (unexpected)	End-of-project outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?
PI continues using methods learned at RRU (e.g., appreciative inquiry, action research, and experiential learning)	End-of-project outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?
PI pursues continuous learning and training to apply in practice to set people up for success	End-of-project outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized?
CATSA pilot participants (LPAs) gain knowledge of adult learning	High-level outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized? • Evaluation Research Question 1e: Are the higher-level changes likely to be realized?
LPAs acquire CTPs/CTDPs	High-level outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized? • Evaluation Research Question 1e: Are the higher-level changes likely to be realized?
LPAs have improved confidence and professional capacity	High-level outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized? • Evaluation Research Question 1e: Are the higher-level changes likely to be realized?
LPA role becomes more integrated on training and assessment	High-level outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized? • Evaluation Research Question 1e: Are the higher-level changes likely to be realized?
LPA role evolves to focus on the training of trainers	High-level outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized? • Evaluation Research Question 1e: Are the higher-level changes likely to be realized?
CATSA recognizes recurrent learning requirements, values continuous learning, and upholds in practice	High-level outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized? • Evaluation Research Question 1e: Are the higher-level changes likely to be realized?
CATSA develops LPA certification program	High-level outcome.	• Evaluation Research Question 1a: To what extent and how were outcomes realized? • Evaluation Research Question 1e: Are the higher-level changes likely to be realized?

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CATSA pilots LPA certification program	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>
CATSA increases consistency and effectiveness of training delivery and assessment (tools/documentation created)	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>
CATSA values adult learning and certification (awarding of skill set, LPA skills set, lists CTP certification as an asset)	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>
Service contractors do their own training (install standards for trainer competencies) (unexpected)	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>
Screeners are more consistent and improve their screening practices	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>
Operations department recognizes performance and learning contributions to screening effectiveness (unexpected)	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>
CATSA develops a national certification training program for service contractors (unexpected)	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>
Service contract trainers are better positioned to be hired as LPAs and training for transition is shorter (unexpected)	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>
PI continues in performance management at CATSA	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>
Performance across CATSA departments becomes more integrated and systematic	High-level outcome.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?</li> </ul>

## QAF Codebook

Code	Description	Comment
Alternative explanations are explored	An indicator for the ‘Clearly presented argument’ criterion. Part of the Credibility Principle.	• Evaluation Research Question 1c: Could the outcomes have been realized in the absence of the project?
Analyses and interpretations are adequately explained (clearly described terminology and logic leading to conclusions)	An indicator for the ‘Clearly presented argument’ criterion. Part of the Credibility Principle.	
Any changes to research project as a result of reflection are described and justified	An indicator for the ‘Ongoing monitoring and reflexivity’ criterion. Part of the Credibility Principle.	
Approach is justified in reference to the context	An indicator for the ‘Research approach fits purpose’ criterion. Part of the Credibility Principle.	
Bias is identified (researchers’ positions, sources of support, financing, collaborations, partnerships, research mandate, assumptions, goals and bounds placed on commissioned research	An indicator for the ‘Disclosure of perspective’ criterion. Part of the Legitimacy Principle.	
Biases and limitations are recognized	An indicator for the ‘Adequate competencies’ criterion. Part of the Credibility Principle.	
Collaboration process is discussed	An indicator for the ‘Effective collaboration’ criterion. Part of the Legitimacy Principle.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
Considering full range of stakeholders explicitly identifies ethical challenges and how they were resolved	An indicator for the ‘Research is ethical’ criterion. Part of the Legitimacy Principle.	
Context is analyzed sufficiently to identify research entry points	An indicator for the ‘Clearly defined socio-ecological context’ criterion. Part of the Relevance Principle.	
Context is defined and described	An indicator for the ‘Clearly defined socio-ecological context’ criterion. Part of the Relevance Principle.	
Demonstration that opportunities and process for collaboration are appropriate to the context and actors involved (e.g. clear and explicit roles and responsibilities agreed upon, transparent and appropriate decision-making structures)	An indicator for the ‘Effective collaboration’ criterion. Part of the Legitimacy Principle.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
Ethical review process followed is described	An indicator for the ‘Research is ethical’ criterion. Part of the Legitimacy Principle.	
Evidence is provided that necessary skills, knowledge and expertise are represented in the research team in the right measure to address the problem	An indicator for the ‘Adequate competencies’ criterion. Part of the Credibility Principle.	
Evidence of changes in behavior among participants or stakeholders	An indicator for the ‘Research builds social capacity’ criterion. Part of the Positioning for Use Principle.	• Evaluation Research Question 1a: To what extent and how were outcomes achieved?



Evidence of changes in knowledge and understanding among participants (stakeholders)	An indicator for the 'Research builds social capacity' criterion. Part of the Positioning for Use Principle.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 2d: To what extent and how are target audiences aware of and using the project outputs?</li> </ul>
Evidence of changes of perspectives among participants or stakeholders	An indicator for the 'Research builds social capacity' criterion. Part of the Positioning for Use Principle.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 2d: To what extent and how are target audiences aware of and using the project outputs?</li> </ul>
Evidence that innovations developed through the research or the research process have been (or will be applied) in the real world	An indicator for the 'Practical application' criterion. Part of the Positioning for Use Principle.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 2d: To what extent and how are target audiences aware of and using the project outputs?</li> </ul>
Evidence that knowledge generated by the research has contributed understanding of the research topic and related issues among target audiences	An indicator for the 'Contribution to knowledge' criterion. Part of the Positioning for Use Principle.	<ul style="list-style-type: none"> <li>• Evaluation Research Question 1a: To what extent and how were outcomes realized?</li> <li>• Evaluation Research Question 2d: To what extent and how are target audiences aware of and using the project outputs?</li> </ul>
Evidence that the research has contributed to positive change in the problem context or innovations that have positive social or environmental impacts	An indicator for the 'Significant outcome' criterion. Part of the Positioning for Use Principle.	• Evaluation Research Question 1e: Are the higher-level outcomes likely to be realized?
Explains roles and contributions of all participants in the research process	An indicator for the 'Genuine and explicit inclusion' criterion. Part of the Legitimacy Principle.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
Integration of an appropriate breadth and depth of literature and theory from across disciplines relevant to the context and the context itself	An indicator for the 'Broad preparation' criterion. Part of the Credibility Principle.	
Knowledge skills and expertise needed to carry out research are identified	An indicator for the 'Adequate competencies' criterion. Part of the Credibility Principle.	
Limitations are accounted for on an ongoing basis	An indicator for the 'Limitations stated' criterion. Part of the Credibility Principle.	
Limitations are stated	An indicator for the 'Limitations stated' criterion. Part of the Credibility Principle.	
Methods are clearly described	An indicator for the 'Appropriate methods' criterion. Part of the Credibility Principle.	
Methods are fit to purpose	An indicator for the 'Appropriate methods' criterion. Part of the Credibility Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?

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Methods are systematic yet adaptable	An indicator for the 'Appropriate methods' criterion. Part of the Credibility Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?
Methods are transparent	An indicator for the 'Appropriate methods' criterion. Part of the Credibility Principle.	
Novel methods or adaptations are justified and explained (including why they were used and how they maintain scientific rigour)	An indicator for the 'Appropriate methods' criterion. Part of the Credibility Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?
Objectives are achieved	An indicator for the 'Objectives stated and met' criterion. Part of the Credibility Principle.	• Evaluation Research Question 2c: To what extent were the research findings sufficiently relevant to achieve the stated objectives?
Objectives clearly stated	An indicator for the 'Objectives stated and met' criterion. Part of the Credibility Principle.	
Objectives logically and appropriately related to the context	An indicator for the 'Objectives stated and met' criterion. Part of the Credibility Principle.	
Problem defined to show relevance to the context	An indicator for the 'Socially relevant research problem' criterion. Part of the Relevance Principle.	
Process of integration (including how paradoxes and conflicts were managed) is discussed	An indicator for the 'Research approach fits purpose' criterion. Part of the Credibility Principle.	
Processes of reflection (individually and as a research team) are clearly documented throughout the process	An indicator for the 'Ongoing monitoring and reflexivity' criterion. Part of the Credibility Principle.	
Rationale for inclusion and integration of different epistemologies, disciplines, methodologies is explicitly stated	An indicator for the 'Research approach fits purpose' criterion. Part of the Credibility Principle.	
Research articulates what the achievement of the outcomes implies for higher level impacts	An indicator for the 'Explicit Theory of Change' criterion. Part of the Relevance Principle.	• Evaluation Research Question 1e: Are the higher-level changes likely to be realized?
Research design and resources are appropriate and sufficient to meet the objectives	An indicator for the 'Feasible research project' criterion. Part of the Credibility Principle.	
Research design and resources are sufficiently resilient to adapt to unexpected opportunities and challenges throughout the research process	An indicator for the 'Feasible research project' criterion. Part of the Credibility Principle.	
Research execution is suitable to objectives	An indicator for the 'Appropriate project implementation' criterion. Part of the Relevance Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?
Research execution is suitable to the problem context	An indicator for the 'Appropriate project implementation' criterion. Part of the Relevance Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?
Research explicitly identifies how the outcomes are intended and expected to be realized	An indicator for the 'Explicit Theory of Change' criterion. Part of the Relevance Principle.	

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Research explicitly identifies its main intended outcomes	An indicator for the 'Explicit Theory of Change' criterion. Part of the Relevance Principle.	
Research identified necessary actors	An indicator for the 'Effective Communication' criterion. Part of the Relevance Principle.	
Research problem is clearly stated and defined	An indicator for the 'Clear research problem definition' criterion. Part of the Credibility Principle.	
Research problem is grounded in the academic literature and problem context	An indicator for the 'Clear research problem definition' criterion. Part of the Credibility Principle.	
Research problem is researchable	An indicator for the 'Clear research problem definition' criterion. Part of the Credibility Principle.	
Research project communicated with all necessary actors	An indicator for the 'Effective Communication' criterion. Part of the Relevance Principle.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
Research project planned appropriate communications	An indicator for the 'Effective Communication' criterion. Part of the Relevance Principle.	
Research question is clearly stated and defined	An indicator for the 'Clear research question' criterion. Part of the Credibility Principle.	
Research question is grounded in the academic literature and problem context	An indicator for the 'Clear research question' criterion. Part of the Credibility Principle.	
Research question is justified	An indicator for the 'Clear research question' criterion. Part of the Credibility Principle.	
Researcher interacted sufficiently with problem context	An indicator for the 'Engagement with the problem context' criterion. Part of the Relevance Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?
Researcher(s) interacted appropriately with problem context	An indicator for the 'Engagement with the problem context' criterion. Part of the Relevance Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?
Researcher(s) is well positioned to influence change process	An indicator for the 'Engagement with the problem context' criterion. Part of the Relevance Principle.	
Results are clearly presented	An indicator for the 'Clearly presented argument' criterion. Part of the Credibility Principle.	
Stakeholders are engaged appropriately throughout the process	An indicator for the 'Appropriate project implementation' criterion. Part of the Relevance Principle.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
Statement about the practical application of research activities	An indicator for the 'Socially relevant research problem' criterion. Part of the Relevance Principle.	
Statement about the practical application of research outcomes	An indicator for the 'Socially relevant research problem' criterion. Part of the Relevance Principle.	

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Steps taken to ensure respectful inclusion of diverse actors and views are explicit	An indicator for the ‘Genuine and explicit inclusion’ criterion. Part of the Legitimacy Principle.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
The documentation explains the range of participants (cultural backgrounds and perspectives)	An indicator for the ‘Genuine and explicit inclusion’ criterion. Part of the Legitimacy Principle.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
The research achieved appropriate communications	An indicator for the ‘Effective Communication’ criterion. Part of the Relevance Principle.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
The research design considers stakeholder needs and values	An indicator for the ‘Relevant research objectives and design’ criterion. Part of the Relevance Principle.	• Evaluation Research Question 2b: To what extent and how did the project engage effectively with relevant stakeholders?
The research design is appropriate to the problem context	An indicator for the ‘Relevant research objectives and design’ criterion. Part of the Relevance Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?
The research design is relevant	An indicator for the ‘Relevant research objectives and design’ criterion. Part of the Relevance Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?
The research design is timely	An indicator for the ‘Relevant research objectives and design’ criterion. Part of the Relevance Principle.	• Evaluation Research Question 2a: What elements of the research design and implementation supported outcome realization, and how?
The research objectives are appropriate to the problem context	An indicator for the ‘Relevant research objectives and design’ criterion. Part of the Relevance Principle.	
The research objectives are relevant	An indicator for the ‘Relevant research objectives and design’ criterion. Part of the Relevance Principle.	
The research objectives consider stakeholder needs and values	An indicator for the ‘Relevant research objectives and design’ criterion. Part of the Relevance Principle.	
Transferability of research findings is explained	An indicator for the ‘Transferability and generalizability of research findings’ criterion. Part of the Credibility Principle.	• Evaluation Research Question 2d: To what extent and how are target audiences aware of and using the project outputs?
Transferability of research process is explained	An indicator for the ‘Transferability and generalizability of research findings’ criterion. Part of the Credibility Principle.	• Evaluation Research Question 2d: To what extent and how are target audiences aware of and using the project outputs? How are they using them?
Understanding an appropriate breadth and depth of literature and theory from across disciplines of the context	An indicator for the ‘Broad preparation’ criterion. Part of the Credibility Principle.	
Understanding an appropriate breadth and depth of literature and theory from across disciplines relevant to the context	An indicator for the ‘Broad preparation’ criterion. Part of the Credibility Principle.	

## Appendix 4. Transdisciplinary Research Quality Assessment Framework (adapted from Belcher et al., 2016)

**Relevance:** The importance, significance, and usefulness of the research problem(s), objectives, processes, and findings to the problem context.

Criteria	Definition	Guidance
Clearly defined problem context <sup>4</sup>	The context is well defined, described, and analyzed sufficiently to identify a research problem and corresponding entry points.	<ul style="list-style-type: none"> <li>• The researcher(s) demonstrates holistic understanding of the problem context in which the research is situated (description of the system, including actors situated in the context)</li> <li>• Connection is made between the problem context and the research problem</li> <li>• Research entry points are determined by the problem context</li> </ul>
Socially relevant research problem <sup>5</sup>	The research problem is well defined and described, and considers the application to the problem context and current academic discourse.	<ul style="list-style-type: none"> <li>• The research problem is a timely issue in society or aligns with current actions (e.g., international commitments, governmental mandate, policy development, etc.)</li> <li>• There is a demand from system actors<sup>6</sup> for the research problem to be addressed</li> </ul>
Engagement with problem context	Researchers demonstrate appropriate <sup>7</sup> breadth and depth of understanding of and sufficient interaction with the problem context.	<ul style="list-style-type: none"> <li>• Understanding drawn from the literature</li> <li>• System actor perspectives are understood</li> <li>• Where possible, researchers incorporate insights from prior research or professional experiences relevant to the problem context</li> </ul>
Explicit theory of change	The research explicitly identifies its main intended outcomes <sup>8</sup> , how they are expected to be realized, and how they are expected to contribute to longer term outcomes and impacts.	<ul style="list-style-type: none"> <li>• The logic of the research contributions to a process of change is well described and sound</li> <li>• Key actors, processes, and assumptions are identified</li> <li>• End-of-project outcomes are reasonable to expect with the resources available</li> </ul>
Relevant research objectives and design	The research objectives are appropriate to the research problem, and the research design is aligned with the objectives.	<ul style="list-style-type: none"> <li>• Objectives identify what the research project aims to do or produce</li> <li>• Objectives can be justified in how they address the research problem (e.g., fill a knowledge gap)</li> <li>• The research design logically plans how the project will meet the objectives (i.e., identify what methods, activities, and engagement are needed)</li> </ul>

<sup>4</sup> **Problem context** refers to the social and environmental setting(s) that gives rise to the research problem, including aspects of: location; culture; scale in time and space; social, political, economic, and ecological/environmental conditions; resources and societal capacity available; uncertainty, complexity, and novelty associated with the societal problem; and the system actors and processes are discussed (Carew & Wickson, 2010).

<sup>5</sup> A **research problem** is the particular topic, area of concern, question to be addressed, challenge, opportunity, or focus of the research activity. Research problems highlight a gap in understanding or knowledge that contributes to the social problem.

<sup>6</sup> **System actors** include policy actors, NGOs, and intended beneficiaries

<sup>7</sup> Words such as ‘**appropriate**’, ‘**suitable**’, and ‘**adequate**’ are used deliberately to allow for quality criteria to be flexible and specific enough to the needs of individual research projects (Oberg, 2008).

<sup>8</sup> Outcomes are defined as “changes in knowledge, attitudes, skills, and relationships manifested as changes in behavior” (Belcher, Davel, & Claus, 2020, p.9).

Relevant communication <sup>9</sup>	Communication during and after the research process <sup>10</sup> is appropriate to the context and accessible to stakeholders, users, and other intended audiences.	<ul style="list-style-type: none"> <li>• Communications with system actors help focus the research, source information, and co-generate and share learning</li> <li>• Communications are timely and responsive to other system processes</li> <li>• Communications are tailored to the target audience</li> </ul>
<b>Credibility:</b> The research findings are robust and the sources of knowledge are dependable. This includes clear demonstration of the adequacy of the data and the methods used to procure the data, including clearly presented and logical interpretation of findings.		
Criteria	Definition	Guidance
Broad preparation	The research is based on a strong integrated theoretical and empirical foundation.	<ul style="list-style-type: none"> <li>• Breadth and depth of literature and theory from relevant disciplines are reviewed and integrated</li> <li>• Empirical demonstration of gaps is based on previous research or interventions, or identified by system actors (e.g., joint problem formulation)</li> </ul>
Clear research problem definition	The research problem is clearly stated and defined, researchable, and grounded in the academic literature and problem context.	<ul style="list-style-type: none"> <li>• A research/knowledge gap is identified</li> <li>• The importance of and need for the research is demonstrated</li> <li>• The research problem can be answered empirically</li> </ul>
Clear research question	The research question(s) is clearly stated and defined, researchable, and justified as an appropriate way to address the research problem.	<ul style="list-style-type: none"> <li>• The research question(s) is logically derived from the research problem</li> <li>• The research question(s) can be answered empirically (i.e., is researchable)</li> <li>• Justification is given on how answering the research question will address the research problem</li> </ul>
Objectives stated and met	Research objectives <sup>11</sup> are clearly stated and sufficient to answer the research question(s).	<ul style="list-style-type: none"> <li>• Objectives are clear, coherent, and feasible</li> <li>• Objectives indicate what knowledge is needed, and how that knowledge will be acquired</li> <li>• Collectively, satisfying all objectives will answer the research question(s)</li> </ul>
Feasible research project	The research design and resources are appropriate and sufficient to meet the objectives as stated, and adequately resilient to adapt to unexpected opportunities and challenges throughout the research process.	<ul style="list-style-type: none"> <li>• Research design is logically derived from the objectives</li> <li>• The project can be completed with the resources available (i.e., budget, time, hardware, software, human capital, and social capital)</li> <li>• Research design is flexible to accommodate unexpected changes</li> </ul>

<sup>9</sup> **Communication** refers to both written communication (e.g., proposal, documents, presentation of findings, etc.) as well as engagement communications (e.g., scoping, data collection activities, meetings, workshops, etc.).

<sup>10</sup> **Research process** refers to the series of decisions made and actions taken throughout the entire duration of the research project and encompasses all aspects of the research project.

<sup>11</sup> **Objectives** explain what the research will do (i.e., generate specific knowledge, create or facilitate specific processes) and what steps will be undertaken in order to answer the research question(s).

Adequate competencies	The skills and competencies of the researcher(s), team, or collaboration (including academic and societal actors) are sufficient and in appropriate balance (without unnecessary complexity) to succeed.	<ul style="list-style-type: none"> <li>• The knowledge, skills, and expertise needed to carry out the research are identified</li> <li>• The necessary knowledge, skills, and expertise are represented in the research team</li> </ul>
Appropriate research framework	Disciplines, perspectives, epistemologies, approaches, and theories are combined and/or integrated to meet stated objectives and answer the research question(s).	<ul style="list-style-type: none"> <li>• Explanation of the theoretical framework is given</li> <li>• Explanation is provided for why and how disciplines, epistemologies, and theories are used</li> <li>• The process of integration of disciplines, epistemologies, and theories is explained, including how paradoxes and conflicts between integrated components are addressed</li> <li>• Justification is given for the framework selected in relation to the problem context</li> </ul>
Appropriate methods	Methods are fit to purpose and well suited to achieving the objectives and answering the research question(s).	<ul style="list-style-type: none"> <li>• Clear descriptions of methods and how they were applied are given</li> <li>• Selection of methods are justified and logically connected to the objectives</li> <li>• Novel (unproven) methods or adaptations are explained and justified, including why they were used and how they maintain rigour</li> </ul>
Sound argument	The logic from analysis through interpretation to conclusions is clearly described. Sufficient evidence is provided to clearly demonstrate the relationship between evidence and conclusions.	<ul style="list-style-type: none"> <li>• The argument is logical and defensible</li> <li>• Analyses and interpretations are adequately explained and supported by evidence</li> <li>• If applicable, alternative explanations of results are explored</li> </ul>
Transferability and/or generalizability of research findings	The degree to which the research findings are applicable in other contexts is assessed and discussed. In cases that are too context-specific to be generalizable, aspects of the research process or findings that may be transferable to other contexts and/or used as learning cases are discussed.	<ul style="list-style-type: none"> <li>• Researcher(s) discusses the ability to transfer results and/or methods to other contexts</li> <li>• Justification of transferability/generalizability of results is logical</li> </ul>
Limitations stated	An explanation of how the characteristics of the research design or method may have influence on the results or conclusions is given.	<ul style="list-style-type: none"> <li>• The influence of internal (e.g., sampling) and/or external factors (e.g., responsiveness of interviewees) on the results is acknowledged and discussed</li> <li>• Researcher(s) assess the extent to which the limitations influence the results</li> </ul>
Ongoing monitoring and reflexivity <sup>12</sup>	Researchers engage in ongoing reflection and adaptation of the research process, making changes as new obstacles, opportunities, circumstances, and/or knowledge surface.	<ul style="list-style-type: none"> <li>• There is an indication that the researcher(s) considers the need to reflect on and adapt during the research process</li> <li>• Efforts to monitor progress and identify, consider, and respond to changes in context or understanding are discussed</li> <li>• Processes of reflection (whether formal or informal), and the resulting action(s) taken, are explained</li> </ul>

<sup>12</sup> **Reflexivity** refers to an iterative process of formative, critical reflection on the important interactions and relationships between a research project's process, context, and product(s).

**Legitimacy:** The research process is perceived as fair and ethical. This encompasses the ethical and fair representation of all involved and the appropriate and genuine inclusion and consideration of diverse participants, values, interests, and perspectives.

Criteria	Definition	Guidance
Disclosure of perspective	Actual, perceived, and potential bias is clearly stated and accounted for.	<ul style="list-style-type: none"> <li>• Potential for actual or perceived bias (e.g., positionality, sources of funding, partnerships, mandate, etc.) is identified and acknowledged</li> <li>• Implications of potential bias on the conclusions are discussed</li> </ul>
Effective collaboration <sup>13</sup>	Individuals <sup>14</sup> involved in the research process pool their knowledge, experience, and skills together in a constructive atmosphere and in appropriate measure to produce new knowledge and/or social processes that contribute to a common goal.	<ul style="list-style-type: none"> <li>• A shared understanding of goals and expectations is established</li> <li>• Roles and responsibilities are clear and explicitly agreed upon</li> <li>• Decision-making structures are transparent and fair</li> <li>• A synergistic process capitalizes on the strengths of collaborators (across disciplinary, professional, organizational, and cultural boundaries)</li> </ul>
Genuine and explicit inclusion <sup>15</sup>	The research offers authentic opportunities to involve relevant actors to share their perspectives, knowledge, and values, and/or participate in the research process.	<ul style="list-style-type: none"> <li>• Participants' roles and contributions, perspectives, and cultural backgrounds are described</li> <li>• Steps taken to ensure the respectful inclusion of diverse actors and views are explained</li> </ul>
Research is ethical	The research adheres to standards of ethical conduct.	<ul style="list-style-type: none"> <li>• Ethical practice is followed: research does no harm; participants have informed consent; anonymity and confidentiality are maintained</li> <li>• Procedural ethics (e.g., ethical review process) are pursued and documented</li> </ul>

**Positioning for Use:** The research process is designed and managed to enhance sharing, uptake, and use of research outputs and stimulates actions that address the problem and contribute to solutions.

Criteria	Definition	Guidance
Strategic engagement	Research process stimulates and/or engages with change opportunities.	<ul style="list-style-type: none"> <li>• Engagements are timely and responsive to other system processes</li> <li>• Researcher(s) is well positioned to have influence within the problem context</li> <li>• Opportunities to influence change processes are identified and/or generated, and acted upon</li> <li>• Resources are mobilized to influence/act on change processes</li> </ul>

<sup>13</sup> Collaboration encompasses both internal dynamics within the core research team and external processes with participants, collaborators, partners, and allies. Collaboration comes in many forms in research, ranging from general advice-giving to co-generated knowledge production.

<sup>14</sup> Within and external to the core research team.

<sup>15</sup> Some system actors may not want to participate in the research process, but still want their views to be represented in the findings. It is the task of the researcher(s) to ensure that their perspectives are accurately represented.



New knowledge contribution	Research generates new knowledge and understanding in academic and social realms in a timely, relevant, and significant way.	<ul style="list-style-type: none"> <li>• An academic knowledge gap is filled</li> <li>• System actors' knowledge gaps are filled</li> <li>• System actors gain a better understanding of the problem context</li> </ul>
Influencing attitudes	Research process and/or findings stimulates and supports system actors to reflect on and/or change their attitudes or perspectives on the problem and solutions to address it.	<ul style="list-style-type: none"> <li>• Awareness-building of the research problem, the research findings, or a solution/innovation is a first step in changing attitudes</li> <li>• System actors gain a different perspective on the targeted problem as a result of the research process and/or findings</li> </ul>
Capabilities	System actors develop skills relevant to the problem context and/or for solving the social problem through the research process and/or findings.	<ul style="list-style-type: none"> <li>• Research capacities of the researcher(s) and/or partners are developed (e.g., gain research experience, training, testing of new methods/approaches)</li> <li>• Participants and partners gain new or build on existing skills as a result of the research process and/or findings</li> <li>• Skills developed are transferable to other aspects of system actors' professional or personal lives</li> </ul>
Relationship-building	The research process supports new or fortifies existing relationships, networks, and ways of working for solution-building in the problem context.	<ul style="list-style-type: none"> <li>• Trust between system actors is fostered by the research process</li> <li>• Mutual interests between system actors are recognized</li> <li>• A forum, platform, or network is created or strengthened as a result of the research process</li> <li>• System actors work together in new ways as a result of the research process</li> <li>• The research contributes to shifting the power dynamics toward solution-building</li> <li>• Open communication, equality and equity, co-identification/co-development across the research process, feedback processes, and conflict management and resolution are important components of effective relationships</li> </ul>
Practical application	The findings, process, and/or products of research have high potential for use by system actors.	<ul style="list-style-type: none"> <li>• The potential utility of the research outputs for system actors are discussed</li> <li>• System actors convey intentions to use or apply the research</li> <li>• System actors pilot, adopt, or adapt a method, tool, approach, or innovation from the research</li> <li>• System actors use or refer to the research findings to inform their work</li> </ul>
Significant results	Research contributes to the solution of the targeted problem or provides unexpected solutions to other problems.	<ul style="list-style-type: none"> <li>• The research process and/or findings contribute to behaviour change in the problem context</li> <li>• Expected changes are realized or have potential to be realized in the future</li> </ul>

## Appendix 5. QAF Scores and Justifications

**Table 7.** Individual evaluator and average scores for all QAF criteria, with justifications for the score allocated

Principle	Criteria	E1	E2	E3	E4	Avg.	Justification/Comments
Relevance	Clearly defined problem context	2	2	2	2	2	Thesis provides overview of the aviation security, CATSA, and LPA problem contexts; clear connection is made between problem context and research problem; research entry points are drawn from problem context and PI's personal experience as a former LPA.
	Socially relevant research problem	2	2	2	2	2	The practical gaps of the research problem are relevant for CATSA as an organization and LPAs (need for systematic accreditation of LPA role); clear research gap (no prior research on specialized topic); research problem aligns with CATSA's organizational purpose, need to evolve/keep up with technology, the NTCP, and CATSA's recurrent learning and recertification program activities for other roles; research was aligned with the sponsor's professional objectives to create a LPA Certification Program; LPAs recognize value of research (gap was less apparent to those in leadership positions); demand from Calgary context.
	Engagement with problem context	2	2	2	2	2	PI interacted sufficiently with the problem context to gain a breadth and depth of understanding from the literature; literature review and interviews indicate various system actor perspectives (e.g., participants, LPAs, senior management, sponsors) and organizational culture are understood; PI incorporated insights from personal experience as former LPA and member of CATSA; engagement with advisory team ensured there was collective understanding of the problem context.
	Explicit theory of change	1	1	1	1	1	Not explicit or documented, but implicit in statements of intended changes of the research opportunity; the thesis would have been stronger with a fully articulated ToC; thesis indicates opportunities to influence changes within CATSA; intended beneficiaries of the research were identified; assumptions underlying expected changes were not explicit.
	Relevant research objectives and design	2	2	2	2	2	Research design is relevant and appropriate to the problem context and justifies how the methods and engagement activities will address the research problem; the action-oriented research approach involved LPAs as the actors under study in the development of a certification program for the LPA role.
	Relevant communication	2	2	2	2	2	PI successfully communicated with senior management for buy-in and sponsorship of the research; PI consulted with an advisory team for input to design (e.g., research questions, interview questions); informants reflected positively on the communication during the research process and dissemination of results across CATSA; presented findings and recommendations in a variety of formats.
Credibility	Broad preparation	2	2	2	2	2	Documentation conveys understanding from multiple topics and disciplines was drawn upon to help answer the research questions (e.g., competency assessment, organizational learning, adult learning); the literature review was used to prepare the PI to apply the concepts that would support the research inquiry.
	Clear research problem definition	2	2	2	2	2	Initial literature review identified clear gap in academia of aviation security certification; practical knowledge gaps identified; the thesis articulates the importance and need for the research; the research problem can be answered empirically.
	Clear research question(s)	1	1	2	1	1.25	The overarching and sub-research questions are stated in the thesis and can be answered empirically; research questions are logically derived; no explicit justification is given for how answering the research questions will address the research problem.

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	Comprehensive objectives	1	1	1	1	1	Research objectives are not described in the thesis (only noted in the appendices containing invitation letters to participate in the research activities); singular objective stated; a better formulation of objectives would have aided the structure and purpose of the project.
	Feasible research project	2	2	2	2	2	Research design is logically connected to answering the research questions; the design and resources were appropriate to carry out the research; PI had support from CATSA sponsors and others in their network to carry out the research; world café activities were built into relevant organizational activities (e.g., CATSA retreats) to support engagement (and in consideration of budget and time constraints); research design was flexible to accommodate changes.
	Adequate competencies	2	2	2	2	2	The PI had extensive prior field experience of the LPA role and knowledge of the CATSA context; documentation demonstrates the PI built sufficient knowledge and skills in the methods necessary to carry out the research to completion; the PI involved a transcriptionist, editor, sponsor, and advisory team in the research team to support the project; informants commented on the PI's passion for the work.
	Appropriate research framework	2	2	2	1	1.75	The thesis provides some justification for drawing on different disciplinary literature; explanation is provided for choice of methods to enable a collaborative action research approach and bring different perspectives together to develop a LPA competency assessment framework for the CATSA context; a stronger explanation of the selection of and integration of disciplinary literature and methods would have strengthened the research.
	Appropriate methods	2	2	2	2	2	The thesis clearly describes the methods and approach; rationale is given for use of the world café method to collect data from diverse participants and enable participant engagement with themes and data that came out of the interviews; greater depth and triangulation gathered from individual interviews; transparency is given in how the methods were applied and how results were derived.
	Sound argument	2	2	2	2	2	Clear and logical presentation of research process, findings, conclusions, recommendations, and organizational implications; analyses explain how data were used and conclusions were logically drawn.
	Transferability and generalizability of the findings	2	2	2	2	2	Explicit discussion is given to consider the results in context; the thesis acknowledges the limited transferability of the specific recommendations to other departments in CATSA as the findings are LPA-specific, though the potential for transferability of a user-informed comprehensive certification program development process to other contexts is briefly discussed; informants thought the findings on organizational learning and certification were transferable.
	Limitations stated	2	2	2	2	2	Limitations are briefly discussed in terms of demographics represented by the data (sampling), potential for researcher bias, and limited transferability of the findings; explanation is provided for how the selection and design of the world cafés were intended to ensure diverse inclusion of LPA perspectives and reduce researcher bias.
	Ongoing reflexivity and monitoring	1	2	1	2	1.5	The appreciative approach enabled reflection; processes of reflection and key aspects that were reflected upon (e.g., research approach, methods selection, world café question framing, researcher positionality, bias, etc.) are explained in the thesis, though concrete examples could have been discussed; consultations with the advisory team supported reflection; informants indicate the PI was critical and reflexive in the design and implementation of the project.
Legitimacy	Disclosure of perspective	2	2	2	2	2	Thesis discusses the PI's positionality as an employee of CATSA and their role as a manager; partnerships and sources of support were noted; thesis briefly acknowledges potential for bias, how the methods selected

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							intended to reduce researcher bias, and was cognizant of the potential implications for the findings (e.g., LPA certification should not necessarily mimic post-secondary courses and accreditation processes, but instead should be adapted for the needs and expectations of LPA audiences).
	Effective collaboration	2	2	2	2	2	PI received official support and sponsorship from CATSA to carry out the research with a shared understanding of goals and expectations; the PI collaborated with the sponsor, leadership, and the advisory team; members of the advisory committee reflected positively on their relationships with the PI; roles and responsibilities are clear and explicitly agreed upon; informants perceived the project to be collaborative and appreciated how they were brought on as collaborators to develop the LPA certification program.
	Genuine and explicit inclusion	2	2	2	2	2	A range of stakeholders across CATSA were represented by and involved in the research (e.g., 90 percent of LPAs, representations from across Canada); thesis details the efforts made to enable diverse perspectives to be shared; participants roles, perspectives, and contributions to the research process are clearly described.
	Research is ethical	2	2	2	2	2	Project adhered to RRU's Research Ethics Policy and the Tri-council Policy; invitations to participate were sent by a third party (to reduce pressure on subordinates to participate); participants had informed consent; anonymity and confidentiality were maintained; transcriptions sent to participants for verification; a section of the thesis is dedicated to ethical considerations for human dignity, informed consent, privacy and confidentiality, justice and inclusiveness, reducing harm, and enhancing benefits.
Positioning for Use	Strategic engagement	2	2	2	2	2	PI was well positioned to influence the context (e.g., former experience as an LPA, current managerial role in CATSA, CATSA support for the research); the opportunity to influence the creation, design, and implementation of the LPA certification program was identified by the project and followed up through a pilot after the project; continuous solicitation of feedback with relevant people in organization was strategic.
	New knowledge contribution	2	2	2	2	2	Contributed to PI's knowledge; filled an academic knowledge gap by documenting aspects of the CATSA context (e.g., first applied research project on the topic in this specific context); indications that the research informed individual and organizational learning (importance of consistency, measuring consistency, training); contributed knowledge on organizational practice gaps and LPA-informed recommendations for certification standards.
	Influencing attitudes	2	2	2	2	2	Research provided an opportunity to build awareness within CATSA on organizational learning, the lack of LPA certification, and need for LPA standards; awareness-building supported by sharing the recommendations; participants came to value the idea of a LPA certification program; project supported pride, self-esteem, and empowerment of LPAs; positive feedback from CATSA staff following the pilot indicates positive attitudes toward LPA certification.
	Capabilities	2	2	2	2	2	The PI build upon their research capacities; the PI's research and facilitation skills have been transferred to other aspects of their job; the PI intended for the study to provide a professional development opportunity for LPAs; LPA capacity-building likely supported by pilot.
	Relationship-building	2	2	2	2	2	Mutual interests between CATSA, the sponsor, LPAs, and the PI were recognized and leveraged; trust fostered with CATSA management via continuous consultations; trust fostered with research participants via the world café activities; following the project, CATSA stakeholders and CSTD worked together in new ways to run the pilot LPA certification program; the positive research experience bolstered the PI's professional working relationships within CATSA (e.g., coaching, mentoring, LPAs approached PI for advice after the project).

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	Practical application	2	2	2	2	2	Thesis reflects on value of inquiry and discusses the potential and intended benefits for CATSA, LPAs, and passenger safety overall; recommendations for a LPA certification program were developed for uptake by CATSA; a pilot LPA certification program was tested following the project; CATSA has standardized assessments that resemble the PI's recommendations (i.e., formal standards now exist for LPAs though these are not mandatory); one researcher uses the project as an exemplar research case study.
	Significant results	2	2	2	2	2	All ten intermediate and end-of-project outcomes were fully or partially realized, indicating clear contribution of the project; indications that the research resulted in positive outcomes for participants, LPAs, and CATSA; indications that the research was a catalyst for CATSA's pilot LPA certification program (e.g., several LPAs received certification through the pilot), but extent of organizational changes remain unclear owing to internal directional changes.

## Appendix 6. Evidence of Outcome Realization

### Legend: Outcome Realization

	Green = realized		Orange = not realized
	Light green = partially realized		Grey = insufficient evidence

**Table 8.** Extent of outcome realization, supporting evidence, degree of project contribution, and evidence rating

Expected Outcome	Summary of Results Realized	Evidence Supporting Results' Realization	Evidence Rating: Low (L), Medium (M), High (H) Justification
<b>Organizational Development Pathway</b>			
CATSA recognizes value of LPA training certification  [intermediate outcome]	The pilot project stemming from the CASP enabled LPAs to gain CTP/CTDP designation and supported CATSA in providing staff with professional development opportunities to advance their learning (Prac10). The fact that the pilot certification was adopted by CATSA prior to the DRAP implies that CATSA recognizes the value of LPA training certification. The recognition and validity of LPAs provided through the pilot certification process enhanced the awareness of LPAs' competencies within the organization and acknowledged them as providing the best training for airport security (Prac8). The CASP was successful at presenting the idea and gaining organizational support for a standardized training program for LPAs (Prac8). CATSA were supportive of professional development prior to the CASP with staff attending HQ for seminars on various aspects of the adult instructor role. Informants discussed how the PI, along with the support of senior staff, was successful in increasing the organizational understanding that if screening officers are to be certified and designated by Transport Canada then the same principle should be applied to the LPA role (Prac6). However, it eventually came down to the question of resources which slowed the pace of the LPA training certification initiative (Prac6).	<p><i>"The Prairies were the first one to get the LPAs to do the CTP process [...] so that was a big piece towards trying to give [LPAs] those extra pieces to help in the role of instructor or facilitator, and so every year [LPAs] have a learning plan with performance management reviews that [are] fill[ed] out [with] what pieces [LPAs] are going to complete in the coming year to [do better in their] role [...] [and] those of that have [the] certification, to maintain that as well" (Prac10)</i></p> <p><i>"[CATSA] had always done thing[s] previous to [the CTP process], [LPAs] would go to HQ twice a year in Ottawa and [CATSA] always brought in a speaker that did a session or seminar which worked on different areas or aspects [...] and different companies would come in and speak with [LPAs] about different pieces on being an adult instructor or facilitator or different courses. So, [CATSA] were always very supportive of that piece of [LPAs] career" (Prac10)</i></p> <p><i>"Eventually through [the PI's] presentation and [the] support [of senior staff] people under[stood] that if [CATSA] are going to certify screening officers to be designated by Transport Canada for such a level of security operations, trainers should be certified trainers, and they should be at the same level of a certified accountant or a HR professional [...] [they] wanted to apply this same principle to the LPAs and so there was a bit of a challenge because once [they] passed that it was a question of resources, of time and money" (Prac6)</i></p> <p><i>"The recognition, the validity of trainers and their competencies, that was the biggest point that should be the big sales pitch [...] when [CATSA] say [that] trainers are certified by an independent learning body that certifies trainers with certain competencies,</i></p>	<p><b>H</b></p> <p><b>Realized, clear project contribution</b></p> <p>The CASP successfully gained organizational support for the LPA training and certification process which supported the organization in recognizing the value of such process.</p>

		<p><i>that helps [CATSA] provide the best training for the security function” (Prac8)</i></p> <p><i>“Generally [the CASP] brought an open idea to CATSA at the time that there needed to be some sort of standardized program and I think that has carried forward to [the] screening contractor training program that again having this standard is really important” (Prac8)</i></p>	
<p>Participants recognize importance and contribution of LPA role</p> <p>[intermediate outcome]</p>	<p>The CASP provided participants with the opportunity to recognize an LPA’s knowledge and expertise to obtain more credibility. For example, the CASP supported the recognition that LPAs play an important role in terms of enhancing operations – to ensure operations are continually improving within CATSA to keep up with changing security threats, learning and development needs to be a part of the LPA role. The recognition gained by LPAs from going through the pilot assessment process increased the credibility of the LPA role with several stakeholders including screening contractors, screening officers, and with the management team at CATSA (Doc2). The CASP provided participants with the opportunity to further understand the importance of the advisory position in the LPA role to ensure that screening officers continue to uphold their standards of competency (Prac4).</p> <p>One informant stated that LPAs increasingly set the high standards for screening officers suggesting a recognition in the importance and contribution of the LPA role (Prac4). Senior CATSA staff discussed how the CASP provided them with the opportunity to reflect on the LPA role and the type of competencies for excellence they were looking for within the role (Prac6). Overall, this supported the increased recognition in the value of the LPA role by supporting a concrete definition on the complex array of skills required by LPAs (Prac8, Res2). The pilot certification process supported LPAs in establishing themselves and the importance of their position within the organization (Res2).</p>	<p>“Many participants mentioned recognition of an LPA’s knowledge and expertise to obtain more credibility. The world café participants mentioned [...] that recognition could increase credibility with several stakeholders: “Knowing what you are doing is recognized, and the credibility. Credibility with the people you work with, credibility with screening contractors, with screening officers, and with the management team at CATSA as well.” One interview participant reinforced the point that certification would recognize skills that are already present” (Doc2)</p> <p><i>“the contributions that the LPA has is a high-standard of setting the environment for brand-new [screening officers] so when they hit the floor, they do have that high standard as well to do the job every day, and that is one of the biggest contributions” (Prac4)</i></p> <p><i>“Yes [the CASP helped to recognize the importance and contributions of the LPA role] [...] [a new LPA is still working towards] realis[ing] the importance of being the advisor role within the company [...] the [LPA] role itself is more than learning and teaching, the advising piece comes in there. [LPAs] are not only advising brand new people who are going to be screening officers, but [LPAs] are also advising people who have been [in the role] for 5, 6, 10 years as well” (Prac4)</i></p> <p><i>“It was very interesting to read about the LPAs involvement, the new ideas, the contribution. And it kind of gives you an idea of who works for [CATSA] and how they think, how engaged they are in [the] program, so that was a big contribution for [senior CATSA staff] [...] plus [CATSA] had to do a bit of soul searching, what are the competencies [CATSA] are looking for in LPAs? It is always good to reflect and measure if you are still on track” (Prac6)</i></p> <p><i>“In the beginning, [CATSA] really didn’t look at [LPAs] at all and I think that’s when [the PI] started the program to say [CATSA] needed something in place to make sure that [LPAs] were</i></p>	<p><b>H</b></p> <p><b>Realized, clear project contribution</b></p> <p>Participants in the CASP, including LPAs and senior management, have an enhanced recognition of the importance and contribution of the LPA role due to raised awareness of the competencies required.</p>

		<p><i>consistent and qualified to a level to give the learners the best opportunity” (Prac8)</i></p> <p><i>“At the time [of the CASP] it definitely helped [the LPA role to be viewed with more importance], and then [the organization] went through a transition. But I think what [the CASP] did was allow [...] for a concrete definition of what is an LPA and what does that require [...] when somebody knows that [LPAs are] certified to the job they realize that it is not just anybody [that can do the job]” (Prac8)</i></p> <p><i>“The [CASP] drove some importance of the LPA role and setting standards, including ensuring a level of consistency and measuring that consistency” (Res2)</i></p> <p><i>“[For] the LPAs that went through [the CTP process], it helped them in kind of establishing themselves and it escalated the ideas and the importance [of the position] to the organization” (Res2)</i></p> <p><i>“I think the LPAs play an important role in terms of enhancing operations; we need to enhance Screening Officers abilities [...] if our continued goal is to keep them motivated, interested, and highly skilled, we need to make sure that learning and development and LPAs are brought into the equation, because that is how we are going to get there” (Doc5)</i></p>	
<p>CATSA management decision-making is influenced (principles of continuous learning, trainers’ standards)</p> <p>[EoP outcome]</p>	<p>Informants suggested that the CASP effected senior manager’s decision making, however, following the DRAP the Learning and Development Department reduced training options (Prac6). The pilot certification program was supported by managers and results were shared to other CATSA regions across Canada. Without the organizational cuts, it is hypothesized that the CASP would have had a longer lasting effect on CATSA management decision-making towards principles of continuous learning and trainers’ standards (Prac6). However, as a result of the CASP, senior staff reflected on the desired competencies of the LPA role which resulted in the onboarding checklist and competency assessment that remain a practice of CATSA today (Prac6).</p>	<p><i>“At the time I thought [the CASP did effect senior managers decision-making], now I don’t know [...] when the DRAP occurred learning and development was the first director that got hit and it’s very unfortunately it happens a lot when organizations have to cut budgets that training is the first one to get hit [...] I’m sure [senior managers] found the results very interesting, meaningful, but they were in a context of limited enthusiasm [due to budget cuts]” (Prac6)</i></p> <p><i>“It was very interesting to read about the LPAs involvement, the new ideas, the contribution. And it kind of gives you an idea of who works for [CATSA] and how they think, how engaged they are in [the] program, so that was a big contribution for [senior CATSA staff] [...] plus [CATSA] had to do a bit of soul searching, what are the competencies [CATSA] are looking for in LPAs? It is always good to reflect and measure if you are still on track” (Prac6)</i></p>	<p><b>M</b></p> <p><b>Realized, clear project contribution</b></p> <p>CATSA management supported the adoption of the LPA certification pilot and the subsequent creation of the onboarding checklist highlighting the influence of the CASP on CATSA management decision-making.</p>
<p>Research methods adopted into the</p>	<p>Informants discussed how research methods used by the CASP, such as the World Café, had been adopted into CATSA</p>	<p><i>“GardaWorld runs world cafés [...] [GardaWorld have] run several where CATSA has been a participant and usually [there</i></p>	<p><b>H</b></p>



<p>organizational process</p> <p>[EoP outcome]</p>	<p>organizational practice and expanded to Service Contractors. World Cafés have been used by Service Contractors to increase screening officer morale and share new training procedures (Prac15, Res2). The PI is noted to have been a driving force behind the implementation of World Cafés into CATSA organizational practice by introducing them to the Prairies region (Prac9). The World Café method is viewed by both employees and employers as valuable and highly beneficial (Prac9). The World Café method is noted to have influenced the way that CATSA “does business now” to develop continuous improvement approaches across different CATSA regions, with full credit given to the PI for the introduction to this method (Prac9). The World Café method has changed the way CATSA interacts with customers and has been a key driver for change in certain regions of CATSA (Prac9). The PI has also adopted action research within their continued work at CATSA in the adapting and evolving organization, and strongly values pilots (a method highlighted within the CASP) in reflecting on change and adapting ways of working. However, one informant was unaware of any CASP research methods that had been adopted into CATSA organizational practice, possibly due to the time that has passed since the CASP data collection (Prac3).</p>	<p>are] <i>certain topics of focus [...]</i> [for example] <i>a new training procedure [...]</i> [a] <i>regular one is morale, trying to find ways to boost screening officer morale</i>” (Prac15)</p> <p>“[World Cafés] <i>started as a CATSA project and is something that [the PI] was the driving force behind and [CATSA] have now taken on as an ongoing continuous admission of [their] own [...]</i> [the PI] <i>did bring in the world café concept to the Prairies region [...]</i> <i>and it was something that had a great deal of value from employees [...]</i> <i>from [the CATSA] perspective as an employer, [CATSA] saw it as something so valuable that [they] maintained it [...]</i> <i>that was highly beneficial to [CATSA] [...]</i> <i>that is part of the way that [CATSA] do business now came out of those World Café formats in terms of developing corrective actions and continuous improvement approaches. [The PI] brought that concept in and it is something that [staff] hadn’t heard [of] and it is something [that has been] actually recommended to [another CATSA] region and they have adopted it as well with positive feedback</i>” (Prac9)</p> <p>“[World Cafés] <i>definitely changed the way [CATSA] interact[s] with customer[s]... [World Cafés] have become a key driver for change in [a CATSA] region. And again, full credit to [the PI] for that</i>” (Prac9)</p> <p>“<i>The [PI] has used action research a lot throughout the last 10 years within CATSA in adapting and evolving the organization. The world café is also used within CATSA. [The PI] now approaches things with the ‘plan, act, observe, reflect’ outlook, and reiterates the value of pilots in reflecting on what’s changed, adapting, and releasing an improved version</i>” (Personal communication)</p> <p>“<i>Nope [I am not aware of any of the PI’s research methods that have been adopted into organizational practice]</i>” (Prac3)</p>	<p><b>Realized, clear project contribution</b></p> <p>The CASP clearly introduced the World Café method to CATSA and service contractors which has been adopted into organizational practice and is strongly valued throughout the organization.</p>
<p>CATSA recognizes recurrent learning requirements, values continuous learning, and upholds in practice</p> <p>[high-level outcome]</p>	<p>Informants discussed how recurrent learning requirements have also been a part of LPA performance management at CATSA with LPAs being encouraged by the organization to build professional development opportunities into their yearly performance plans (Prac10). Informants also discussed how the largest selling point of CASP outputs were the recognition and validity of LPAs having gone through the pilot assessment process and gained certification, suggesting an organizational awareness and valuing of continuous learning (Prac6). Recurrent learning requirements have also been a feature of the screening officer position over the last ten years which have evolved based</p>	<p>“[recurrent learning requirements were] <i>always a part of [LPA] performance management piece and [CATSA] have always been very supportive if [LPAs] want to take a course, a seminar or whatever, it is encouraged and built into [the LPA] performance plan for the year</i>” (Prac10)</p> <p>“[screening officers] <i>have always had recurrent learning in those 10 years, it has just evolved based on systems and based on, again, it is usually resource based [...]</i> [screening officers] <i>used to do one e-module per quarter, and then that changed to 3 e-modules and 1 hands-on exercise, so that was one of the big changes that [was] implemented a few years back. But it has always been a quarterly</i></p>	<p><b>M Realized, clear project contribution</b></p> <p>CATSA, as a learning organization, have always been aware and focused on recurrent learning requirements which</p>

	on resources available (Prac5). However, the format of the learning recently changed to a more online, e-learning base – it is uncertain from evidence if this is related to the CASP (Prac5).	<i>requirement for the screening officers to complete and it is always the same thing across the country” (Prac5)</i> <i>“The recognition, the validity of trainers, their competencies, that was the biggest point that should be the big sales pitch. In other words, in front of other government departments, in front of police forces, all the stakeholders [CATSA] work with, airport authorities, when [CATSA] says trainers are certified by an independent learning body that certifies trainers with certain competencies that helps [CATSA to] provide the best training for the security function” (Prac6)</i>	was supported by the CASP.
CATSA develops LPA certification program  [high-level outcome]	<p>The CASP was successful in leading CATSA to develop a pilot LPA certification program which was developed in collaboration with the PI and senior leaders at the organization (Doc2, Doc4, Doc8, Prac9, Res1). By involving senior management, Learning and Development managers, and the Learning and Development group in discussions around the draft certification framework, CASP participants had the opportunity to provide feedback to contribute to the amended framework (Doc2). The PI was the leading implementer in the pilot LPA certification program due to the PI’s belief in consistency across LPAs and providing tools to allow LPAs to perform at the best of their abilities (Prac10). The Prairies region of CATSA was the first region to encourage LPAs to gain their CTP/CTDP, with LPAs noting their excitement to complete the certification process (personal communication). The certification program developed by CATSA supported LPAs in growing as trainers, facilitators, and advisors, and ensured that LPAs had a level of consistency (Prac4, Prac8).</p> <p>Although the initial certification program that was developed out of the CASP is not mandatory as a result of the DRAP, LPAs are still required to go through assessment and certification processes to maintain their competencies (Prac1, Prac4). For example, some informants stated how the certification evolved into oversight training and an onboarding program which has many similarities with the original certification program (Prac8). With airport functions expanding due to technology improvements and evolving threats, LPAs are constantly being updated with new information (Prac2). LPAs who went through the certification program as a result of the CASP are also supported by CATSA to maintain their certification and are re-enrolled into CTP/CTDP membership (Prac4).</p>	<p>“From [CASP] information, a draft certification framework was presented and discussed. It was agreed that the data conclusions, certification program recommendations, and a draft framework would be presented to senior management, learning and development managers, and the learning and development group for further discussion, input, and approval. By involving these groups, almost all [CASP] participants will have the opportunity to provide more feedback if they choose. The amended framework or frameworks will be presented to senior management with a few different budget options. Senior management will review the conclusions, recommendations, and framework to approve next steps.” (Doc2)</p> <p><i>“The Prairies was the first [region] to get the LPAs to do the CTP process, [sic] was actually the first one that got certified in the prairies, so it was kind of exciting, it was a big deal!” (Prac10)</i></p> <p><i>“I think [the PI is] the one that got the whole ball rolling for everything that has happened regarding the LPA certification piece, that was why [it was] trialed in the Prairies, so [the PI] has definitely been a big supporter and proponent of that. And I think [the PI] felt it was important that all the LPAs were on the same page [...] and to give [LPAs] that extra tool and knowledge to be able to perform to the best of their abilities as facilitators and instructors” (Prac10)</i></p> <p><i>“[LPAs] definitely have to get certified and signed off for certain functions [...] the LPAs have to get certified on teaching all those functions [...] the airport and all the functions that [are] covered has expanded exponentially, so [LPAs] are constantly being updated with information” (Prac2)</i></p> <p><i>“[LPAs who completed the CTP] still have to maintain that certification. So, every year CATSA re-enrolls [these LPAs] into</i></p>	<p><b>H</b> <b>Realized, clear project contribution</b> The CASP and PI were the key implementing factors in the development of an LPA certification program at CATSA which was developed in collaboration with senior staff and recommendations from CASP participants.</p>

		<p><i>membership into the learning institute, so CATSA supports [LPA] yearly continuous education plans” (Prac4)</i></p> <p><i>“A lot of the stuff that [LPAs] have learnt over the years really started off with the certification piece, and that helped [LPAs to] grow as trainers, as facilitators and as advisors. I think that has been the biggest thing is that [LPAs] supported by manager[s] to go out and get additional training or request additional training to further [their] careers and [their] personal development” (Prac4)</i></p> <p><i>“When [the PI] started the program to get [LPAs] certified, at that time LPAs came from a range of backgrounds and it was something to get all [LPAs] on the same page and take [LPAs] forward, and it definitely did that [...] [there is] a huge difference in the LPAs who have gone through the certification program compared to the ones that haven’t” (Prac8)</i></p> <p><i>“[the original certification standard evolved into this new oversight training], it is an oversight program of [LPA] training, and then an onboarding program. So, for any new instructor coming on [CATSA] put them through an onboarding program and it’s got a lot of similarities to the certification standards” (Prac8)</i></p> <p><i>“Catalyzed by [the PI’s] ingenious intervention strategy, CATSA has now embarked on the strategy recommended by [CASP] participants in the findings and the recommendations. I do not know of many organizational change initiatives, even among projects conducted by professional organization consultants that have been met by the complete organizational enthusiasm and follow through as has been seen in [the PI’s] thesis process” (Res1)</i></p>	
<p>CATSA pilots LPA certification program</p> <p>[high-level outcome]</p>	<p>Informants discussed how certain CATSA regions piloted the initial LPA certification program inspired by the CASP and led by CATSA in partnership with the Canadian Society for Training and Development (CSTD) now the Institute for Performance and Learning (I4PL) (Prac4, Prac6, Res2). Six LPAs completed the pilot certification process and achieved their certified status. CATSA also approved the pilot project through paying for LPAs to complete the external certification process (Prac6). It is suggested that CATSA supporting the pilot and investing in the certification process (paying for examination fees) is a testimony to the contribution of the CASP and the PI’s work (Prac6). The findings of the pilot were shared with the wider organization and LPAs who completed the pilot certification process were involved in constant communication to gather feedback on the process (Res2). Before the pilot could be implemented to other regions of CATSA, the organization faced restructuring of the</p>	<p><i>“When [the PI] pushed forward the idea [of the certification program] [...] the Western [region] LPAs were the guinea pigs to go through the certification piece” (Prac4)</i></p> <p><i>“Some LPAs did get certified and CATSA was approving it as a pilot project [...] I don’t know what the current situation is, if it is still a program, if it’s still enforced. I know [CATSA] did pay for the testing, the exams from an external organization” (Prac6)</i></p> <p><i>“Just to have a pilot project and CATSA investing in the designation, paying for the designation for the 6 or 7 LPAs and potentially paying for the courses to keep up their designation is a huge testimony of [the PI’s] contribution. [The PI] is the lead on this, all of the other managers looked up to [the PI] for advice and they believed in the program as well because [the PI] was the lead” (Prac6)</i></p>	<p><b>H</b></p> <p><b>Realized, clear project contribution</b></p> <p>A pilot LPA certification program took place in certain CATSA regions as a result of the CASP. The DRAP resulted in the pilot not expanding beyond these regions.</p>

	Learning and Development Department due to the deficit reduction (e.g., budget cuts) which led to significant changes in terms of staff and resources available to support the wider pilot of the certification program (Res2).	<p><i>“Shortly after [the CASP], [CATSA] went through a deficit reduction, as did the whole government, which had an impact. The pilot [certification] took place in the ‘West’ region at the time which has now been re-established as ‘Pacific and Prairies’. Before the pilot could be implemented in the rest of the country, the organization faced restructuring of the learning and development department which led to significant change in terms of staff” (Res2)</i></p> <p><i>“CATSA completed a pilot of LPA certification which communicated the findings to the wider organization. The LPA’s that completed this pilot were involved in constant communication to gather feedback on the process. CATSA partnered with the Canadian Society for Training and Development to implement this pilot. The restructuring took place shortly after the end of the pilot” (Res2)</i></p>	
<p>CATSA increases consistency and effectiveness of training delivery and assessment (tools/documentation created)</p> <p>[high-level outcome]</p>	<p>CATSA has increased consistency and effectiveness of training delivery and assessment by creating tools, procedures, and competency guides (Doc1). CATSA also developed facilitation guides detailed for course and training delivery to improve consistency and effectiveness (Doc1). Informants have witnessed progression in terms of the training they completed when joining the organization, compared to the onboarding training now, which has resulted in increased success rates and effectiveness, and improved candidate selection – this is also an aspect promoted by the PI (Prac15). Although CATSA no longer requires a formal certification program to be completed by LPAs, the organization have developed an onboarding checklist which has supported increased consistency across LPAs (Prac5, Doc1). Informants stated that the PI supported the development of the onboarding checklist following the CASP, which was trialed in the Prairies region and then implemented nationally (Prac12, Prac13). This internal process is an informal method of certifying the LPAs (Prac12). A competency guide for all CATSA LPAs was also developed which contained essential area themes for LPAs to rate themselves against to ensure consistency across LPA skills sets (Doc3). However, some informants also suggested that consistency remains a challenge across LPAs (Prac7).</p>	<p>“CATSA created specific procedures and guides for a number of processes to ensure consistent application by LPAs. They also started making facilitation guides detailed for course and training delivery for that purpose.” (Doc1)</p> <p><i>“[CATSA] are always trying to make improvements, and [CATSA] always look at how [they] are doing things. Because of the job that [CATSA] do, the environment is always changing, so [CATSA] are always trying to make improvements and changes for the better” (Prac10)</i></p> <p><i>“A formal onboarding checklist was created for LPAs that are new to the role. This has to be completed and has different milestones and completion activities for the first month, 3 months, 6 months etc.” (Doc1)</i></p> <p><i>“I have definitely seen some progression in terms of the training that I went through a decade ago versus the training that training specialists do now [...] That has been a big focus over the years is trying to get hire success rates, trying to get better candidates to courses, [CATSA] candidate selection, that’s something I know [the PI] has pushed for” (Prac15)</i></p> <p><i>“[LPAs are] inconsistent for sure. I know they try to be consistent when it comes to skills assessment, they did come up with a booklet and they all kind of follow it now with questions and answers that they expect from screening officers, but when it comes to hands on it is still different for sure” (Prac7)</i></p> <p><i>“The onboarding checklist requires that [LPAs] take the training that they will eventually be delivering [...] [LPAs] have to take the</i></p>	<p><b>H</b></p> <p><b>Realized, clear project contribution</b></p> <p>CATSA increased consistency and effectiveness of training delivery and assessment through the pilot certification program. The PI has also been instrumental in developing the onboarding checklist and competency guide to increase the consistency across all LPAs.</p>



		<p><i>training, they have to then co-teach, and the co-teach has to be repeated until the more experienced LPA indicates that they are ok to go ahead and teach a class on their own. But even that is done with another LPA observing and again that phase goes on until the observing LPA signs them off and says that they are good to go on their own” (Prac5)</i></p> <p><i>“In some ways, the onboarding checklist is sort of [CATSA’s] internal process for ‘certifying the trainers’, it doesn’t necessarily include adult learning principles and all that sort of stuff” (Prac12)</i></p> <p><i>“[The onboarding checklist] is a step by step of what [LPAs] need to do and where they should be by a certain time frame [...] [The PI] was the one that created it. [The PI] started in [their] region and then it became a national thing” (Prac12)</i></p> <p><i>“Since [the deficit reduction], CATSA doesn’t require a certification program like they did in the past, but what they do now is they conduct oversight audits of [LPA] training and they watch [LPAs] instruct [...] CATSA standardized the instruction and then they have an onboarding program that they use; when I look at [the onboarding program] it looks very similar to [the PI’s] original certification standard for [LPAs]” (Prac8)</i></p> <p><i>“From the training and evaluation perspective, trainers would have course evaluations – these evaluations focused on the effectiveness of the trainer’s themselves, not necessarily the training program” (Prac13)</i></p>	
<p>CATSA values adult learning and certification (awarding of skill set, LPA skills set, lists CTP certification as an asset)</p> <p>[high-level outcome]</p>	<p>Although the certification process which arose from the CASP is not mandatory for LPAs, informants suggested that CATSA encourages adult learning and sees the value in the CTP/CTDP designation (Prac10). CATSA did originally list CTP/CTDP as an asset, but with institutional change (e.g., DRAP), this was removed. Some informants were not aware of any changes in hiring practices to focus on CTP/CTDPs or listing the certification as an asset (Prac10). Others stated that with the move of CATSA to a private organization, it is likely that there will be a greater focus on consistency and following the same training guidelines (Prac8). CATSA is noted to support having a qualification program and a standard that all staff must meet, and it is likely that this may be a greater focus in the future (Prac8).</p>	<p><i>“No, [LPAs] don’t have to [go through the CTP process] [...] [but it is encouraged] for sure” (Prac10)</i></p> <p><i>“No, I would not be aware of any [changes in CATSA hiring practices to focus on CTP]” (Prac10)</i></p> <p><i>[I think things will change with the privatization] [CATSA] need a program and [CATSA] need senior advisors to onboard new instructors to make sure they’re consistent and follow the same training guidelines that [CATSA] use. Currently [CATSA] are in the midst of change, so there is no appetite to develop a whole program, but I think it is definitely something [CATSA] will see in the future. I think CATSA generally likes to have a qualification program and the standard that everyone has to meet, I think even in the future it is something that would happen more” (Prac8)</i></p>	<p><b>M Realized, clear project contribution</b></p> <p>As a learning organization, CATSA have also supported adult learning, however, a formal designation is not mandatory for LPAs</p>
<p>Service contractors do their own training (install standards of trainer competencies)</p>	<p>Informants discussed how many previous LPA responsibilities have now been handed to training specialists (Prac8, Prac11, Prac16). For example, due to the volume of training increasing dramatically as a result of airport expansion and new technology,</p>	<p><i>“Before, [the LPAs did] lots of things, but now they give so many responsibilities to the trainers, there is so many things that the trainers are doing now. Today the trainers are doing so much, [LPAs are] giving [trainers] so much responsibility” (Prac11)</i></p>	<p><b>H Realized, unclear project contribution</b></p>

[high-level outcome]	<p>more training has been delegated to service contractor training specialists who have become leaders (Prac5, Prac7). LPAs now train the trainers and have handed some of the lower risk training to service contractors (Prac5). Service contractors have begun to create their own training on top of the information provided to them by CATSA focusing primarily on enhancement training (Prac11). Some service contractors develop quarterly improvement plans, training material, and complete analysis to help screening officers improve in their problem areas and to determine how training specialists can deliver training of a higher standard (Prac15). Informants also discussed the “Advanced Response Team” which is used to assess negative outcomes in screening (personal communication). This is based on the collaborative relationship between CATSA and Service Contractors to develop new processes and approaches to lead to positive outcomes in screening (personal communication). Through the CASP, CATSA has set the standard for LPAs raising the importance of consistency and competency across all screening operations (personal communication).</p> <p>Training specialists discussed how this increased responsibility allowed them to feel like leaders and learn more about their role (Prac7).</p>	<p>“[Service contractors] are creating [their] own training on top of what CATSA is giving [them] [...] [service contractors] try to give enhancement training for the screening officers” (Prac11)</p> <p>“[Service contractors] develop quarterly improvement plans where [they] can release training to screening officers to help them improve their problem areas. [Service contractors] do a lot of analysis to try and determine what [screening officers] struggle with, what are the reasons behind their struggles, and what training can [service contractors] give them that will have the biggest effect to improve those problem areas” (Prac15)</p> <p>“There’s a couple of changes when it came to what the training specialist is actually teaching [...] based on [service contractor] results and the non-compliances it was something that was changed where [LPAs] will no longer be teaching [train the trainer], [service contractors] will be teaching it [...] They took it from the LPA and gave it to the training specialist and vice versa, those are the changes that [the PI has] contributed in” (Prac16)</p> <p>“The most important development is that [CATSA] have been delegating a lot of [the] lesser or lower risk training to third party contractors whereas the LPAs previously used to do all of the training, [the] volume of training has increased so dramatically that [LPAs] are just not capable of keeping up [...] so the LPAs now have to sign off, they essentially do train the trainers for these SCTRs and hand off some of the lower risk training to them” (Prac5)</p> <p>“[Training specialists] like [training the screening officers] because [they] get to learn more about [their] job than what [they] needed to learn, so of course [they] feel like a leader, [they] feel that [they are] basically like a trainer rather than being more of a trainer assistant” (Prac7)</p> <p>“LPAs almost took a step back and then training specialists became more of the lead of the class altogether” (Prac7)</p> <p>“The advanced response team, which is something [service contractors] use to look at negative outcomes in screening with the idea that [service contractors] and CATSA get together collaboratively and try to find out new processes, new procedures and new approaches that may lead to positive outcomes in screening” (personal communication)</p>	<p>Service contractors have taken a more leading role in completing their own screener training and have instilled standard of trainer competencies. However, it is unclear to what extent this is connected to the CASP due to a number of alternative explanations.</p>
Operations department recognizes performance and	<p>The CASP is noted to have contributed to an understanding of operations, however, informants were unable to describe further potential contributions (Prac3). CASP findings (e.g., identifying</p>	<p>“Other than the understanding of the operation and everything, I am sure there has been some impact [of the CASP], but I couldn’t put a finger on it” (Prac3)</p>	<p><b>Insufficient evidence to make an assessment</b></p>

learning contributions to screening effectiveness  [high-level outcome]	the value of continuous adult learning) were shared with Operations Department staff to build awareness and increase recognition. Prior to 2012, the Operations Department were separate from the Learning and Development team which has since shifted. The Operations Department and Learning and Development team now work more cohesively as one team and report to the same department		
Screeners are more consistent and improve their screening practices  [high-level outcome]	The PI is noted to have good working relationships with service contractors which supported the PI in identifying gaps for frontline screeners and make recommendations to improve the efficiency and effectiveness of screening (Prac14). This PI is an advocate for continuous learning to support improvements across CATSA (Prac14). Informants discussed how the PI instilled momentum and created significant impact to overall screening effectiveness due to their work on the topic (Prac14). With LPAs becoming more consistent through the evaluation and certification process, this has had a spillover effect on screeners with the process now being smoother and information resonating more with screeners (Prac2). The PI's support in extending the training program to SCTR's has improved screening effectiveness due to SCTR's having increased credibility and a similar standard of training as the LPAs (Prac9). LPAs were noted to be a significant force for improving the effectiveness of screening officers who have become improved evaluators as a result of a more defined program due to the CASP and PI (Prac9). Improved LPA competencies gives screening officers the confidence to perform a high-risk job effectively and efficiently. One informant stated that because of the work the PI has done, CATSA and its operating partners can deliver best class service in the world with groups from the USA, Europe, and Israel visiting Canada to learn from CATSA and its operations, which is a credit to the PI and the CATSA team (Prac9).	<p>"[The PI] is very good at the people side of things which has driven a lot of teams, not only with the CATSA groups, but also with the service contractor and the relationships" (Prac14)</p> <p>"[The PI] was able to identify gaps and what is missing for frontline screeners and make those recommendations [...] when [CATSA] changed the SOF they made it more compact, they made it smaller" (Prac14)</p> <p>"[The PI] I think even with [their] own team, is a big fan of continuous learning and always trying to improvements and that has probably been the biggest win for [the] CATSA team" (Prac14)</p> <p>"Absolutely [the constant assessment of LPAs is supporting consistency], because there is so much information that they have to be responsible for that if they just don't know, like if you have a class of new people and you just don't know what you're talking about on one specific item, all your credibility goes out of the window [...] so it absolutely makes a difference constantly providing updates and training. You are keeping the machine polished basically" (Prac2)</p> <p>"[The LPA] group is a significant force for improving screening operations and they've also become much better evaluators of initial skills development with screening officers. Before I think they were, maybe it is an improper term, scattershot in their approach, now there is a defined program that is also enhanced by the fact that they now have these skills that they were lacking before" (Prac9)</p> <p>"[Screeners] have so many challenges and threats to health and safety, but the [LPA] competence gives screening officers the confidence they need to go about doing their job properly. So, because of what [the PI] has instituted here, I think [CATSA and partners] are delivering a best-in-class service, not just within Canada but within the world. We have had groups from TSA, Europe, even the Israeli services have come here to watch how we do what we do. That's a credit to [the PI] and [their] team" (Prac9)</p>	<p><b>H</b> <b>Realized, clear project contribution</b> The increased competence and confidence instilled in LPAs from the CASP certification and evaluation processes have spilled over to screeners to increase their consistency and improve their own screening practices.</p>

		<p><i>“When [the PI] came to [the airport], it must be going into 8 years now, we had never seen the momentum and the significant impact to overall effectiveness as we did until [the PI] arrived” (Prac14)</i></p> <p><i>“The fact that the [training] program was then extended out to the contractors through that SCTR program has enhanced [screening officers’] credibility as well. Everyone knows that [contractors] are trained to a very similar standard to the LPAs so that they know they have a certain competence and confidence in the delivery” (Prac9)</i></p>	
<p>CATSA develops a national certification training program for service contractors</p> <p>[high-level outcome]</p>	<p>CATSA developed and implemented a certification program for Screening Contractor Training Specialists (SCTRs) who work closely with LPAs to train screening officers and assist the LPAs in conducting courses (Doc1). A formal certification was put in place for this group to attain and maintain certification by completing continuous learning activities (Doc1). Informants suggested that the service contractor training program arose as a result of the CASP and LPAs gaining a standard of certification and assessment (Prac8). It was a natural progression from the LPA certification for a certification requirement for service contractors to ensure consistency and effectiveness at all levels of CATSA services (Prac8). This also resulted in CATSA further defining different roles, positions, and agencies, and requiring a demonstration of skills to fulfil the role (personal communication). Service contractor training programs have enhanced their credibility so that service contractors are trained to a similar standard as LPAs resulting in increased confidence in the delivery of training (Prac9). Informants also discussed how the training for screening officers had changed over the years (including improved language and documentation) to create more formalized criteria to ensure screening officers are competent and successful within their roles (Prac15). The PI is noted to have been a leading developer in screening officer onboarding and the screening officer foundation (Prac15).</p>	<p>“There was a certification program created and implemented for the Screening Contractor Training Specialists (SCTRs). This group works closely with the LPAs to train Screening Officers and assist the LPAs in courses [...] [CATSA] put a formal certification program in place for this group and [they] have to attain certification to conduct training activities. There is also a requirement to maintain certification by completing continuous learning activities” (Doc1)</p> <p><i>“I think [the CASP is] where the SCTR program actually came from. I think once [CATSA] certified the LPAs and got them to a standard, I think it was just a natural course that [CATSA] looked at the training assistants [CATSA] had or the SCTRs and what standard were they at” (Prac8)</i></p> <p><i>“The fact that the [LPA training] program was then extended out to the contractors through that SCTR program has enhanced my staff’s credibility within the Screening Officer contingent as well. Everyone knows that [service contractors] are trained to a very similar standard to the LPAs so that they know they have a certain competence and confidence in the delivery” (Prac9)</i></p> <p><i>“I have seen changes over the years in terms of the number of days the [screening officer] course runs, all the material that is on various tests, different ways [LPAs] do practical certification criteria changes, making more formalized criteria that must be hit in order to make sure screening officers are competent in the various screening functions. So, I have definitely seen a lot of improvement in the language that, with the documents that the SOPs have to follow to state screening officer must do this, this, this and this in order to be successful” (Prac15)</i></p> <p><i>“I know that [the PI] has been working on the screening officer onboarding and the screening officer foundation [...] I have definitely seen some progression in terms of the training that I went</i></p>	<p><b>M</b></p> <p><b>Realized, clear project contribution</b></p> <p>A national training program for service contractors was developed by CATSA which was inspired by the PI’s work in the CASP.</p>



		<i>through a decade ago versus the training that training specialists do now” (Prac15)</i>	
Service contract trainers are better positioned to be hired as LPAs and training for transition is shorter  [high-level outcome]	Service contractors discussed how a number of service contract trainers had moved into LPA roles as a result of their exposure to standard operating procedures (SOPs) and being viewed as top performers, often with an adult training background (Prac14). With service contractor trainers now having to be certified on functions similar to the LPA position (due to the expansion of airports and the expansion of the service contractor role at airports), service contractor trainers are going through a similar training experience to LPAs. Therefore, it can be expected that service contractor trainers are better positioned to be hired as LPAs with the training for transition shorter (Prac2). Service contractor trainers also have to work partnership with LPAs to deliver both the hands-on training and the evaluation (Prac2). With service contractor trainers and LPAs having a more similar role now, the transition between roles is shorter due to overlap (Prac7). Service contractor trainers are also noted to have more on-the-floor experience than LPAs, with most having been screeners themselves in the past (Prac7).	<p><i>“[There have been] a few people who have left [service contractors] and gone into the LPA role because of their exposure to the SOP, the frontline screening officers and things like that [...] often [the PI] pull[s] from [the service contractor] team, [the PI will] pull a top performer who has a training background or an adult training background to be polished into a support LPA role” (Prac14)</i></p> <p><i>“Trainers have to be certified on all [the LPA] positions as well. Now [they] don’t have to be certified on every little function like an LPA does, but it’s advantageous to be certified on all of them or as many as [they] can possibly be certified on [...] ever since the airport expanded and since [service contractors’] role at the airport has expanded, as part of the sign off for new people, or new certifications I should say where the officers have to go through so many hours on the line, on the functions, doing the job, so [they] have to be certified in that area as well. I would say [trainers are] going through almost the same number of updates and training [as LPAs], constant training for sure” (Prac2)</i></p> <p><i>“[Service contractor trainers and LPAs] are speaking the same material. [Service contractor trainers are] the hands-on people and [LPAs] are the evaluators, so [they] have to absolutely work hand in hand in that aspect” (Prac2)</i></p> <p><i>“The fact that training specialists and LPAs do such a similar job now it becomes kind of like a transition, if the [LPAs] went to a meeting and [service contractor trainers] had to take over nothing would have changed because the material is there, it’s just [service contract trainers] have more on-floor experience because of being with screening officers and being screening officer in the past” (Prac7)</i></p> <p><i>“I think [overlap in the SCTR and LPA role] has in some ways allowed [service contractors] to recognize those exceptional SCTR’s” (Prac8)</i></p>	<p><b>M</b> <b>Realized, unclear project contribution</b> The CASP resulted in SCTR’s being assessed to a similar standard as LPAs shortening the training for transition. It is uncertain from evidence to what extent this is connected to the CASP</p>
Performance across CATSA departments becomes more integrated and systematic  [high-level outcome]	There has been increased cooperation between different colleagues and departments across CATSA with departments sharing ideas and strategies for improvement (personal communication). The LPA is seen as a position that has an in-depth awareness and understanding of regulations and can communicate these elements to all members of CATSA (whether managers or screening officers) which was enhanced by the CASP (Prac4). The CASP raised the importance of the topic of	<i>“I think one of the biggest things is that it does produce a lot of cooperation between the different colleagues that [CATSA] have from the different groups, whether it’s the manager of operations, where it’s one of our performance oversight officers, the LPA is seen as someone who is aware of the regulations and understands the regulations, but is also able to break things down to whether it is a manager who is looking at and trying to improve the number of minutes a passenger spends at the check point or things like that.</i>	<p><b>M</b> <b>Realized, clear project contribution</b> The CASP raised the importance of training and consistency across</p>

	consistency across all departments at CATSA which has resulted in department discussions always including the topic of training, with increased overall awareness that training supports consistency (personal communication). Prior to the CASP, the topic of consistency was not discussed within CATSA (personal communication)	<i>So, I think that really does increase the work between different branches of our focus” (Prac4)</i>	all departments at CATSA resulting in performance becoming more integrated and systematic.
<b>Capacity-building of LPAs Pathway</b>			
Participants recognize training and assessment gaps  [intermediate outcome]	CASP participants stated how the research had supported LPAs in recognizing training and assessment gaps (Prac10). Most LPAs who participated in the research had a positive reaction due to the notion amongst the profession of striving to have consistency. This was a key element which was raised and highlighted within the CASP (Prac4). The assessment and certification program developed by the CASP provided engaged LPAs with more motivation and assurance to contribute to and improve CATSA’s training program (Prac6).	<i>“I believe most LPAs [who] participated in the [CASP] had a positive reaction to it because [LPAs] all strive to have consistency among [themselves] [...] [LPAs] are spread out across the country and [...] are all teaching the same thing throughout the year [...] but that was something that [LPAs] talk about which is consistency and being able to have a framework to help the LPAs develop and get better at things and help people receive the training in a positive manner” (Prac4)</i>  <i>“The assessment and certification program, gave [engaged LPAs] even more motivation, and second assurance that they can, the self-esteem, that they can provide and contribute to CATSA’s training program [...] I think that is the biggest benefit, the self-esteem was higher predominantly and therefore they were better contributors to improve the program” (Prac6)</i>	<b>M Realized, clear project contribution</b> LPA CASP participants recognized their training and assessment gaps as a result of participating in the project and had a positive reaction to the need for consistency.
Participants gain knowledge of adult learning  [intermediate outcome]	Completing the pilot LPA certification process as a result of the CASP allowed some LPAs to gain knowledge of the difference between training and advising within their role, with certified LPAs having a greater understanding of the depth and need of the advisory piece within their position (Prac4). The LPA certification also supported LPAs in developing as trainers, facilitators, and advisors, and are supported by managers to complete additional training to further their careers and professional development (Prac4).	<i>“When [LPAs completed the] certification, the different courses that [LPAs] attended and went through really links to the role of being an advisor because [LPAs] do more than just training. Training is part of [LPA] duties, but the biggest thing is that [LPAs] are also an advisor and [LPAs] are always advising on whether [they] need to revamp training for screening officers, or whether [LPAs] need to evaluate screening officers. But also [LPAs are] there to support the operational groups and try to either make the screening experience better for passengers or looking at ways to make [screeners] more efficient or effective. So, the advisor piece does come out most of the time, I would say it is probably a 60-75% of [LPA] time [they] are advising people and I think that’s one of the biggest things from being certified that compares to being non-certified LPAs, that they don’t see the advisor piece as big as it actually is” (Prac4)</i>  <i>“When [sic] became an LPA, [they] didn’t really have a training background per say [...] [they] didn’t have like a formal teacher’s education [...] So, a lot of the stuff that [they] have learnt over the years really started off with the certification piece, and that helped</i>	<b>L Partially realized, clear project contribution</b> Due to the time that has passed since the CASP process, participants struggled to determine between outcomes as a result of the CASP and as a result of the PI continuing to share knowledge on the topic.

		<i>[them] grow as a trainer, as a facilitator and as an advisor. I think that has been the biggest thing is that [LPAs are] supported by [their] manager[s] to go out and get additional training or request additional training to further [their] careers and personal development” (Prac4)</i>	
LPAs pursue continuous learning  [EoP outcome]	<p>Following the completion of the CASP thesis, LPAs in the West region of CATSA (now the Prairies and Pacific) went through the pilot certification process and were certified by the CSTD to attain their CTP/CTDP designation (Doc1, Prac4, Prac8, Prac10). An LPA from another region of CATSA at the time also pursued this designation on their own accord (Doc1). The continuous learning of LPAs was a natural progression from expecting screening officers to continuously undergo improvement from learning (Prac13, Prac15). LPAs applied the skills learned through the certification process in their own delivery of training (Prac4). LPAs that became certified are required to complete yearly continuous learning to maintain the certification (Doc1). LPAs also have to complete a yearly learning plan with their performance management review to maintain their credibility and support them in pursuing continuous learning which is reinforced by CATSA (e.g., seminars and workshops) (Prac10, Prac16). CATSA provides the means for LPAs to be successful candidates and ensure they do their job to the best of their ability by having managers that set them up for success, or by offering professional development opportunities (Prac16). CATSA is also noted to re-enroll the LPAs who obtained their certification to ensure that they remain certified (Prac4). Some LPAs have also pursued continuous learning in the form of university courses (Prac4, Prac16). Continuous learning for LPAs is now part of the organizational culture with the CASP having instilled a continuous learning piece (Prac4, Res2). The pilot certification program that arose from the CASP provided some LPAs with the motivation and self-esteem to continue to develop and achieve within their roles (Prac6).</p> <p>However, some suggest that the implementation of the pilot certification program was challenging due to there not being full commitment from all LPAs (some LPAs had mixed feelings on assessment and certification) (Prac12, Res2). Obstacles to continuous learning for LPAs were also discussed including time in initially completing and maintaining CTDP status (Prac4).</p>	<p>“Following the completion of [the CASP] thesis, the LPAs in the West (now Prairies and Pacific region) went through a certification process and were certified by CSTD, to attain their Certified Training and Development Professional (CTDP) designation. Some of those LPAs are still with CATSA and still have the designation. An LPA from Halifax later achieved his designation as well.” (Doc1)</p> <p>“The LPAs that became certified continue to complete continuous learning activities every year to maintain their certification” (Doc1)</p> <p>“[CATSA] support the additional training that [LPAs] do, courses or additional pieces that [LPAs] need for the betterment of [their] careers [...] every year [LPAs] have a learning plan with [their] performance management review that [are] fill[ed] out [with] what pieces [they] are going to complete in the coming year to better [their] role [and] things that would help [LPAs] to do the job that [they] do” (Prac10)</p> <p>“I know this was difficult to implement in [CATSA]. Even when people were doing it there wasn’t necessarily full commitment by LPAs to do it. Some did and some didn’t [...] Some were very eager to do it and thought it was a good thing, others were a little more hesitant” (Prac12)</p> <p>“[CATSA] expect screening officers themselves to continuously undergo improvement from learning etc., and [the CTP] was a way to mimic that for LPAs and say you also have to undergo continuous learning” (Prac13)</p> <p>“CATSA themselves offer a lot of workshops, programs or courses that will help [LPAs] or assist [LPAs] in [their] growth in the company [...] [some LPAs] do take courses whether it is at Mount Royal or the university or other places that offer certain courses” (Prac16)</p> <p>“[The] immediate manager ensured that [the LPA] was set up for success [...] CATSA do provide all [the resources] so that [LPAs] do become successful candidates who are able to ensure that the material that is being taught is right” (Prac16)</p>	<p><b>H</b>  <b>Realized, clear project contribution</b>  The CASP contributed to a shift in organizational culture around the LPA and instilled a continuous learning piece with LPAs now pursuing continuous learning in a variety of formats to uphold their standards.</p>

		<p><i>“The learning [through the CTP] at that time [LPAs] tried to apply it to the different courses that [CATSA] have” (Prac4)</i></p> <p><i>“Every year CATSA re-enrolls [certified LPAs] into membership into the learning institute, so CATSA supports [LPAs] yearly continuous education plans” (Prac4)</i></p> <p><i>“Trying to find that time where [LPAs] can be dedicated to become certified as a practitioner, I think that is one of the biggest obstacles there [...] it is still trying to find the time to keep up [the] certification piece, I think that is always one of the biggest challenges” (Prac4)</i></p> <p><i>“Exactly [continuous learning is part of the culture] [...] there is always the opportunity to be supported if [LPAs] want to learn something or if [they] want to attend a conference” (Prac4)</i></p> <p><i>“The assessment and certification program, gave [LPAs] even more I would say motivation, and second assurance that they can, the self-esteem, that they can provide and contribute to CATSA’s training program” (Prac6)</i></p> <p><i>“The [CASP] findings were well received – the LPAs in the West were happy with the process. An LPA in the East found out about what they had proposed and completed the training (on their own) with CSTD and received certification. However, there may have been mixed feelings depending on how individuals feel about assessment and certification” (Res2)</i></p> <p><i>“[The CASP] instilled continuous learning piece. Now that LPAs are training managers and assessing supervisors, this has escalated their role and set them up for success” (Res2)</i></p>	
<p>CATSA pilot participants (LPAs) gain knowledge of adult learning</p> <p>[high-level outcome]</p>	<p>Through the process of preparing to complete the pilot certification, LPAs gained knowledge of adult learning (Prac10). The CASP and PI also supported LPAs in learning new pieces of information around adult learning theory that they would have not known without going through the certification process (Prac10). Completing the certification process supported LPAs in gaining a knowledge of adult learning by providing the opportunity to immerse themselves in relevant literature on learning theories in preparation for their certification which some LPAs took away and used within their daily roles (Prac8). This knowledge of adult learning gained through the certification process grounded theory within the daily work of the LPA and provided LPAs with increased confidence and professional capacity (Prac8). LPAs are now more proficient in adult learning theory and are viewed as a professional group who are improved</p>	<p><i>“[LPAs gained knowledge of adult learning] because to prepare for the certification [LPAs] read a lot of material and had to go through that process [themselves], so definitely it was absolutely beneficial” (Prac10)</i></p> <p><i>“[The CASP] helped [LPAs] as instructor[s], and [LPAs] definitely learned pieces that [they] didn’t know prior to that and wouldn’t have known had [they] not gone through that process” (Prac10)</i></p> <p><i>“Absolutely [LPAs that went through the assessment have increased knowledge of adult learning] [...] when [LPAs] were going through it a couple of them said oh, I was reading this and that is what I do every day and there is actually a name for it! So that was probably the biggest thing is when they first approached the certification, they were a little worried about it and then as they went through it realizing that this is what [LPAs] do every day but</i></p>	<p><b>M</b></p> <p><b>Realized, clear project contribution</b></p> <p>The CASP and pilot certification processes allowed LPAs to gain knowledge of adult learning and apply this in their daily role.</p>



	collaborators since the increased focus on professional development instilled by the CASP (Prac9).	<p><i>when [they] can use that common vocabulary it puts concrete that what [they are] doing is correct, this is proven that it works” (Prac8)</i></p> <p><i>“Since [the CASP], [LPAs have] become much better educated, more, and it is a hard thing to describe if you are not in the industry, but they are much more proficient at adult learning theory from my perspective. However, before it was the basics that anyone who has a basic interest in teaching would have. But I think now they are truly a professional group. Their feedback, their approach, they’re excellent” (Prac9)</i></p> <p><i>“[LPAs] seem much more aware of more academic theories of adult learning than they were before which I think has driven them to be a better group to work with” (Prac9)</i></p>	
<p>LPAs acquire CTPs/CTDPs</p> <p>[high-level outcome]</p>	<p>Six LPAs went through the certification process following the completion of the CASP to achieve their CTP/CTDP designation (Doc1, Prac10). Some of these LPAs remain working at CATSA (Doc1, Prac10). CATSA completed a pilot of the LPA certification process in partnership with the CSTD and remained in contact with LPAs who went through the process to gather their feedback on areas of improvement (Res2). LPAs who were the first to go through the certification process discussed how it was exciting and subsequently supported them in maintaining a level of consistency and professionalism within their role (Prac10). LPAs who completed the certification have advanced within their roles, and there is noted to be a difference between the certified LPAs who are more consistent and on the same page, and non-certified LPAs (Prac8). CATSA supported the certification process and LPAs gaining their CTPs/CTDPs through paying for the courses for LPAs to maintain their designation (Prac6). Full credit is given by informants to the CASP and PI for the introduction of the LPA assessment process to CATSA and encouraging LPAs to become qualified from the CSTD (Prac8).</p> <p>However, not all LPAs acquired CTPs/CTDPs as it is not a mandatory process within CATSA (Prac5, Prac10, Prac12). Implementing the assessment process throughout CATSA was challenging as some LPAs were not fully committed to the initiative which resulted in not all LPAs becoming certified (Prac12). Informants also discussed how the program created by the CASP ended due to the DRAP and organizational restructuring which also prevented all LPAs from being able to become designated (Prac5, Prac13).</p>	<p>“Following the completion of [the CASP] thesis the LPAs in the West (now Prairies and Pacific region) went through a certification process and were certified by CSTD, to attain their Certified Training and Development Professional (CTDP) designation. Some of those LPAs are still with CATSA and still have the designation. An LPA from Halifax later achieved his designation as well.” (Doc1)</p> <p><i>“[The certification process] was kind of exciting, it was a big deal! So that was a big piece towards trying to give [LPAs] those extra pieces to help [LPAs] in the role of instructor or facilitator” (Prac10)</i></p> <p><i>“[LPAs] had [the] written exam that [they] had to do and the practical piece” (Prac10)</i></p> <p><i>“And not everyone is [certified] even today, I don’t think everyone went through the process” (Prac10)</i></p> <p><i>“[The certification process] was difficult to implement in [CATSA]. Even when people were doing it there wasn’t necessarily full commitment by LPAs to do it. Some did and some didn’t before it all wound up. Some were very eager to do it and thought it was a good thing, others were a little more hesitant” (Prac12)</i></p> <p><i>“[There are LPAs] who didn’t end up taking the program just because it was essentially cancelled before they were able to, but I know that for example [sic] wanted to do it, but it just wasn’t available anymore” (Prac13)</i></p> <p><i>“There are some [LPAs] who have a designation, the certified training professional, but that is not mandated through CATSA” (Prac5)</i></p>	<p><b>H</b></p> <p><b>Partially realized, clear project contribution</b></p> <p>Six LPAs acquired their CTP/CTDP designation as a result of the CASP, but the designation is not mandatory or acquired by all LPAs.</p>

		<p><i>“There was a time where the LPAs were asked to take the CTP and then very quickly thereafter, I think the following year everything was stopped because [CATSA] had to downsize. There was a deficit reduction action plan that happened, and [CATSA] ended up having to cut all kinds of things and positions as well as training, and that never came back” (Prac5)</i></p> <p><i>“[The PI] was definitely the leader in that [...] just to have a pilot project and CATSA investing in the designation, paying for the designation for the 6 or 7 LPAs and potentially paying for the courses to keep up their designation is a huge testimony of [the PI’s] contribution” (Prac6)</i></p> <p><i>“It was amazing to watch the advancement of the LPAs through the program. So, when [the PI] started the program to get [LPAs] certified, at that time LPAs came from a range of backgrounds and it was something to get all [LPAs] on the same page and take [them] forward, and it definitely did that [...] [sic] have noticed a huge difference in the LPAs who have gone through the certification program compared to the ones that haven’t” (Prac8)</i></p> <p><i>“[The PI] really pushed [the] LPAs to get into the Canadian society of training and development certification” (Prac8)</i></p> <p><i>“CATSA completed a pilot of LPA certification which communicated the findings to the wider organization. The LPA’s that completed this pilot were involved in constant communication to gather feedback on the process. CATSA partnered with the Canadian Society for Training and Development (CSTD) to implement this pilot. The restructuring took place shortly after the end of the pilot” (Res2)</i></p>	
<p>LPAs have improved confidence and professional capacity</p> <p>[high-level outcome]</p>	<p>The CASP provided a professional development opportunity for LPAs to increase their confidence (Doc2, Prac10). For example, notes from project documentation discussed the benefits of the certification program in increasing the self-efficacy and creating confidence amongst LPAs (Doc2). Other benefits listed included self-respect, empowered mind, increased self-esteem, pride, and being recognized as a professional (Doc2). Informants discussed how the CASP and certification led to the increased performance of LPAs who have grown as trainers, facilitators, and advisors (Prac4). LPAs are now recognized as valid trainers with improved competencies due to being certified by an external certification body to help CATSA deliver effective security (Prac6). This has led to screening officers feeling much more at ease when they first begin operations (Prac9). On an individual level, the certification process provided LPAs with designations</p>	<p>“The study also provided a professional development opportunity for LPAs” (Doc2)</p> <p>“A majority of world café report outs and notes mentioned that a benefit to the certification program would be an increase in self-efficacy by creating confidence and showcasing skills. Some of the benefits listed were self-respect, empower mind, increase self-esteem, pride, and being recognized as a professional” (Doc2)</p> <p>“Yes, I would say [LPAs have improved confidence and professional capacity], the ones that have gone through the [certification] process” (Prac10)</p> <p>“A lot of what [LPAs] have learnt over the years really started off the certification piece, and that helped [LPAs to] grow as a trainer, as a facilitator and as an advisor [...] The biggest</p>	<p><b>H Realized, clear project contribution</b></p> <p>The certification and CASP process allowed LPAs to have improved confidence and professional capacity by making them aware of their skills, increasing their competency with an external</p>

	<p>to self-promote their future careers both inside and outside of CATSA which afforded LPAs with the drive and curiosity to maintain the designation (Prac6). The certification program provided LPAs with the confidence in their roles and their knowledge of the job in order to communicate professionally and confidently (Prac8, Prac9). It impacted professionalism within the LPA group and enhanced their skillset to enable the group to become a significant force in supporting the efficiency of operations and support the development of screening officers (Prac9). For example, LPAs have become more involved in the creation and improvement of materials, are fairer and more competent in the classroom, and are more confident with skills and knowledge which provides them with enhanced credibility (Prac9). LPAs are now viewed highly by all parties as there is an awareness that they are certified and there is a rigorous external program that leads to their continuous employment (Prac9). LPAs are also noted to have become more collaborative both internally with CATSA, and externally with service contractors to achieve continuous improvement on an ongoing basis (Prac9). The CASP and certification program opened a door for LPAs to improve their subject matter expertise and consistency, and progress into teaching, creating a sense of professional accomplishment (Res2). LPAs are now viewed as a truly professional group (Prac9).</p>	<p><i>contribution has been the increase of the performance of LPAs to set a higher standard” (Prac4)</i></p> <p><i>“The recognition, the validity of [CATSA] trainers, their competencies, to me that was the biggest point that should be the big sales pitch. In other words, in front of other government departments, in front of police forces, all the stakeholders [CATSA] work with, airport authorities, when [CATSA] say [their] trainers are certified by an independent learning body that certifies trainers with certain competencies that help [the organization] provide the best training for the security function [...] On a more personal basis for the LPAs, being certified, having a designation in terms of self-promotion for careers, be it inside of CATSA or outside of CATSA, [LPAs] had a recognition, [LPAs] had something that is [theirs], [they] have to keep it up through continuous learning. It provides for self-motivation to keep up [the] designation, but also [their] curiosity” (Prac6)</i></p> <p><i>“The assessment and certification program gave [LPAs] even more motivation, and second assurance that they can, the self-esteem, that they can provide and contribute to CATSA’s training program [...] the self-esteem was higher predominantly and therefore they were better contributors to improve the program” (Prac6)</i></p> <p><i>“[The certification program] gave a concrete stamp on what [LPAs] do daily, because [they are] qualified and certified and [they] certify others, it made It more concrete [...] it gave [LPAs] the ability to say [they] know what [they are] doing, or confidence to say that” (Prac8)</i></p> <p><i>“[The PI] led a project where [LPAs] became certified training development professionals and I think that significantly impacted the professionalism within the group [...] [LPAs] are much improved in terms of their professional skillset [...] Since [the certification program], [LPAs are] a significant force for improving screening operations and they’ve also become much better evaluators of initial skills development within our screening officers. Before I think they were, maybe it is an improper term, scattershot in their approach, now there is a defined program that is also enhanced by the fact that they now have these skills that they were lacking before” (Prac9)</i></p> <p><i>“[LPAs] have become much more involved in the creation and improvement of materials, both in terms of continuous learning initiatives of the contractors take and push forward with the screening officers and the managers. [LPAs] are far more</i></p>	<p>certification process, and increasing their motivation for continuous learning and development.</p>
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<p>LPA role becomes more integrated on training and assessment</p> <p>[high-level outcome]</p>	<p>Although the LPA role has always focused on training and assessment to some extent, the role has become more detailed due to evolving threats to airport security and changes in new technology (Prac1). LPAs need to be adaptable and adjust quickly due to the dynamic nature of airport security, changing regulations and operational requirements (Prac1). The LPA role has become more responsible due to the larger workforce that needs training and the increased number of functions and certifications that screening officers must now go through (Prac2). The LPA role has also increased in responsibility with the need for LPAs to “know everything”, which has resulted in the role becoming more integrated on training and assessment</p>	<p><i>“The variety, the scope of the training has expanded over the last number of years because as [CATSA] employ different technologies [LPAs] have to be ahead and aware of that and be able to deliver. The non-passenger screening part of it is relatively new in the framework of airports, so that is something else that [LPAs] have to keep ahead of. So, it’s basically that [LPAs] have to be very adaptable and be able to adjust quite quickly because it is quite a dynamic business and there’s always elements that are changing by regulation or by demand or by operational requirement [...] the LPAs have to be able to handle that, they need</i></p>	<p><b>M Realized, clear project contribution</b></p> <p>With the expansion of responsibility due to changing technology and increase in staff numbers, lower-risk training has been delegated to</p>



	<p>(Prac2). The training and assessment of LPAs is also noted to have increased in terms of quality and has evolved with the organization (Prac1).</p>	<p><i>to have the capacity to be able to work quickly and effectively and be able to engage with the screeners” (Prac1)</i></p> <p><i>“Depending on the timing and the history of [CATSA], things always vary in terms of the regularity or the frequency of the assessment, but it always has been part to a degree. [LPA assessment] has become a lot more sophisticated in terms of detail and level of detail [...] if I compare when [sic] started at the organization, some of the personnel that were in training, the LPAs, compared to what [CATSA] have now, it is quite a significant difference in terms of quality. So, obviously it has matured, and it has evolved” (Prac1)</i></p> <p><i>“[LPAs] have become responsible for so much more because [CATSA] went from a workforce of about 400 people, and those 400 people they can pretty much do anything and everything because there wasn’t too much required extra of them, now [CATSA has] added so many different functions and different certifications [...] [LPAs] just have to know absolutely everything, they have now had to branch out into so many more areas and be responsible for that” (Prac2)</i></p>	<p>SCTR’s resulting in the LPA role becoming more integrated on training and assessment.</p>
<p>LPA role evolves to focus on the training of trainers</p> <p>[high-level outcome]</p>	<p>LPAs work closely with service providers to train the trainers (Prac10). Some suggested that following the CASP, LPAs are now focusing on the oversight of trainers to ensure consistency in what the trainers are delivering (Prac11, Prac15). The LPA role has evolved from recertifying screening officers in a face-to-face assessment which was time consuming, to a more computer-based assessment and more focused on the training of the trainers (Prac12). Service contractors have taken on a greater responsibility to ensure that training specialists (SCTRs) are successful within their roles (Prac15). This delegation of the lower risk training to third party screening contractors has led to LPAs focusing on training the trainers (e.g., SCTRs) and handing off the lower-risk training to SCTRs (Prac15). The feedback to SCTR performance from LPA’s has supported SCTR’s in guiding problem solving and has been highly valuable (personal communication).</p>	<p><i>“[LPAs are] always evolving, there’s always new things to learn and ways that [LPAs] can change how [they] are doing things to make it better [...] [LPAs] do train the trainer all the time with the service provider” (Prac10)</i></p> <p><i>“Yeah [there is a more hands-on approach], [LPAs] do more oversight, they do oversight now, they didn’t do that before, oversight of the trainers to make sure that the trainers are delivering what they are supposed to do. To make sure there’s consistency on what the trainers are delivering” (Prac11)</i></p> <p><i>“LPAs used to recertify screening officers in a face-to-face assessment and that took up a lot of the LPAs time, but that has been moved off into a more computer-based assessment to look at the x-ray and the knowledge, and more observation of people working on the live line as opposed to people working in an assessment environment. There’s a lot less of that, they used to do a lot more of that, but they do definitely do a lot more training of the trainers” (Prac12)</i></p> <p><i>“[The LPA role] has evolved quite a bit like with the SCTRs. Previously, [LPAs] had a lot more, a lot bigger role in actually training [the] training specialists and being the ones to sign them off for each piece [...] now with the instruction of SCTR qualifications, basically [the service contractors will] prepare staff to become training specialists, they go through a course with the</i></p>	<p><b>M</b></p> <p><b>Realized, unclear project contribution</b></p> <p>Much lower-risk training has been signed off to SCTRs with LPAs now taking a more leading role on the oversight of trainers to deliver consistent training.</p>

		<p><i>LPAs, the LPA signs them off [...] then it goes back and it is on [the service contractor] to make sure that [the] training specialists, [the] SCTR's are successful in their role for each individual [...] it used to be [LPAs] oversaw, each time something got rolled out [LPAs] had to sign the individuals off, now it's really just if there's a new piece of technology that the LPAs will sign [the] training specialists off after the initial onboarding" (Prac15)</i></p> <p><i>"[CATSA] have been delegating a lot of [the] lesser or lower risk training to [the] third party contractors [...] [CATSA] are delegating more to [the] SCTR's [...] so the LPAs now have to sign off, they essentially do train the trainers for these SCTR's and hand off some of the lower risk training to them" (Prac5)</i></p>	
<b>Professional Development Pathway</b>			
<p>PI's professional development is enhanced by research experiences</p> <p>[intermediate outcome]</p>	<p>The CASP provided the PI with the opportunity to grow their leadership capacity and learn important lessons that could be utilized within their future work both professionally and personally (Doc2). For example, the PI developed an understanding of the scope and value of qualitative research, the challenges of being a researcher within their own workplace, the importance in having the correct people on the research team, and the value of stakeholders in participating fully in an action research initiative (Doc2). The PI became further aware of the benefit of training and certification and has developed a value for continuous learning (personal communication). The PI also lead the pilot certification process (personal communication). The opportunity to complete a research project in their own organization provided the PI with a number of challenges (including the need to separate the research from their managerial position) and provided them with the advantage of implementing the CASP, observing the progress, and experiencing the results of the project in future stages (Doc2). The PI also faced unexpected lessons such as discovering the bias they were previously unaware of and the value of asking questions in an appreciative framework, planning extensively, and reflecting throughout the research process to ensure successful implementation of the initiative (Doc2). The PI enhanced their professional development through the research experience by learning the value of understanding different perspectives in advance and the need to have buy-in from decision-makers (Res2).</p>	<p>"[The CASP] has been an excellent opportunity for [the PI] to grow [their] leadership capacity and learn some important lessons" (Doc2)</p> <p>"The experiences of [the CASP] have been very valuable, and [the PI] will be utilizing this new knowledge both professionally and personally for many years to come" (Doc2)</p> <p>"[The PI] now understand[s] the scope and value of qualitative research and what can be discovered from both participants and the organizational context and needs. [The PI] can personally attest to the challenges of being a researcher in [their] own workplace. [The PI] fully experienced how important it is to have the correct people on [their] team during a research project and [the PI] ha[s] learned the value of having all the relevant stakeholders participating fully in an action research initiative" (Doc2)</p> <p>"[The PI] had been told that [they] had to be very mindful of the hat [they were] wearing for research and [their] hat as a manager. The most difficult challenge was ensuring that [the PI] did not move assumed knowledge as a manager into the research project [...] it is a challenge to complete the project in your own workplace, although there are benefits. [The PI] now ha[s] the advantage of implementing the project, observing the progress, and experiencing the results of the project in future stages" (Doc2)</p> <p>"[The PI] also had a few unexpected lessons during the project. [The PI] discovered a bias that [they] had and was unaware of previously. [The PI] observed the value of asking questions in an appreciative frame and [the PI] gained new insight into the value of planning extensively and reflecting throughout the process prior to implementation" (Doc2)</p>	<p><b>H</b></p> <p><b>Realized, clear project contribution</b></p> <p>The PI learnt a number of valuable skills through the CASP process which enhanced their professional development within their professional and personal roles.</p>

		<p><i>“The way [the PI] drew [their] conclusions in terms of the benefits and the challenges and [the PI’s] own learning [...] [the PI] was afraid of [their] bias for sure, [the PI] was afraid that [they] would conduct the world cafés with too much in [their] role as a manager, and [the PI] was very mindful of that” (Prac6)</i></p> <p><i>“Doing the literature review ahead of time to understand the different perspectives and knowing the fear or some of the hang-ups that people might have going in was helpful [...] the pieces around doing even the interviews with key people to make sure that you have the buy-in with decision makers is important” (personal communication)</i></p>	
<p>PI continues using methods learned at RRU (e.g., appreciative inquiry, action research, and experiential learning)</p> <p>[EoP outcome]</p>	<p>The PI continues to use methods learned at RRU in their daily work more frequently than originally expected (personal communication). The MAL experience is noted to have been very valuable for the PI who continues to utilize methods learnt within their work at CATSA (Doc2). For example, the PI continues to use action research as a method for organizational change as the participation by stakeholders is a valuable tool to ensure a wide variety of viewpoints are captured and to ensure support for proposed initiatives (Doc2). The PI has also continued to use methods of formulating World Café questions learned at RRU in their current work due to the effectiveness of the process established in the CASP (Doc2). The PI now approaches tasks with the “plan, act, observe, reflect” outlook learned at RRU, and reiterated the value of pilots in improving organizational change (Res2). The World Café method is also used throughout CATSA and has been adopted by some service contractors (Res2).</p>	<p><i>“I have used my learning much more than I anticipated. Action research fits well into my role and organization. As I am responsible for continuous improvement in my region it is a tool I use frequently” (personal communication)</i></p> <p><i>“The experiences of this project have been very valuable, and [the PI] will be utilizing this new knowledge both professionally and personally for many years to come” (Doc20)</i></p> <p><i>“Action research is a method [the PI] would use again in an organizational change initiative as the participation by stakeholders was a valuable tool to ensure all viewpoints are considered and initiate project support” (Doc2)</i></p> <p><i>“[The PI] created the [World Café] questions from an appreciative perspective, based on the findings and themes from the earlier interviews [...] [the PI] would use this way of formulating world café questions in the future, as it proved to be quite successful” (Doc2)</i></p> <p><i>“[The PI] anticipated at the beginning of the project that [they] would only use the action research process once—to achieve [their] degree; then [they] would return to previous mental models and procedures for working through projects. [The PI has] been surprised at how much value [they] realized from the processes and how much more thorough and encompassing the strategies for LPA certification are as a result. [The PI] expects to use the action research process again, as well as a variety of the research methods as facilitation and information gathering tools” (Doc2)</i></p> <p><i>“[The PI] has used action research a lot throughout the last 10 years within CATSA in adapting and evolving the organization. The world café is also used within CATSA. [The PI] now approaches things with the ‘plan, act, observe, reflect’ outlook,</i></p>	<p><b>H</b> <b>Realized, clear project contribution</b> The PI continues to use methods learned at RRU in their day-to-day work to support continuous learning.</p>

		<i>and values pilots in reflecting on what's changed, adapting, and releasing an improved version" (Res2)</i>	
<p>PI pursues continuous learning and training to apply in practice to set up people for success</p> <p>[EoP outcome]</p>	<p>Informants discussed how the PI had set LPAs up for success which enabled LPAs to perform to the best of their ability and support those they are training (initiating a spillover effect which let LPAs set up screening officers for success) (Prac16). The PI is passionate about their role and is supportive of LPAs in finding answers to challenges (Prac16). The PI has been a deciding factor in some CATSA staff continuing to work in their positions and expand within their careers in airport security (Prac16). The PI has used their continuous learning to coach and mentor other CATSA staff to support success at various levels of the organization (Prac16). Other informants suggested that they would not have been as successful in their roles without the support of the PI due to the PI's knowledge, experience, professional approach, and credibility (Prac9). The PI continues to participate in continuous learning and training by reading up on the latest academic works which have informed the practices of LPAs (Prac9).</p>	<p><i>"[LPAs] want to set [screening officers] up for success, [LPAs] need to have that person that is willing to set [them] up so that [they] can set them up [...] if [LPAs] had a manager that wasn't really there, that was setting [them] up for failure then it would not be a good thing [...] they need that support system" (Prac16)</i></p> <p><i>"If a screening officer [is] struggling that's something that if [LPAs] take that back and give that [to the PI], [the PI] is going to find an answer, [the PI] will find a way because [the PI] knows it's important and is there to support [LPAs] [...] [the PI] is very passionate [...] [the PI] will put [their] 150% to ensure that it is going to go right [...] [the PI] was a deciding factor [of employment] because [sic] knew that [the PI] was going to be [the] manager [...] [the PI] wouldn't set [LPAs] up for failure" (Prac16)</i></p> <p><i>"[The PI] has coached and mentored [LPAs which] really helped" (Prac16)</i></p> <p><i>"[Some LPAs] would be as successful in what [they] do if [the PI] was not around. [The PI] brings a great deal of knowledge, a wealth of experience and a welcomed approach and a credibility that you just don't find in many places. I know for a fact [the PI] is always reading up on the latest techniques, the latest academic works and I can't say enough about what [the PI] has led in the region. A lot of [the PI's] practices have informed [LPAs] and [the PI] challenges [LPAs] to rethink what [they are] doing" (Prac9)</i></p>	<p><b>M</b> <b>Realized, clear project contribution</b> The PI pursues continuous learning through reading the latest academic works to set-up LPAs and other CATSA staff for success</p>
<p>PI continues in performance management at CATSA</p> <p>[high-level outcome]</p>	<p>The PI has continued in performance management at CATSA since the CASP and has been working on more developments to training and assessment for the organization nationally (Doc1). Informants discussed how the PI had continued work to implement some of the recommendations and approach to assessment and certification following the CASP, and is a leader on the topic at CATSA (Prac13). The PI also continues to test and pilot continuous learning approaches within their region to determine the transferability of approaches nationally. Through this method, the PI has led a lot of the changes that happen in performance management and training material at CATSA (Prac13, Prac16). The PI is also viewed as an expert in performance management at CATSA and is invested in ensuring that continuous learning is an integral part of organizational operations (Prac13, Prac15, Prac16). Informants suggested that CATSA relies on the PI's knowledge and expertise in terms of continuous learning, the LPA role, and the Learning and</p>	<p><i>"[The PI is] currently working on more changes to training and assessment for the organization nationally. [The PI is] leading the working group for this project and have members from all corporate branches taking part" (Doc1)</i></p> <p><i>"[The PI] is always the one who brings up the way things should be done or the ideal of looking at different solutions. And so one of [the PI's] things is every time [CATSA] bring the LPAs together there should be a continuous learning component to this, so I think in a lot of ways [the PI] has tried to implement maybe what the recommendations or [the PI's] approach for the assessment strategy [...] Normally [the PI] will trial these things in [their] own region and then propose them to see if this is something that [CATSA] can take on nationally" (Prac13)</i></p> <p><i>"[The PI is the main source of information on the topic of assessment and certification] [...] [CATSA] look to [the PI] as the</i></p>	<p><b>H</b> <b>Realized, clear project contribution</b> The PI has continued to work in performance management at CATSA focusing on continuous learning practices which has resulted in the PI's region leading the way nationally across the organization.</p>

	<p>Development Department (Prac16). Informants discussed how the clearest evidence of the PI's success was CATSA's decision to follow-up on the certification process for LPAs prior to the DRAP (Res1).</p> <p>The PI also continues to work closely with service contractors to support the sharing of continuous learning information, with service contractors discussing the good working and collaborative relationship they have with the PI (personal communication). The PI is noted as a significant and valuable colleague to work with (Prac9).</p>	<p><i>expert on this [...] [CATSA] consult with [the PI] every single time"</i> (Prac13)</p> <p><i>"[The PI] will give a lot of direction in terms of if [service contractors] are releasing a briefing, [the PI] will give that direction on what kind of tone the briefing should take, how much information [service contractors] should give to screening officers, how [service contractors] control the information [...] we have a good working relationship [...] that collaborative relationship that works really well"</i> (Prac15)</p> <p><i>"[The PI] leads a lot of the changes that happen within [CATSA]"</i> (Prac16)</p> <p><i>"[The PI] plays a big role in some of the changes that will be working in CATSA when it comes to training material [...] [the PI] is well invested in ensuring that things are going towards the better"</i> (Prac16)</p> <p><i>"CATSA does rely on [the PI's] knowledge and expertise and [the PI] does play a big role in the organization when it comes to the learning piece, the LPA role, and the learning department in Ottawa"</i> (Prac16)</p> <p><i>"[The fact that the PI] focuses on collaborative continuous improvement and making sure that everyone has those standards, and those common approaches is one of the reasons why this region continues to lead the country at this time in every single key performance indicator that is within our contract. [The PI] is a significant and valuable colleague to work with"</i> (Prac9)</p> <p><i>"The clearest evidence of [the PI's] success has been [CATSA's] decision to make following up on the certification process for the LPAs [the PI's] work for the foreseeable future"</i> (Res1)</p>	
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## Appendix 7. References

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