

Full name(s) of VIU faculty involved in the project and their Department(s): Dr. Leigh Blaney, PI, BSc Nursing; Eric Agyekum, Mathematics, Collaborator; Dr. Liesel Knack Director CIEL

Contact person email: leigh.blaney@viu.ca

Award: Explore Grant

Number of undergraduate student(s) involved: 2

Number of graduate student(s) involved: 0

Number of community partner(s) involved: 1 Partner: Langford Fire Rescue and 2 other collaborating Fire Rescue Services

Abstract for the project:

In British Columbia, there are approximately 14,000 firefighters of which nearly 10,000 or 71% are volunteer; it is imperative that the mental health needs of the volunteer sector is supported. Resilience is a contributor to mental health, and 'resiliency training' is currently being offered to professional firefighters in British Columbia; however volunteer firefighters are excluded from this training despite experiencing similar mental health risks. This project builds education from a resilience theory that was co-created with volunteer firefighters, and translates theory into practice.

Mental illness costs the workplace billions of dollars however there are gaps in the literature about the effectiveness of resilience training; this pilot project tests the effectiveness of education in measuring and improving resilience scores. Importantly, this project forms the foundation for resilience education for volunteer firefighters across the province, and although customized for firefighters, has utility for other emergency and healthcare providers.

The research team intends to provide customized resilience training & pretest-posttest the resilience scores of 100 firefighters from three fire rescue services (FRS) on Vancouver Island to assess the effectiveness of resilience education. Training will address core categories of resilience & offer evidence-informed strategies to build individual & collective resilience. The project will use mixed methods approaches: a qualitative questionnaire as well as validated scales (Wagnild & Young, 1993).

Beyond increased resilience scores & protecting & improving firefighters' mental health, the expected outcomes are:

1. Pre- and post-training pilot data demonstrating training effectiveness.
2. Pilot implementation of resilience training at Island Health & ultimately the VIU educational setting.
3. Build and strengthen the mental health capacity of firefighters.
4. Build capacity in student research trainees.
5. Pilot data to strengthen larger external grant applications.

2018 EXPLORE GRANT APPLICATION

This application for Explore Grant funds is to augment a Worksafe BC grant for a pilot project entitled ***Building resilience in volunteer firefighters: Bridging the research to practice gap***. The Explore Grant funds are aimed at supporting/mentoring student researchers (*research trainees*) in active and meaningful roles within the research project. Normally I would have applied for VIU Student Work-Op funds but I did not anticipate I would be successful with the Worksafe grant application (submitted Feb 9 & did not receive word until July 17) so missed the deadline for Work Op.

PROJECT DESCRIPTION

Problem, issue, opportunity

The World Health Organization (WHO, 2013) recognizes the health and financial impacts of psychological risks in the workplace and calls for psychosocial health programs in all workplaces. Nationally, the Mental Health Commission of Canada (MHCC) has developed the National Standard on Workplace Psychological Health (2013), with a focus on resilience in order to address the economic burden of mental illness at work. The MHCC asserts one-third of disability claims are related to mental health problems and mental illnesses but those claims actually account for about 70% of the total disability claim costs which is estimated to be \$15 to 33 billion Cdn (2013). Within the priority of Workplace Mental Health, one of the primary initiatives of the MHCC is the mental health of first responders and within this initiative the MHCC recognizes that resilience education can positively impact mental health (Mental Health Commission of Canada, 2018). The MHCC recognizes the unique culture and practices of first responders and asserts that it is imperative that programs, services, and tools are designed and delivered in recognition of these unique aspects. In order to meet the needs of the culture and context of first responders, the resilience model in this pilot project was created by and for firefighters (Blaney, 2017); the model serves as the foundation for resilience education targeted specifically for first responders.

Resilience is a contributor to mental health and resilience education is aimed at positively impacting workplace health. However there are gaps in the literature about the effectiveness of resilience training; this pilot project tests the effectiveness of education in measuring and improving resilience scores. As well, organizations have created mental health education programs such as *Resilient Minds*, the Vancouver Fire Rescue Service partnership with the Canadian Mental Health Association and WorkSafeBC. However rather than resilience as the core concept or heart of education, the focus of this, and other, workplace programs currently is on the risks, identification, management, and de-stigmatization of mental illness; these are key components for decreasing stigma but there is no published evidence these programs build resilience. Also, Resilient Minds is being offered to professional firefighters in British Columbia but volunteer firefighters are excluded from the training despite experiencing similar mental health risks; since volunteer firefighters comprise 71% of British Columbia's firefighting workforce, it is imperative that the mental health needs of the volunteer sector is supported.

This application supports the aims of the Explore Grant by allowing at least two students to actively participate in research in meaningful ways and to be mentored by seasoned researchers. It also supports the PI to explore an area of interest and builds on the PI's previous research on resilience by linking it tangibly to VIU and increasing the capacity of VIU researchers in working in diverse teams and with community partners. The project builds education from a resilience theory that was co-created with volunteer firefighters, and translates theory into practice. Importantly, this project forms the foundation for resilience education for volunteer firefighters across the province, and although customized for firefighters, has utility for other emergency and healthcare providers. The project's

innovation is its genesis in a definition, theory, and model of resilience that was co-created with firefighters and is now being applied to the 'real world' of volunteer firefighters.

Literature to support the approach

Globally, volunteer firefighters comprise the majority of fire rescue personnel. In British Columbia alone, there are approximately 14,000 firefighters of which nearly 10,000 or 71% are volunteer yet there is limited focus (funding, education, etc.) to support the mental health of volunteer firefighters. In the popular media (see for example: Luymes, 2016), the FRS is considered to be a 'high risk' occupation, one that carries significant risk of physical and/or psychological sequelae to the job (see for example: BC Firefighters Association, 1999; Haynes & Molis, 2015; Hill & Brunnsden, 2003). Previous research on the mental health of firefighters has primarily focused on the 'illness' outcomes such as post-traumatic stress disorder (PTSD) (see for example: Bryant & Harvey, 1995; Haslam & Mallon, 2003). However, firefighters have a reasonably low incidence of PTSD relative to other emergency service providers such as police and paramedics (see for example: Alexander, 2015; Del Ben et al., 2006; Halpern et al., 2008; Haslam & Mallon, 2003); there is scant research related to the how and why of this phenomenon, nor into the role of resilience in adult, high-risk populations. Although the emphasis of research is shifting from what makes people ill to what keeps them well, there is currently a paucity of literature about surviving and thriving in the face of adversity. Resilience is a key factor in post-traumatic processes (Bonanno, 2004; Tedeschi & Blevins, 2017) but there is limited research into resilience in firefighters and an absence of research into resilience in volunteer firefighters. As well, there is little research into resilience education and/or its effectiveness (Robertson et al, 2015; Sarkar & Fletcher, 2017). This study aims to begin to address these gaps.

Methods & timeline

Ethics approval has been granted (Oct 9, 2018) from the Vancouver Island University Research Ethics Board and the Island Health Ethics Board.

A cross sectional, mixed methods study design will be used. Pre- & post-education assessment tools include the Resilience Scale (Wagnild & Young, 1993) and MacEwen's Resilience at Work (R@W) scale (Winwood et al., 2013). A narrative questionnaire adapted from a stress and coping questionnaire created by principal investigator (PI) (Blaney, 2003) and used in previous research with firefighters (Blaney & Brunnsden, 2015) will be used to gather qualitative and demographic data. Adaptations to the narrative questionnaire include questions to assess firefighters' experiences and perspectives on coping with work-related stressors, definitions of resilience, and perspectives on building resilience; the questionnaire has been renamed to reflect the focus on resilience (Resilience Questionnaire or RQ). The demographic information collected on the RQ will also allow examination of possible correlating factors such as age, experience, role, etc. with resilience perspectives of participants. Both the Resilience Scale and the R@W scale have been tested and validated across a variety of populations.

Educational content: There are significant gaps in the literature however there are recommendations for resilience education research. Robertson et al. (2015) and Sarkar & Fletcher (2017) state that research into effectiveness of resilience education require two foundational components: a clear definition of resilience in the context of the population under study, and tools that are measures of resilience as opposed to those that measure states (such presence/absence of mental illness), traits (such as personality traits of neuroticism), morale (optimism), productivity (performance outcomes), etc. (Robertson et al., 2015). This study addresses both of these recommendations.

Participants: The researchers in this study will provide customized resilience training and pretest-posttest the resilience scores of 100 firefighters from three fire rescue services (FRS) on Vancouver Island to assess the effectiveness of resilience education. All personnel in the department, regardless of rank

or role, are eligible to participate in the education&/or the research. This convenience sample for the pilot is FRS who have previously expressed interest in participating in health research; each FRS has 30-35 members. The FRS are within 150 km of the research team's worksite, allowing for reasonably easy access to participants.

A two-pronged qualitative and quantitative approach allows for rich exploration of the dynamism and heterogeneity of resilience responses which, in turn, require innovative education methods that reflect current understandings of adult pedagogy and learners. The PI brings over 20 years' experience with curriculum design, delivery, and evaluation with adult learners and, in collaboration with other members of the research team will design the customized resilience education programme.

The training officers in each FRS will be recruited to establish a 'master list' of firefighters/participants; participants will be assigned numeric codes to match each firefighter with numbered packages of questionnaires and the research team will receive only the numbered questionnaires and will not have access to the master list. The master list is necessary in order to ensure match between each participant and data to each pre- and post-test questionnaire particularly at 2-month post-education.

The research trainees will be responsible for collecting the pre-test questionnaires and ensuring that each has a signed consent attached. The consents will then be torn off the questionnaire, matched with the alphanumeric code and noted to be signed or unsigned, and filed in a secure setting. Following the education session, the trainees will collect the post-education questionnaire package, match them with the pre-test alphanumeric code, and secure the completed questionnaires for the PI to begin data analysis. The consent will also be attached to the 2-month post-test and the research trainees will also detach those prior to giving the raw data to the PI.

The questionnaire packages will contain the following:

- Pre-test package: Consent, Resilience Questionnaire (RQ), Resilience Scale (RS), Resilience at Work (R@W) scale;
- Post-test immediately following training: RQ, RS, R@W, course evaluation
- Post-test 2-months: Consent, RQ, RS, R@W

Raw data will be transcribed/coded/handled by the PI. The PI will do a thematic analysis of the RQ; the themes will be validated initially by the Co-lead and research trainees, and then by the research users/project advisory group.

Data Analysis

Data from the RS and the R@W will be coded by the PI onto either an Excel spreadsheet or directly into SPSS, and forwarded to the statistician for analysis of pre-and post training scores. The PI will combine themes and outcomes with information from the literature and integrate those into recommendations that will answer the research questions. The recommendations will be presented by the research team at a face-to-face meeting with the research users for discussion and evaluation. This group will provide additional validation by functioning as a quasi-focus group, providing data through discussion of themes and recommendations; the research users will have no access to raw data. All information gathered in the course of this project will be coded for privacy and any individual identifying data will be removed from survey responses by the research assistants prior to the PI and co-lead having access to the data.

The resilience training programme is in development; principles of teaching/learning including 'team-based learning' are being incorporated into the process. The curriculum is based on current resilience research and resilience education research (see for example Robertson et al, 2015; Sarkar & Fletcher, 2017) and integrates a novel definition and theory of resilience (Blaney, 2017). Learning outcomes have been developed, and questions about the curriculum/course content and delivery will be

assessed in a 'course evaluation' form following delivery of the education session. The course will be interactive, and there will be handouts to 'take away' for future reference and for inclusion in the organization's psychological health materials/future training. The pre-test/post-test tools are a qualitative measure of firefighters' resilience (the RQ) as well as two tools that quantitatively measure resilience scores (RS and R@W) as recommended by recent literature (Sarkar & Fletcher, 2017).

Project Workplan – Building resilience in volunteer firefighters: Bridging the research to practice gap

Key to abbreviations:

LB – Leigh Blaney – PI/project lead

GS – Geoff Spriggs – project co-lead

RT – Research trainees - students

PAG – Project advisory group comprised of knowledge users: Chief fire officers, training officers, community mental health providers, Liesel Knaack – VIU CIEL Director.

KB – Jenny Cartwright – Knowledge broker

Table 1- Project workplan, timeline and deliverables

Phase	Task	Timeline	Responsibility	Deliverable/Output
Phase I PROJECT SET UP	Team meeting	Sept 2018	LB, GS	Meetings to go over roles, expectations, timeline etc.
	Hiring	Dec 2018	LB, GS	Research assistants hired (VIU work op fund) (Sept-Apr)
	Finish literature review	Sept 2018-Jan 2019	LB, GS	Literature review update particularly any published studies on effectiveness of resilience education
Phase II PROJECT DEVELOPMENT	Complete & submit ethics application	Aug 2018		Ethics approval granted Oct 9/18
	Team development (i.e. recruit content experts for curriculum development)	Oct- Dec 2018	LB, GS	Create Project Advisory Group (PAG) for project oversight & support; include representatives from volunteer FRS (Training Officers), healthcare, VIU-CIEL, Statistician
	Team meeting	Dec 2018 & ad hoc	LB, GS, RTs	Progress review, tasks moving forward; review & revise curriculum as needed; evaluate timeline/schedule, and book training events
Phase III PROJECT IMPLEMENTATION	Training	Feb – May 2019	LB, GS, RTs	Deliver 1-2 workshops/FRS, Saturday or Sundays;
	Data collection	Feb-May 2019	LB, GS, RTs	Collect & secure completed questionnaires
	Narrative Data analysis	Feb – May 2019	LB	Narrative questionnaires analyzed, themed, and collated
	Data Analysis using SPSS	Feb – Apr 2019	Statistician	All data analyzed and figures made of results
	Team meetings	Feb 2019 Apr 2019 May 2019	LB, GS, RTs	Assessment of progress, trouble shoot where necessary
	Data analysis of final questionnaires	May-July 2019	LB, GS, RTs PAG, Training officers,	All data analyzed; table & figures developed; ongoing 'writing up' of project

	(2-month post)		Statistician	
Phase IV PROJECT WRAP UP (Knowledge Mobilization)	½ day workshop hosted at one of the participating FRS	Sept 2019	LB, GS, RTs, PAG, KB	Bring together research participants, PAG knowledge users, other researchers to share outcomes
	Journal Article	Nov 2019	LB, GS, RTs, KB	Submit article to peer reviewed journal; present outcomes at conferences
	Final report	November 2019	LB, GS, RTs	Complete and submit outcomes Report to WorkSafeBC

Outputs, Outcomes, and Knowledge mobilization

There are short-, mid-, and long-term outcomes expected from this research

1. In the **short term** this research will:
 - a) Strengthen team building and collaborations across institutions
 - b) Train/mentor student researchers
 - c) Build and strengthen VIU's research capacity

2. In the **medium term** this pilot project will:
 - a) Pilot the implementation of resilience education for firefighter
 - b) Demonstrate, through pre and post training pilot data, the effectiveness of resilience education two months post training (i.e. increased resilience scores & perceptions of resilience) thereby protecting as well as improving firefighters' mental health.
 - c) Provide pilot data to strengthen larger external grant applications.
 - d) Generate research reports for dissemination to staff, & per the reporting requirements of WorksafeBC and VIU, dissemination to public domains (i.e. VIUSpace <https://viurrspace.ca/handle/10613/3277>)
 - e) Advance knowledge of resilience and resilience education nationally & internationally:
 - a. Conference presentations such as: Canadian Federation of Mental Health Nurses annual general meeting/conference; Canadian Health and Wellness Innovations conference, etc.
 - b. Journal articles focusing on the overall research outcomes; submissions will be made to a variety of peer-reviewed journals such as the Canadian Journal of Nursing Research; the International Journal of Emergency Services, etc. The team will also publish more widely in occupational health/safety journals again to highlight research collaboration, and effectiveness of resilience education. As well, articles will also be submitted to trade journals such as: the Canadian Nurse, Nursing Times, etc.

3. **Long-term** outcomes of this research will be:
 - a) Improved workplace health outcomes: resilient firefighters provide better quality of community service
 - b) Pilot implementation of the resilience training curriculum at VIU & in other high-risk professions such as fire, paramedic, police, and other nursing settings.
 - c) Demonstrated feasibility of further research into resilience education thus forming the foundation of external grant applications such as a CIHR Collaborative grant.
 - d) International collaborations for further resilience education research (i.e. the project co-leads are well-connected with national & local nursing organizations in the United Kingdom, United States, Belgium and other European nations who are leaders in supporting the psychological health of nurses & other emergency providers; hence these supporters provide a foundation of stakeholders/research users & potential collaborators.

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PROJECT BUDGET- Leigh Blaney- Explore Grant 2018

	WorksafeBC Cash	FRS In-Kind	VIU Cash	VIU In-Kind	
CATEGORIES					
Personnel Costs					Comments
Primary Investigator/Project Lead					Salaried employee - VIU
Co-applicant					Salaried employee - Langford Fire Rescue
Undergraduate students - research assistants			2,000 3,559		VIU Explore Grant VIU Student Work Opportunity Fund summer 2019; fall 2019
Undergraduate students - research assistants	9,611				Top-up VIU Explore Grant
Statistician	1,000				Graduate student \$20/hr x 50 hrs - Quantitative data analysis
Sub-Total Personnel Costs	10,611	0	5,559	0	
Travel Costs					
Sub-Total Travel Costs	2,028	0	0	0	
Research Project Costs					
Sub-Total Research Project Costs	1,750	4,410	0	0	
Knowledge Mobilization Costs					
Conference attendance for presentation of outcomes					i.e. Fire Chiefs Association of BC annual conference; International Critical Incident Stress Foundation bi-annual World Congress...
Student research assistants	1,700				Funds from Worksafe BC for students to attend
Co-applicant		1,000			Funds from Langford RFR Education fund for co- applicant to attend conference
Principal Investigator			1,000		Funds from PI's Pro-Development Funds
Sub-Total Dissemination Costs	1,700	1,000	1,000	0	
TOTAL	16,089	5,410	6,559	0	



City of Langford

www.cityoflangford.ca

2018/01/26

Worksafe BC Research Services
PO Box 5350, Stn Terminal
Vancouver, BC V6B 5L5

**Re: Proposed Innovation at Work Grant Application:
Building resilience in volunteer firefighters: Bridging the research to practice gap**

This letter confirms that Langford Fire Rescue fully endorses Leigh Blaney's research team's study *Building resilience in volunteer firefighters: Bridging the research to practice gap*. We will provide whatever logistical support is necessary (i.e. access to fire stations and personnel, use of the training room at Station 1, photocopying/printing, etc.).

Leigh's advocacy for resilience and mental health in the FRS is much appreciated by our department, and we will actively support the research team in investigating and sharing firefighter perspectives of resilience with other stakeholders and funding agencies.

If any additional information is required, please feel free to contact me directly.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Aubrey".

Chris Aubrey
Fire Chief
Langford Fire Rescue



SOOKE FIRE RESCUE DEPARTMENT
2225 OTTER POINT ROAD
SOOKE, BC V9Z 1J2
PH. 250.642.5422 | FAX.250.642.3840



February 5th, 2018

Leigh McCarley Blaney, PhD, RN, CFMHN(C)
Professor - Bachelor of Science in Nursing Program
900 Fifth Street
Nanaimo, BC, Canada V9R 5S5
(250) 753-3245 x 2519
leigh.blaney@viu.ca

Leigh –

This letter confirms that Sooke Fire Rescue service fully endorses Leigh Blaney's research team's study Building resilience in volunteer firefighters: Bridging the research to practice gap. We will provide whatever logistical support is necessary (i.e. access to fire stations and personnel, use of the training room at Station 1, photocopying/printing, etc.).

Leigh's advocacy for resilience and mental health in the FRS is much appreciated by our department, and we will actively support the research team in investigating and sharing firefighter perspectives of resilience with other stakeholders and funding agencies.
If any additional information is required, please feel free to contact me directly.
Sincerely,

Kenn Mount
Fire Chief/Director of Community Safety
District of Sooke



THE METCHOSIN VOLUNTEER FIRE DEPARTMENT
4440 HAPPY VALLEY ROAD
VICTORIA, BC V6C 3Z3
Ph: 250.478.1307 Fax: 250.478.1309
Email: firechief@metchosinfire.ca

February 5, 2018

To Whom It May Concern:

I am writing in support of Leigh Blaney's research on *Building resilience in volunteer firefighters: Bridging the research to practice gap*. Our department fully endorses Leigh's work; any research which potentially leads to an improvement in the services we can provide our members is greatly appreciated. Our department is fortunate that we can access such services, and it has been clearly demonstrated at least from the perspective of firefighters that resilience is a key feature of overall psychological health and well-being.

Our department has partnered with Leigh on several initiatives supporting the retention of firefighters in this high-risk profession. She has consistently advocated for firefighters and the fire service, and works tirelessly to ensure that mental health in the fire service is promoted and supported. The issue of mental health is a growing topic in the fire services, and Leigh has been a leader and champion for health, coping, and resilience – perspectives which are endorsed by firefighters.

The Metchosin Fire Department endorses the application for research funds; we will provide in-kind support such as training rooms, workshop aids such as flip chart/paper/pens, assorted other material development costs, laptop/projector, and photocopying of consent forms, surveys, and workshop handouts.

Should you require any further information please feel free to contact me.

Sincerely,

Stephanie Dunlop, Fire Chief
Metchosin Volunteer Fire Department
250.478.1307 / 250.883.4472



*Worksafe BC Research Services
PO Box 5350, Stn Terminal
Vancouver BC
V6B5L5*

23 January 2018

I am writing in support of Leigh Blaney's research on *Building resilience in volunteer firefighters: Bridging the research to practice gap*. Our department fully endorses Leigh's work; any research which potentially leads to an improvement in the services we can provide our members is greatly appreciated. Our department is fortunate that we are able to access such services, and it has been clearly demonstrated at least from the perspective of firefighters that resilience is a key feature of overall psychological health and well-being.

Our department has partnered with Leigh on a number of initiatives that support the retention of firefighters in this high-risk profession. She has consistently advocated for firefighters and the fire service, and works tirelessly to ensure that mental health in the fire service is promoted and supported. The issue of mental health is one that is not easily accepted or discussed in the FRS, but Leigh is a champion for health, coping, and resilience – perspectives which are endorsed by firefighters.

I am fully endorsing the application for research funds; we will provide in-kind support such as training rooms, workshop aids such as flip chart/paper/pens, assorted other material development costs, laptop/projector, and photocopying of consent forms, surveys, and workshop handouts.

Please feel free to contact me if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Carrie Boland". The signature is fluid and cursive, with the first name "Carrie" written in a larger, more prominent script than the last name "Boland".

Carrie Boland

Manager Acute MHSU services
1200 Dufferin Cres
Nanaimo BC, V9S2B7
250-740-2656

Leigh Blaney- Explore Grant 2018- PROJECT TEAM ROLES & RESPONSIBILITIES

PI – Leigh Blaney

- Project lead
- Project coordination
- Permissions, ethics approval
- Develop training curriculum; ensure collaboration with Project Advisors – schedule meetings/teleconferences for feedback on curriculum drafts, etc.
- Present/deliver curriculum (with eye towards post-project shift to Train-the-Trainer)
- Co-create and deliver dissemination activities (journal articles, conference presentations)

Co-researcher – Geoff Spriggs

- Project co-lead
- 'point person' contact for each FRS; follow-up with each FRS (i.e. letters of support, training officer recruitment for post-tests; retrieval of post-tests, etc.)
- Infrastructure duties – logistics & scheduling of training with FRS; collaboration with training officers
- Coordinate team initial team visits to each FRS to ...project
- Coordinate & schedule training sessions at each FRS
- Collaborate on curriculum development – content, delivery
- Collaborate on preparation/delivery of dissemination activities (journal articles, conference presentations)

Research trainees (2 BSN students) (to be recruited once funding/contract is secure)

- Edit training materials
- Infrastructure duties – ensure photocopying, training materials ready for each training session; ensure materials and supports (food/fluids) available for each meeting and workshop
- Assist with data collection at each site
- Assist with data analysis – VIU research centre
- Assist with preparation/delivery of dissemination activities.

Statistician – Dr. Eric Agyekum

- Align statistical processes with the research questions
- Perform and interpret statistical analyses, etc.

Training officers (1 from each FRS)

- Support project and project leads to engage firefighters in participation

- Coordinate linking individual firefighters with numbered resilience scale packages (to anonymize the data for the research team) to ensure that the remote (1 month follow-up) data collection is matched with the data set each member created at the pretest and immediate posttest
- Oversee 3rd data collection; ensure security of raw data; forward raw data to research team/hold data (3rd Resilience Scales) for pick-up by research team.

Project Advisory Group

- Preview, feedback, and review curriculum and training materials to ensure 'fit' with adult learning principles and with firefighter culture/existing knowledge.