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BUILDING BEST PRACTICE IN CHILD-CENTRED DISASTER RISK REDUCTION

Annual Project Report 2018-2019

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EXECUTIVE SUMMARY

Emerging as a distinct approach to disaster risk reduction (DRR) over the last 15 years, the primary objective of Child-Centred Disaster Risk Reduction (CCDRR) is to strengthen children's knowledge and skills so that they understand the disaster risks that exist in their communities and can take a lead role in reducing those risks. In the Australian context, the most commonly practiced form of CCDRR is school-based Disaster Risk Reduction and Resilience Education (DRRRE).

To support the delivery of effective and sustainable in DRRRE in Australian schools, research conducted in the first phase of this project (2014-2017) was focused on the development of guiding models and frameworks and the evaluation and redevelopment of End-User DRRRE programs and resources.

For second phase of the project (2017-2020), the focus has shifted toward school-led DRRRE programs and initiatives, which will enable bottom-up processes to inform end-user policy and practice. The project is also addressing the vexing issue of scaled implementation through the development of an evidence-based national framework which brings together the concerns and priorities of emergency management agencies and the education sector.

This Annual Report provides a summary of progress to date, including a discussion of how cumulative research outputs from the first four years of the project are being utilised by End-User agencies to inform DRRRE program design, implementation and evaluation. It then provides the details on the various research activities which comprise the 2017-2020 research program, including:

1. Project-based learning for disaster risk reduction and resilience: an explanatory case study from Harkaway Primary School;
2. Descriptive case studies of good practice in DRRRE;
3. A National study of DRRRE implementation: the 3Rs of disaster education;
4. The redevelopment of the DRRRE Practice Framework.

The report also includes a summary of current PhD projects and a comprehensive list of publications that have been produced over the course of the project.



END-USER PROJECT IMPACT STATEMENT

Matthew Henry, *Senior Engagement Advisor - Capability Partnerships, Victorian Country Fire Authority*

The research utilisation tools and products developed through the CCDRR project team have enabled the CFA to review and progress all aspects of its fire safety and disaster resilience risk reduction and resilience education (DRRRE) programming. In particular, the DRRRE Practice Framework has had a direct and significant impact on our organisation's approach to program design, implementation and evaluation. Influenced by the guiding principles and core dimensions of the framework, we are now taking a more participatory, collaborative approach to program design by involving students, teachers, and local volunteers in decision-making about program objectives, structure and content. We have also recognised the importance of school-community partnerships for sustainable program delivery and have increased our commitment to the ongoing monitoring and evaluation of program outputs and outcomes. The CCDRR project has provided a continuous process of consultation in the form of end user capacity building and planning workshops, face-to-face meetings and frequent teleconferencing opportunities, which have enabled participating agencies to collaborate when considering new educational program initiatives. Through participation as an end-user in the CCDRR project, CFA are confident that the application of the DRRRE Practice Framework and other research outputs will ensure that programs and initiatives are supported by a strategic, evidence-based approach and robust monitoring and evaluation processes. This will support the delivery of effective, sustainable programs across our jurisdiction.



PRODUCT USER TESTIMONIALS

Conrad Walsh, *Community Safety Coordinator (Youth), Fire and Rescue New South Wales*

In 2016-2017, the CCDRR project undertook an in-depth Practice Review of NSW Fire and Rescue's school based FireEd programs. The practice review has provided an informative insight into their shortcomings. The review has been extremely helpful to identify the approach for the update of the programs in-line with measures to address the lack of uniformity in the delivery of the outcomes. The practice review highlighted a need to focus more on specifically providing presenters with explicitly identified topics on what to communicate as well as the need to provide greater awareness of and on the programs. This is in contrast to the need for allowing presenters to adjust the way they present the contents of the program to suit their needs and those of the audience. It is through the support and effort of Dr Towers that we are now able to progress the update of the FRNSW Fire Ed programs to meet the needs of all stakeholders and include fire fighters themselves to be able to share their successful presentation models across the organisation.

Liz Addison, *Youth Strategy Research & Development Coordinator - Community Preparedness, Western Australia Department of Fire and Emergency Services*

Dr Briony Towers completed an evaluation of the Upper Primary (Years 5-6) component of the Department of Fire and Emergency Services' Bushfire Patrol Program in April 2018, using the practice framework for Australian emergency management agencies developed by the CCDRR project in 2016. Bushfire Patrol was originally released in 2013, when there was little research literature available on children and bushfires. The evaluation of the program was a world-first in-depth examination of a teacher-delivered bushfire education program.

The evaluation findings have provided an essential spring-board to the development of a newly revised Bushfire Patrol program which aims to increase children's knowledge and skills and provide the foundation for children to contribute to bushfire planning and preparedness in their own homes. Thirty-two recommendations were provided to DFES, most of which have been incorporated into a reformatted and revised Upper Primary (Grade 4-6) program. The revised program provides five key modules, which include topics such as understanding bushfire, causes of bushfire, Fire Danger Ratings, bushfire plans and warnings. The results of the evaluation have also guided the revision of the Lower Primary (Grade 1-3) program.

DFES have also used the Disaster Resilience Education Practice Framework to guide the development of North West Bushfire Patrol – a school-based bushfire education program that is geographically and culturally appropriate for the North West Regions of Western Australia. Activities in the program assist students to identify ways to stay safe during a fire, as well as detect bushfire risk factors (e.g. changes in seasons and weather) to prepare for bushfire. The core dimensions and guiding principles of the Practice Framework provided a



valuable evidence-based guide to ensure that the program reflects current policy, research and good practice in DRRRE.

The DFES School Aged Education Team see great value in being end-users in the CC-DRR project and look forward to the continued working relationship to improve disaster risk reduction outcomes in school communities.

Matthew Henry, *Senior Engagement Advisor - Capability Partnerships, Victorian Country Fire Authority*

Developed through a dual agency multi-hazard pilot project led by the Victorian Country Fire Authority (CFA) and the Victorian State Emergency Service (VicSES), the 'Disaster Resilience Project' (DRP) is a teacher-delivered Disaster Risk Reduction and Resilience Education (DRRRE) program for Victorian secondary school students in Years 7 -9. The DRP is comprised of six interactive web-based lessons designed to increase students' knowledge and awareness of their local disaster risks and build their capacity for initiating and participating in practical action for disaster risk reduction and resilience. To support scaled implementation in schools, the DRP is aligned the Victorian school curriculum and includes a professional development package aimed at building teacher capacity and capability for program delivery.

Throughout the development of the DRP, the contributions of the CCDRR research team were invaluable. During the initial design of the pilot version, they provided technical advice to ensure that the program structure and content was underpinned by current theory and research on hazards and disasters, disaster risk reduction and resilience, and DRRRE. Once the pilot version was ready to be trialed, they conducted an in-depth qualitative feasibility and acceptability study in two Victorian schools. This study, which involved focus group interviews with 120 students and in-depth interviews with four teachers, identified numerous strengths and weaknesses in relation to specific learning intentions, teaching and learning activities and methods of assessment. Importantly, where weaknesses were identified, teachers and students offered valuable recommendations for improvement and these have been incorporated into a revised version of the DRP.

This feasibility study represented a major shift in the CFA's approach to DRRRE program development. Specifically, it provided a robust platform for the active participation of students and teachers in decision-making relating to program design and implementation, thereby ensuring that the DRP not only embodies good practice principles education, but also reflects the needs, interests and capacities of young people. Through this process, the CCDRR project has facilitated the development of an effective and scalable DRRRE resource that promotes and supports shared responsibility between schools, the emergency services and the wider community.



BACKGROUND AND STRATEGIC CONTEXT

Emerging as a distinct approach to disaster risk reduction (DRR) over the last 15 years, the primary objective of Child-Centred Disaster Risk Reduction (CCDRR) is to strengthen children's knowledge skills so that they understand the disaster risks that exist in their communities and can take a lead role in reducing those risks^{1,2,3}. This notion that children and youth can actively contribute to DRR and resilience is explicitly acknowledged in the UNISDR Sendai Framework for Action, which states: "*Children and youth are agents of change and should be given the space and modalities to contribute to disaster risk reduction, in accordance with legislation, national practice and educational curricula*"⁴.

In the Australian context, the most commonly practiced form of CCDRR is school-based Disaster Risk Reduction and Resilience Education (DRRRE)⁵, the importance of which has been explicitly acknowledged in both the Australian National Strategy for Disaster Resilience and the National Curriculum⁶. To support the delivery of effective and sustainable in DRRRE in Australian schools, research conducted in the first phase of this project (2014-2017) was focused on the development of guiding models and frameworks and the evaluation and redevelopment of End-User DRRRE programs and resources^{5,7,8,9,10,11}. Upon completion of this first phase, cumulative research findings and extensive consultation with end-users indicated the need to shift from the traditional top-down approach to DRRRE programming to a more participatory approach that enables bottom-up processes to inform the design, implementation and evaluation of programs and initiatives.

In recognition of this, the 2017-2020 phase of the project involves explanatory and descriptive case studies of school-led DRRRE programs and initiatives, as well as the development of a National framework for DRRRE implementation which brings together the concerns and priorities of emergency management agencies and the education sector. Additional work will involve the redevelopment of our DRRRE Practice Framework⁵ to incorporate key findings and insights from our own research, as well the international literature on CCDRR and DRRRE^{11,12}. Each of these projects has been developed in close consultation with End-User representatives and other key stakeholders, including school leaders. They are also directly aligned to our research utilisation road map.



RESEARCH APPROACH

The CCDRR research program for 2017-2020 builds on the theoretical, conceptual and empirical work of the last four years. It is comprised of three major empirical studies that seek to address the key questions, needs and priorities of our end-user agencies, as well as other key stakeholders in DRRRE, including teachers, children, parents and emergency management staff and volunteers.

1. Project-based learning for disaster risk reduction and resilience: an explanatory case study from Harkaway Primary School.
2. Descriptive case studies of good practice in DRRRE.
3. A National study of DRRRE implementation: the 3Rs of disaster education.

Combined with the empirical insights gained through our completed program evaluations and systematic reviews of the literature, the findings from these studies will feed into the redevelopment of the DRRRE Practice Framework, which will constitute a core utilisation product for the CCDRR project. The three major studies, which are in different stages of development, are outlined in detail below.



PROJECT-BASED LEARNING FOR DISASTER RISK REDUCTION AND RESILIENCE: AN EXPLANATORY CASE STUDY FROM HARKAWAY PRIMARY SCHOOL

Background and research objectives

To support the implementation of DRRRE in Australian classrooms, emergency management agencies and other organisations have developed a range of programs and resources, some of which have recently been evaluated by the research team^{7,8,9,10}. Alongside the growing literature on DRRRE, these evaluations have pointed to the value of student-centered, participatory pedagogies that enable students to develop and apply their knowledge and skills in ways that are purposeful, meaningful, and relevant in the context of their own lives. A student-centered, participatory pedagogy identified by the project team as holding promise for DRRRE is Project-Based Learning (PBL).

In PBL, the teacher uses situations arising in local contexts and the lived experiences of students, families, and community members, to shape a particular problem-based curricular unit¹³. The process begins with an initial experience in which students are challenged with a problematic situation that prompts their thinking and causes them to ask a multitude of questions. This leads to a series of central experiences in which students decide what is personally meaningful to them, plan their inquiries, collect and compile information, reflect on their findings, and determine what they have learned in relation to the problem they first posed. The learning process is facilitated by teachers and is often further augmented by the direct involvement of community partners who possess relevant expertise and experience that can support the students in their inquiries. The PBL process concludes with a culminating experience in which students share their inquiries with one another and, typically, with a broader audience of vested interest.

PBL invites students to apply the knowledge they gain in real life contexts to move beyond their initial conceptions to the generation of new possibilities and innovations¹³. In this sense, the processes and outcomes PBL are highly consistent the overarching aims of DRRRE and the positioning of children and young people as agents of change as represented in the UNISDR Sendai Framework. However, rigorous in-depth studies of PBL and other student-centered participatory approaches to DRRRE are scarce, both in Australia and internationally. As educators and emergency management agencies seek to develop effective, sustainable models of DRE in Australian schools, this represents a significant research gap.

As part of a broader attempt to develop evidence-based approaches to DRRRE, this study aims to establish how PBL can be used to support student agency in learning and action for bushfire risk reduction and resilience. This is being pursued through an in-depth case study of a PBL unit in two Grade 5/6 classrooms at Harkaway Primary School, a Victorian Government school located in a bushfire prone area on the peri-urban fringe of Metropolitan Melbourne.

Research questions



The research questions driving this case study include:

1. How does PBL support learner agency in bushfire education?
2. How does PBL influence students' bushfire safety knowledge and skills?
3. How do students demonstrate their bushfire safety knowledge and skills during the PBL process and how is student learning assessed?
4. How does PBL influence student participation in bushfire safety discussions and activities in different contexts (e.g. household, school, community)?
5. How does the involvement of community partners (e.g. CFA staff/volunteers) support student learning and action?
6. How does a PBL approach to bushfire education influence student wellbeing and personal development?

Methodology

The project is employing an explanatory single case study design. The selection of the case has been determined by three key factors: 1) The school is located in an area identified by the Victoria Country Fire Authority (CFA) as having a 'very high' level of bushfire risk and is listed on the Victorian Department of Education Bushfire Risk Register; 2) the school is seeking to contribute to the development of evidence-based practice in DRRRE; 3) the school staff have experience and expertise in project-based learning, and a strong commitment to learner agency is reflected in the school's educational mission and philosophy.

The theoretical approach underpinning the research design and methodology is multifaceted and draws on several prominent concepts and frameworks in human development and education, including Bandura's theory of human agency^{14,15}, the New Sociology of Childhood¹⁶, the ecology of human development¹⁷ and student voice^{18,19}. The case study is employing naturalistic, interpretivist methodology which enables the process and outcomes of PBL for DRR and resilience to be understood from the perspectives of key stakeholders (e.g. teachers, students, parents), with the meaning and experience of behaviour conveyed in context and in its full complexity^{21,22,23}.

A suite of qualitative ethnographic methods is being employed, including student focus groups, student video journals, student peer-to-peer interviews; participant observation of classroom activities, informal interviews with teachers and students in the classroom, in-depth semi-structured interviews with teachers, community partners and parents, and document analysis. All data is being managed and analysed in NVIVO using the constant comparative method, which involves the simultaneous coding and analysis of data to develop and refine concepts, identify their properties, explore their relationships to one another, and integrate them into a coherent explanatory model.



Progress to date

Data collection for the case study commenced in Term 4 2018 and will continue until Term 4 2019. As of July 2019, students have engaged in a wide range of learning activities aimed at building their foundation knowledge of bushfire behaviour, local bushfire risks, Fire Danger Ratings, bushfire warnings, bushfire planning and preparedness, and emergency response. Highlights have included a 'SimTable' demonstration delivered by a CFA fire management expert and learning to use the McArthur Metre to calculate local fire danger ratings with our own CFA end-user representative Matthew Henry. Students have now commenced the development of their projects, which are focussed on the design of 'bushfire safety products and solutions' for children in their community. They are engaging well with the student-led data collection methods (i.e. video journals, student peer-to-peer interviews), which combined with the student focus groups, participant observation/informal interviews in the classroom, and in-depth interviews with their teacher are providing a rich data set for analysis.

DESCRIPTIVE CASE STUDIES OF SCHOOL-LED DRRRE INITIATIVES

To further develop and enrich the DRRRE Practice Framework, the research team are currently pursuing the development of short descriptive case studies of Australian school-led initiatives. These case studies, which will be identified through our extensive networks of DRRRE practitioners, will serve to contextualise the practice framework with real world case examples of good practice in program design, implementation and evaluation. Stakeholder engagement for the identification and selection of case studies has commenced and a conceptual framework to guide data collection is currently under development. It is anticipated that data collection will commence in the second half of 2019. Case studies will then be written up and incorporated into the revised version of the DRRRE Practice Framework.

A NATIONAL STUDY OF DRRRE IMPLEMENTATION: THE 3RS OF DISASTER EDUCATION

Background and research objectives

Implementing DRRRE is consistent with several international strategies to which Australia is a signatory, including the United Nations Sendai Framework for Disaster Risk Reduction 2015-2030⁴ and the United Nations 2030 Agenda for Sustainable Development²³. For example, the *Sendai Framework* asserts that "*children and youth are agents of change and should be given the space and modalities to contribute to disaster risk reduction, in accordance with legislation, national practice and educational curricula*"⁴. Several of the Sustainable Development Goals are also relevant, particularly

- **Goal 4:** Ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all.
- **Goal 9:** Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.



- **Goal 11:** Make cities and human settlements inclusive, safe, resilient and sustainable.
- **Goal 13** (Take urgent action to combat climate change and its impacts)²³

At the national level, the importance of school-based DRRRE is emphasised in the *National Strategy for Disaster Resilience*²⁴, which lists the inclusion of risk reduction knowledge in school education programs as a priority outcome: “Risk reduction knowledge is included in relevant education and training programs, such as enterprise training programs, professional education packages, schools and institutions of higher education” (p. 7).

However, there is currently no comprehensive framework for implementing this priority. Some relevant content has been included in the Australian Curriculum⁶, but there has been little other action.

State and Territory emergency services and education authorities have a shared concern to:

- Protect students and educators from death, injury and harm in schools,
- Plan for continuity of education through all expected hazards and threats,
- Safeguard education sector investments, and
- Strengthen risk reduction and resilience through education²⁵

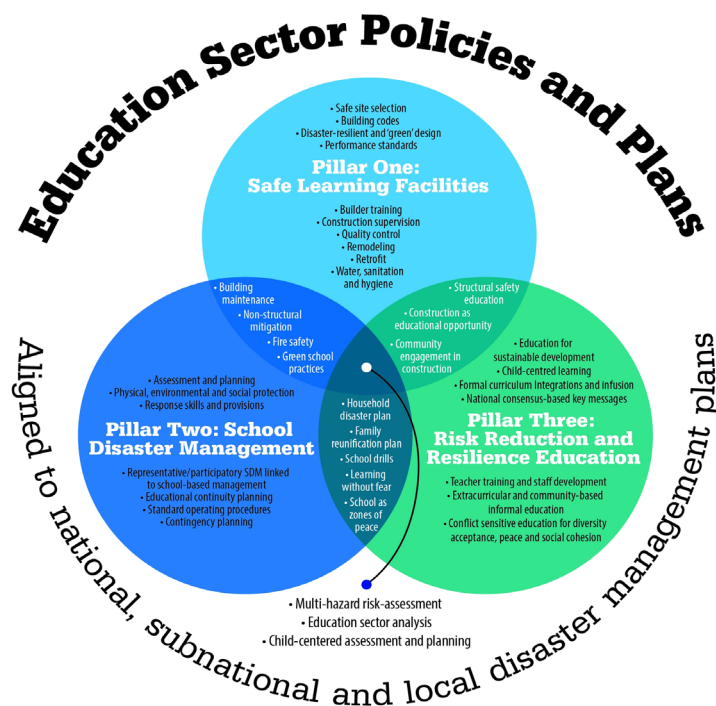


Figure 1: The three pillars of Comprehensive School Safety (GADRRRES and UNISDR 2017, p. 3).

Together these four goals form the basis for the three pillars of the Comprehensive School Safety (CSS) Framework²⁵ (see Figure 1):

1. Safe learning facilities
2. School disaster management
3. Risk reduction and resilience education.



Pillar 1 - Safe Learning Facilities is concerned with safe site selection, design, construction and maintenance (including safe and continuous access to the facility). The facilities sections of education authorities are generally responsible for Pillar One activities – ensuring that there are safe learning facilities for students and educators in schools – although school leadership also has a role in ensuring maintenance requirements are identified and reported. Emergency services are also involved in monitoring school facilities in hazard prone contexts (such as areas that could potentially be affected by bushfires or floods).

Pillar Two - School Disaster Management is concerned with assessing and reducing structural, non-structural, infrastructural, environmental and social risks, and by developing capacity and planning for educational continuity. In the Australian context, this is generally encompassed within school emergency management planning. Although Australian Standard AS 3745 – 2010 *Planning for emergencies in facilities*²⁶ is not legally binding, it is widely accepted as the benchmark when it comes to implementing emergency procedures and training within an organisation, and most state and territory education authorities require schools to prepare emergency management plans related to natural hazards and other emergencies^{27,28,29}.

Pillar Three - Risk Reduction and Resilience Education is supported in a variety of ways by education authorities and emergency services, but it is probably the area that needs the most attention. DRRRE can be taught across a range of year levels (from foundation to Year 12) and learning areas in the Australian Curriculum (Health and Physical Education (Personal, Social and Community Health); Humanities, Arts and Social Sciences Civics and Citizenship, Geography); Science (Earth and Environmental Science, Earth and Space Sciences, Physical Science, Science as a Human Endeavour)³⁰. Particularly relevant content about natural hazards is included in Foundation-Year 10 curriculum⁶. However, rather than adopting a whole school approach to Comprehensive School Safety, the curriculum content is generally treated in isolation from the other two pillars of safe school facilities and disaster management.

Various emergency services have produced curriculum materials for schools to support the teaching of the relevant areas of the Australian Curriculum, but teachers do not necessarily know about or access these resources, and risk reduction and resilience education is generally not included in pre-service teacher education programs or in-service professional development opportunities.

Furthermore, the responses to the three pillars of CSS from education authorities and emergency services rarely adopt a child-centered approach whereby children are learning about and participating in CSS, even though such an approach was recommended in the Sendai Framework:

There has to be a broader and a more people-centered preventive approach to disaster risk. Disaster risk reduction practices need to be multi-hazard and multisectoral, inclusive and accessible in order to be efficient and effective. While recognizing their leading, regulatory and coordination role, Governments should engage with relevant stakeholders, including women, children and youth, persons with disabilities, poor people, migrants, indigenous peoples, volunteers, the community of practitioners and older persons in the design and implementation of policies, plans and standards (p.10)⁴.



This study will draw on the CSS Framework – particularly the intersection of Pillars 2 and 3 – to develop a framework for integrating DRRRE and School Disaster Management in schools. While the ideal is for all schools to adopt a systematic approach to reduce all potential hazards and threats in their environment, the specific focus for this proposed project is natural hazards – including bushfires, floods, and other extreme weather events and the implementation of CSS in schools that are exposed to these natural hazards.

Research Aims

This research aims to:

1. Identify existing emergency management planning policies and documentation requirements in schools and the role the emergency services play in the fulfillment of those requirements.
2. Identify opportunities for integrating Comprehensive School Safety (particularly pillars two and three) into the school curriculum.
3. Develop a framework for schools, which integrates child-centered community-based DRRRE with emergency management planning in schools.
4. Investigate the acceptance of the framework to State and Territory education authorities.

Rationale

Emergency service organisations are concerned with protecting people from death, injury and harm, including students and educators in schools. Education departments require schools to develop emergency management plans, and content related to natural hazards is included in the Australian curriculum. However, while there is an emphasis on keeping children safe and for schools to have emergency management plans, DRRRE is seen by education authorities as yet another pressure from external bodies on an already overcrowded curriculum to include something that is not seen as educationally important, i.e. more of a political priority than an educational one, and the three pillars of the CSS Framework are not brought together in the work of schools. This project aims to bring these pillars together, particularly pillars two and three.

The project also builds on the experiences of the Australian Sustainable Schools Initiative (AuSSI) and particularly Sustainable Schools in New South Wales where all schools are mandated under the Environmental Education Policy for Schools to have a school environment management plan³¹. This policy has three focus areas: curriculum; management of resources, and management of school grounds.

AuSSI advocates a whole school approach, which places the student at the center of the learning process and advocates a close relationship with the local community³². An evaluation of the Sustainable Schools pilot program in NSW³³ concluded that:

“The experience of case study schools suggests that where a school has a strategic planning process already in place or adopts the structure of the SEMP, it is likely that their approach to environmental sustainability will be more systematic, holistic and longer-term” and that sustainability is well integrated into the school curriculum (pp. 9-10).



A whole school approach will bring together everyone's concern for the safety of children with school governance, the school buildings, resource management, the local community and related networks and partnerships, the curriculum and students' learning experiences (see Figure 2). At present, the curriculum related to natural hazards is taught in isolation from the emergency planning processes in place within the school. In addition, the curriculum is often taught in a transmission mode – teacher-led rather than student-centered. Yet, in communities vulnerable to natural hazard events it is important for students to be given opportunities to be empowered by encouraging their participation in disaster preparedness, response, and recovery activities^{4,34,35,36,37,38}. The DRRRE Practice Framework also identifies the integration of education into school emergency management as a viable DRRRE implementation strategy.

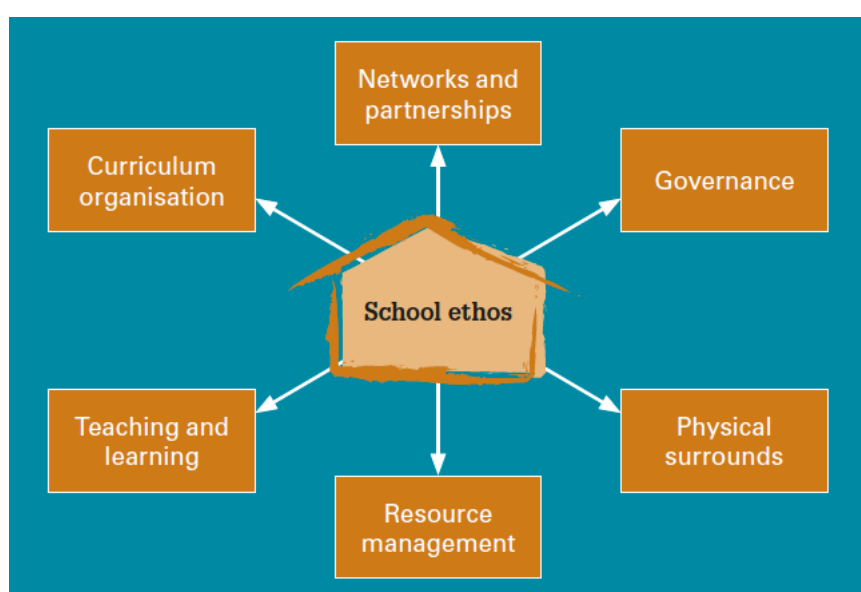


Figure 2: A whole school approach for Disaster Risk Reduction and Resilience Education where the School Ethos is Comprehensive School Safety (from Gough and Sharpley 2005, p. 7)

To bring together the concerns of both emergency services and education authorities in one document, this project will develop a National framework for DRRRE in schools along the lines of the *Educating for a Sustainable Future: A National Statement on Environmental Education for Schools*³².

Methodology

This project led by Professor Annette Gough, will employ a range of methods including literature reviews, document analysis, key informant interviews and focus groups with personnel from State and Territory emergency service organisations and education departments, and stakeholder workshops.

Progress to date

The research objectives and rationale for this project were developed in collaboration with end-user representatives at a capacity building workshop held at RMIT in February 2019. Following that workshop, a detailed project brief



was developed and additional feedback and input was sought from end-user representatives. Ethics approval for the research was obtained in May 2019. Document analysis of existing policies and procedures and key informant are currently underway and will be completed in August 2019. A stakeholder workshop to obtain wider input on the framework has been included in the formal agenda for the National DRANSZEN Forum in August 2019. The framework will then be drafted and revised before being finalised in January 2019. Utilisation activities will then commence. The nature of those activities will be informed by the outcomes of the research process and the framework itself.



PHD PROJECTS

Matthew Henry, PhD Candidate, CQUniversity

Project title: Comprehensive school safety: A participatory approach to school emergency management planning to reduce bushfire risk.

Project summary: Victoria is listed as one of the three most bushfire prone areas in the world. As the population of Victoria continues to increase, and communities spread out across a bushfire prone landscape, there is an increasing risk to life and property from bushfire. With the impacts of climate change, fire prone regions across Victoria are experiencing greater bushfire risk to lives and property than ever before. In 2009, the 'Black Saturday' bushfires destroyed 3 Victorian schools, and the loss of student life could have been catastrophic had this fire impacted on a weekday when students were at school. Marysville, Strathewen and Middle Kinglake primary schools were all destroyed in the 2009 fires and later rebuilt at a cost in excess of \$47 million.

As the Victorian education sector faces an increasing risk from bushfire, it is essential that bushfire mitigation policy and school emergency management planning (EMP) practices can adapt to this increasing risk and keep pace with contemporary national and international initiatives. One such initiative is the global Comprehensive School Safety (CSS) framework which provides a clearly defined approach to reducing hazard risk to the education sector by addressing three individual but related CSS pillars: 1) safe learning facilities; 2) school disaster management; and 3) risk reduction and resilience education.

To date, very little empirical research has investigated the application of the CSS framework model in schools, nor has any research explored the extent to which such a model has the capacity to make school communities safer from a range of hazard risks, including bushfire. This research is investigating a participatory approach to the implementation of Pillar 2 of the CSS framework to reduce bushfire risk across the Victorian education sector. It is proposed here that developing a participatory approach to the implementation of Pillar 2 of the CSS framework can enable schools to more effectively mitigate, prepare for, respond to and recover from the impacts of bushfire. While this thesis is focussed specifically on CSS Pillar 2, and the reduction of bushfire risk to the secondary school sector, the research findings will also have implications for the future implementation of CSS Pillars 1&3.

Andrew Clarke, PhD Candidate, CQUniversity

Project title: A Mixed Methodological Evaluation of the effectiveness of Key Safety Messages in dealing with stressful structural fire environments.

Project summary: This research into the effectiveness of Key Safety Messages (KSM) for structural fire safety will use a Mixed Methodological approach to examine a number of crucial aspects in this area of education. The retention and the application of taught KSM, particularly when applied under stress will be examined. The research will also look at how evaluations have been carried out in the School/Home Fire Safety space in the past and establish if there is a need to change some of these processes. Data will be gathered using a Mixed



Methodological Approach including quantitative and qualitative analysis of data gathered from pre-experiment Focus Groups and Interviews, the Virtual Reality (VR) Scenario based observations and the subsequent interviews.

The Focus Groups will bring together emergency response professionals as well as educators to examine what they believe are important Key Safety Messages for children as well as providing expert advice on how the scenarios should look. The information gathered from these Focus Groups will help to shape the content of the VR Scenarios. Face-to-face interviews will attempt to examine anecdotal evidence gathered from cases from throughout Australia, and internationally where Key Safety Messages have actually been applied in an emergency situation. This data will demonstrate the effectiveness of some Key Safety Messages in keeping people safe and, alternatively, when Key Safety Messages do not work or have unintended consequences. This data may provide some clues as to what constitutes effective Key Safety Messages and will possibly influence the design of the VR Experiment, with regards to the creation of the Scenarios.

The VR Scenario Experiment will provide information that will help influence current and future School and Home Fire Safety Programs. This will involve observing the application of these messages in the way they were intended. Too much focus in current research has been on the ability of people to retain these messages, where the focus needs to be on their actual application. It is envisaged that through the VR Scenarios the retention and application of Key Safety Messages will be more accurately evaluated.

Mayeda Rashid, PhD Candidate, CQUniversity

Project title: Disaster Resilience Education for Children: A Study in Bangladesh

Project summary: Over the last decade, a number of studies have been conducted on different types of disaster education programs for children. These studies suggest that such programs enable children to be more resilient not only in terms of increased knowledge on disaster risk reduction (DRR) but also increased preparedness and confidence, at both the individual and household levels. However, despite the positive findings, significant challenges still prevail. In spite of generating effective DRR outcomes, the area of program development and evaluation lacks a guiding model. This includes one that speaks to both the effectiveness and sustainable implementation. On the other hand, disaster education programs for children are mostly designed and implemented by non-formal educators like development and humanitarian agencies. As a result, the literature here is primarily based on the evaluation of programs, such as those of NGOs, many of which have been identified with significant methodological limitations. Besides, in terms of positive outcomes, the studies to date typically rely on DRR knowledge indicators and, further, do not identify the explicit elements of the programs responsible for generating specific positive outcomes.

This study aims to conduct rigorously designed research focused on DRR education for children, particularly those that involve children's active input and participation. In doing so, it has the aim of identifying the specific elements of the DRR education programs that produce the best DRR and resilience outcomes. Additionally, another aim is to examine implementation factors,



including those structural and process factors that facilitate versus impede sustainable implementation of such programs in a classroom and school setting, and active child-participation at all levels (both at decision making and implementation).

The study has been conducted in three phases. The first phase includes a multi informant, qualitative approach, primarily involving participants from three distinct groups: government officials, NGO practitioners (those implementing CC-DRR programs) and children (those participated in CC-DRR programs and studies DRR in school text books). Data collection methods utilised in this phase are qualitative interviews with the government officials and the NGO practitioners, focus groups discussion with the children and observation of NGO driven CC-DRR programs. The second phase involves child-led workshops for analysing the data gathered in the first phase. Finally, the third phase involves a follow up for ten months period to find how children's involvement in data analysis contribute in DRR in their school, household and community. Previous studies have captured the views of children, government officials and NGOs (Back, Cameron & Tanner, 2009; Djalante & Thomalla, 2012; Tanner, 2010). However, there are very few studies that combined the perspectives of all these stakeholder groups, especially none till date, in the field of DRR education for children. The findings of this study will help to address this void, which currently exists within the literature.

Tony Jarrett, PhD Candidate, CQUniversity

Project title: Enablers and inhibitors to the sustainable implementation of effective teacher delivered disaster resilience education through the Geography Syllabus

Project summary: Disaster resilience education (DRE) can be considered as disaster risk reduction measures for and with children, involving children, parents, communities, service providers, and governments. An example of DRE is the New South Wales Geography Syllabus that requires all Stage 3 students (Years 5 and 6) to study the effect of a contemporary bush fire event on people, place and the environment. Delivery is by generalist Primary School Teachers who have the educational skills and capabilities to deliver required learning Curriculum and Syllabus learning outcomes. Teachers identify Key Inquiry Questions Students to which students apply Inquiry Learning approaches to discover issues around the key question, identify problems and posing and construct solutions to authentic problems. Each year approximately 100,000 students in 4,000 classrooms across 2,500 schools do this Unit of Work each year. However, there are common obstacles to successful and sustainable implementation of disaster resilience education by teachers such as the busy curricula, lack of teacher training and necessary resources and tools, and lack of partnerships with emergency management agencies. There are also agency and institutional challenges to scaled implementation of evidence-based and practice-based programs that can meet both educational and DRE outcomes for students, households and teachers. Australia's National Strategy for Disaster Resilience, with its central theme of shared responsibility is a policy that is currently more aspirational than realised.

This project will identify that influence the uptake of disaster resilience education in schools and classrooms. It will also identify the factors that



contribute to translation into effective disaster risk reduction and resilience outcomes for children and youth, schools and households. The mixed methods research methodology will combine an experimental strategy with an identified qualitative design and methods to gather more in-depth information on enablers and inhibitors from teachers, principals and children. The study will also include both time series and benchmarking components. Further, a comparative study of disaster resilience education practice in Miyagi and Iwate Prefectures, Japan will be included. Following the March 2011 Tohoku Earthquake and Tsunami, educational authorities in Japan have instituted extensive policy and practice changes that apply the principles of the Comprehensive School Safety Framework and lessons learned from the Tohoku event. The findings will deliver short and intermediate term outcomes that pave the way for longer-term research and scaled implementation of DRE programming.

Revathi Krishna, PhD Candidate, Monash University

Project title: Coping with disasters by children and families who live in poverty

Project summary: Disasters have a disproportionate adverse effect on low and middle-income countries (LMICs) compared to high-income countries (HICs). Furthermore, people living in poverty are particularly vulnerable to the effects of disasters, with long-term economic, health, and mental health consequences. Children represent the largest population segment in low- and middle-income countries (LMICs) and are often the first and most affected victims in natural disasters. In addition to being exposed to physical injuries and potentially traumatic events, children can get separated from caregivers and therefore are vulnerable to exploitation or abuse. They may be confronted with a lack of food, shelter, and social support, and an inability to make sense of their surroundings, which lead to decreased ability to cope and increased vulnerability. Moreover, it challenges all levels of the socio-ecological system that the children are embedded in, making it hard for children to be able to make sense and cope with the event. Although long-term mental health problems related to natural disasters have been extensively documented children can also be innovative agents of change. They can play an active and valuable role in the development and application of strategies and practices to minimise disaster risks and vulnerabilities.

The United Nations' Sendai Framework has recently identified children and youth as agents of change and advocated for their active involvement in preparedness activities. Child-Centred Disaster Risk Reduction (CC-DRR) education or the Disaster Risk Education (DRE) programs have documented a number of benefits including families' better preparedness against disasters. Studies have noted the lack of active participation of children in the creation of these programs. Key challenges to the success of these programs are adequate and continuous training of the teachers, buy-in from the schools and parents. Although there is preliminary support for this stance, it has not yet translated into larger scale, action-oriented, active involvement of children, worldwide, including in India.

Through this PhD, Revathi aims to actively involve children in the development of a disaster resilience education programme and pilot it – assessing its acceptability and feasibility in the inner-city suburbs which are at high-risk to



hazards and poverty making them further vulnerable to the impact of a hazard in Chennai, India. The specific research questions being investigated include:

What are the experiences and needs of children and families living in poverty during the 2015 floods in Tamil Nadu, India?

How can a DRE intervention be developed to best prepare children and families living in poverty against future hazards relevant to the area?

How can participatory approach/ co-design approach be used to engage children in the adaptation and delivery of a DRE intervention?

Is the adapted DRE intervention acceptable and feasible to the children and families in the study areas and do they see it as helping them prepare for future hazards?

These questions are being answered in four phases; each phase tackling one question. The first phase was the systematic review. The next phase is the exploratory study conducted in Chennai. Part of that phase is also collecting data about children's perspectives on their experiences during the 2015 Chennai Floods and to understand what they think would have helped them prepare better. Phase three and four involve developing and testing of the DRE intervention. Specifically, phase three involved engaging with local and global experts in DRR to help develop a DRE intervention as well as contextualise it. In addition to that, children were involved closely in the development and delivery of the intervention. The last phase (phase four) is to test the intervention using long baseline as the control group.

Thus far, Revathi has conducted a systematic review to understand the coping strategies used by families in low and middle-income countries with a specific focus on the Asia Pacific region. Earlier in her candidature, she visited Tamil Nadu, India in order to interview some of the affected communities as well as staff of not-for-profit organisations who contributed to the relief work following the South Indian floods in 2015 as part of her formative research to use a participative approach to finalise and validate the research questions. They identified Disaster Resilience Education as one of their primary needs and were keen to get their children involved in the creation of such an intervention. She conducted intervention development discussions with various stakeholders and involved children actively in the development and delivery of the intervention.

The intervention development and delivery is currently underway. As a mixed methods study, focusing on participative approach, we have been co-developing a Disaster Resilience Education intervention, focusing on floods with children in the community. Two sessions have been developed thus far and one of them has been delivered in another community that was chosen to be the recipients of this intervention. These past weeks, she conducted in-depth interviews and focus group discussions with multiple stakeholders in order to test the acceptability, and feasibility of the intervention.

**Avianto Amri, PhD Candidate, Macquarie University**

Project title: Connecting the dots: Building disaster resilient households through a school based education intervention with children

Project summary: Recent in-depth studies on Disaster Resilience Education (DRE) have demonstrated that although programs have increased children's knowledge and awareness, there is little evidence of any significant improvement or change at home. Despite this, many DRE programs in schools continue to assume that knowledge will be shared to other household members and their peers. The latest research now points to the need for tools that enable parents to engage with their children in meaningful discussions. To address this need, this research documents a process to develop an innovative participatory tool designed by students and their parents. The tool encourages children to actively engage with their parents in discussions related to household preparedness plans.

Schools in Jakarta and Bandung, Indonesia have been selected for the development and testing of the tool. The children were aged between 9 and 12. A mixed method approach was utilised to investigate the effectiveness of the tool through a combination of questionnaires, focus groups, and family interviews for students, parents, and teachers. Surveys were conducted at pre- and post-tool roll out. Initial results have shown that the tool is successful in motivating parents to discuss household preparedness with their children and an effective way for developing household preparedness plan at-scale. In the future, this approach also has the potential to be expanded to other issues and life-skills program.



KEY MILESTONES

All key milestones for the project have been met for this project, and include the following categories:

- Ongoing consultation with End User representatives through quarterly National teleconferences; face-to-face meetings at end-user agencies for co-development, consultation, planning purposes; capacity-building and planning workshops, including our most recent two-day End User workshop in Melbourne, February 2018.
- Data collection and analysis for the suite of 2017-2020 research projects are well underway, including the in-depth case study of project-based learning for risk reduction and resilience and the national study of implementation.
- Completion of four empirical evaluations of end-user programs and successful translation of the findings into utilisation activities and products.
- Production of a comprehensive database of national and international on research DRRRE to inform systematic redevelopment of the DRRRE practice framework.
- End of year meetings with End Users for reviewing yearly outcomes and forward planning.
- Presentations at RAF and AFAC/BNHCRC conferences annually, including combinations of posters, seminars and main presentations.
- Quarterly and annual reports.
- Research outputs, including those that were identified deliverables but also additional research outputs, including numerous refereed journal articles, book chapters and conference proceedings.
- Numerous utilisation outputs that reflect our project plan but also reflect our guiding model for research and our extensive consultations with End Users and other major stakeholders. See next section for more detail.



UTILISATION AND IMPACT

SUMMARY

The CCDRR project has produced numerous research outputs - including program evaluations, practice reviews, and guiding frameworks - which have been utilised by End-User agencies to inform the development and redevelopment of various DRRRE programs. These research outputs are also being used by End-User agencies to inform longer term planning and decision-making regarding the design, implementation and evaluation of DRRRE in their jurisdictions. The utilisation and impact of four major outputs are summarised below.

EVALUATION OF BUSHFIRE PATROL

Output Description

Bushfire Patrol is a teacher-delivered bushfire education program for primary school students in the Southwest Land Division of Western Australia. Produced by the Western Australia Department of Fire and Emergency Services, the program aims to increase students' understanding of bushfire hazards and risks, provide them with essential knowledge and skills for bushfire mitigation, preparedness and response, and support them to contribute to bushfire risk reduction activities in their homes.

This evaluation of the Upper Primary (Grade 5-6) version of the Bushfire Patrol program constituted the first ever in-depth systematic investigation of a teacher-delivered bushfire education program. The evaluation had three main aims: 1) to examine the influence of the program on students' knowledge and awareness; 2) to examine the influence of the program on knowledge, awareness and levels of planning and preparedness in students' households; 3) to explore teachers' perspectives on the strengths and weaknesses of program design and implementation.

The evaluation employed a mixed-methods, repeated-measures, within-subjects design. For the purpose of the evaluation, the Bushfire Patrol program was delivered in two Grade 5 classrooms in a primary school located on the Rural Urban Interface (RUI) on the eastern side of the Perth Metropolitan area. The evaluation was conducted during Terms 2 and 3 of 2017. A total of 48 students participated in pre- and post-program interviews comprised of both quantitative structured questions and qualitative semi-structured questions designed to assess their awareness of local bushfire risks, their knowledge and awareness of bushfire risk reduction strategies, and the levels of bushfire planning and preparedness in their households. Upon completion of the program, ten parents participated in semi-structured interviews about the influence of the program on their households and the two Grade 5 teachers who had delivered the program were interviewed about their perspectives on program strengths, weaknesses and opportunities for improvement.



The evaluation found the program had achieved numerous positive outcomes, particularly in relation to children's bushfire-related fears and anxieties. At post-test, all children reported that while the program had made them more aware of local bushfire risks, they felt safer because they had learned about the actions that can be taken to reduce those risks. However, post-test data also revealed some prevailing knowledge gaps and persistent misconceptions, particularly in relation to the influence of weather conditions on fire behaviour, Fire Danger Ratings, Bushfire Alerts, and safe emergency response. Meanwhile, data from parent interviews indicated that program outcomes at the household level had been limited. Ostensibly, while teachers had encouraged their students to discuss their learning with their parents at home, they had been reluctant to make the standardised homework exercises compulsory, citing concerns about parental capacity to engage. Teachers and parents both suggested that a more flexible, context-sensitive approach to homework exercises would provide a more feasible pathway toward household discussion and action.

Extent of Use

- The evaluation identified 32 specific recommendations relating to program objectives, lesson structure and content, teaching and learning approaches, methods of assessment, curriculum integration, and home-based activities. These recommendations have informed the redevelopment of Bushfire Patrol and the new version was launched in December 2018.

Utilisation Potential

- There is potential for the evaluation findings to inform the design and implementation of bushfire education programs in other jurisdictions. In particular, evaluation findings related to children's interpretations of Fire Danger Ratings, Bushfire Alerts, and safe emergency response provide an evidence-base for teaching and learning activities that address key knowledge gaps and challenge children's core misconceptions.
- As an evidence-based teacher-delivered program that aligns directly with the school curriculum, the Bushfire Patrol program represents an important mechanism for the scaled implementation of bushfire education in the Southwest Land Division of Western Australia.
- The Western Australia Department of Education requires that all schools on the 'Bushfire Zone Register' incorporate key bushfire safety messages in their curriculum (WA Department of Education and Training, 2016). This requirement provides an important pathway for the scaled implementation of Bushfire Patrol in high bushfire risk areas.

Utilisation Impact

- The revised version of Bushfire Patrol was launched in December 2018 and is now available for use in primary schools across the Southwest Land Division of Western Australia.



- Assessing the impact of the program in terms of outputs (e.g. number of schools delivering the program), outcomes (increased knowledge, awareness and preparedness) and impacts (e.g. reduction in loss and damage) will require on-going monitoring, evaluation and research.

Utilisation and Impact Evidence

1. Towers B & Ronan KR. *Evaluation of Bushfire Patrol: Final Report to the Western Australia Department of Fire and Emergency Services*. March 2018. Bushfire and Natural Hazards CRC: East Melbourne.
2. Towers B. *Disaster Resilience Education in Australia*. Invited keynote presentation at the Western Australian DRANSZEN Forum, Perth 5 June 2018.
3. WA Department of Fire and Emergency Services. *Bushfire Patrol: Building disaster resilience in young people*. Available at <https://www.dfes.wa.gov.au/schooleducation/schools/Pages/default.aspx>

EVALUATION OF SURVIVE AND THRIVE

Output Description

Survive and Thrive is a place-based participatory bushfire education program for primary school students in grades 5 and 6. It is delivered through community-based partnerships between CFA brigades and local primary schools. To date, the program has been delivered in the Victorian localities of Anglesea and Strathewen. In Anglesea, the partnership between Anglesea CFA and Anglesea Primary School was established in 2013. In Strathewen, the partnership between Strathewen Primary School and the Arthurs Creek-Strathewen Fire Brigade was established in 2016. In 2017/2018, the research team conducted a summative evaluation of the program in both locations (Towers et al. 2018). The evaluation, which employed a mixed-methods ex-poste research design, found that the Survive and Thrive program had achieved a range of valuable outcomes at the child, household and community level (see Table 1).

Table 1: Outcomes of the Survive and Program.

Level of analysis	Observed outcomes
Child level	<ul style="list-style-type: none"> • Increased knowledge and awareness of local bushfire hazards. • Increased understanding of bushfire planning, preparedness, and response. • Increased self-confidence and a sense of empowerment. • Reduced bushfire-related worries, fears and anxieties.
Household level	<ul style="list-style-type: none"> • Increased knowledge and awareness of local bushfire hazards amongst parents. • Increased child participation in household planning and preparedness. • Enhanced planning and preparedness within households. • Increased capacity for bushfire emergency



	response.
Community level	<ul style="list-style-type: none"> • Strengthened CFA brigades. • Increased capacity for effective community engagement. • Strengthened relationships between CFA brigades and schools. • Strengthened relationships between CFA brigades and other local emergency management agencies.

The evaluation also identified several key mechanisms and processes that had contributed to those outcomes, including: the community-based partnerships between the local brigades and the schools; the strong support and commitment of local agency staff, volunteers and teachers; the specialist expertise of the Survive and Thrive Program Coordinator; an extended period of participation for each student cohort (approx. 2 years); the adoption of placed-based, experiential and participatory approaches to teaching and learning; the direct involvement of emergency management experts in teaching and learning activities; and the student-led production of presentations, workshops and arts-based learning artifacts (e.g. books, films) for the purpose of educating other children, families and the wider community.

Extent of Use

- The Survive and Thrive program continues to be delivered in both Anglesea and Strathewen¹. In Strathewen, the evaluation findings have been used to support the ongoing evolution of the program, including the recent incorporation of student-led participatory evaluation for supporting systematic assessments of program activities, outcomes and impacts. In August 2019, the Grade 6 class will present the results of their recent student-led participatory evaluation at the Australian Disaster Resilience Conference.
- The evaluation findings are being utilised by Harkaway Primary School to inform the design and implementation of a project-based learning unit on bushfire safety for Grades 5 and 6. This is the subject of an in-depth case study that is currently being undertaken by the research team.
- The evaluation report has been shared widely across the emergency management and education sectors and the research team continues to engage in discussions with various stakeholders regarding the suitability of the Survive and Thrive model for a number of high-risk and disaster-affected communities around Australia and internationally.

Utilisation Potential

The research team is seeking opportunities to implement and evaluate the model in new locations and there has been significant interest from numerous field-based practitioners who are seeking to design and implement more child-centered participatory approaches to school-based DRRRE. However, the

¹ In Strathewen, the program is now delivered under the banner of the 'Strathewen-Arthurs Creek Fire Education Partnership'.



Survive and Thrive model represents a significant departure from more traditional approaches to DRRRE and as with any innovation, it will be necessary to invest in capacity building and capability development for effective implementation at the local level. Hence, the research team is consulting with key stakeholders regarding the development of suitable methods, strategies and tools that can support planning and decision-making for implementation in other locations.

Utilisation Impact

- B. Towers presented her research on the Survive and Thrive model in the opening plenary of the CUIDAR Project's 'Finale Event' at the University of Lisbon in May 2018. The CUIDAR Project is an EU funded CCDRR project led by Lancaster University (UK), with the collaboration of the Institute of Social Sciences of the University of Lisbon (Portugal), the Open University of Catalonia (Spain), the University of Thessaly (Greece) and Save the Children, Italy and UK.
- B. Towers research on the Survive and Thrive model has been included in the Emerging Minds Community Trauma Toolkit produced by the Australian National University's Australian Child & Adolescent Trauma, Loss & Grief Network. The research is showcased in a podcast about promising approaches to bushfire education, as well a short film about the Strathewen Arthurs Creek Fire Education Partnership.
- B. Towers was invited to facilitate the 2019 Emergency Media and Public Affairs (EMPA) Workshop. This 4-hour participatory workshop titled 'Kids as Risk Communicators' showcased the Survive and Thrive model as a good practice innovation and featured Jane Hayward (Strathewen Primary School) and Lisal O'Brien (Arthurs Creek-Strathewen Fire Brigade) as special guest speakers.
- B. Towers and A. Gough presented key findings from the Survive and Thrive evaluation in an invited essay on DRRRE for 'Research Counts: A special collection on children and disasters' which has been published by the Natural Hazards Centre and the United States Centre for Disease Control and Prevention.
- B. Towers was invited to provide a 'researcher's perspective' on the benefits of genuine child participation in DRRRE in the 2018 film 'A walk through Strathewen's fire history' produced by the Strathewen-Arthurs Creek Fire Education Partnership.

Utilisation and Impact Evidence

1. Towers B, Perillo S, Ronan K. Evaluation of Survive and Thrive: Final report to Country Fire Authority 2019; Bushfire and Natural Hazards CRC
https://www.bnhcrc.com.au/sites/default/files/managed/downloads/evaluation_of_survive_and_thrive_paper_final.pdf
2. Towers B. *Learning to love where we live again: Place-based bushfire education for risk reduction, recovery and resilience*. XIX ISA World Congress of Sociology, Toronto, July 15-21, 2018.
3. Towers B. *Amplifying student voice and participation in disaster risk reduction and resilience education*. Invited presentation at the CUIDAR Finale Event, Institute of Social Sciences, University of Lisbon, 22-23 May, 2018 <http://cuidarfinale.ics.ulisboa.pt/>
4. BNHCRC. (2019). *Global focus on young people in disaster*. BNHCRC News, 1th October. Available at <https://www.bnhcrc.com.au/news/2018/global-focus-young-people-disaster>.
5. Towers B. *Kids as risk communicators*. (2019). Invited workshop at the Emergency Media and Public Affairs Conference, June 3, Sydney. <https://empa.org.au/images/documents/EMPA-SYD->



- [2019 Program web.pdf](#)
6. Emerging Minds. (2019). *Disaster preparedness, myths and programs that hold promise (podcast)*. ANU: Canberra. <https://emergingminds.com.au/resources/podcast/disaster-preparedness-myths-and-programs-that-hold-promise/>
 7. Emerging minds. (2019). *Strathewen-Arthur's Creek Bushfire Education Partnership (film)*. ANU: Canberra. <https://emergingminds.com.au/resources/strathewen-arthurs-creek-bushfire-education-partnership/>
 8. Towers B & Gough A. (2019). *New school: A modern approach to disaster risk reduction and resilience education for children*. In L. Peek (Ed.) *Research Counts: A special collection on children and disasters*. Natural Hazards Centre/US Centre for Disease Control and Prevention. <https://hazards.colorado.edu/news/research-counts/new-school-a-modern-approach-to-disaster-risk-reduction-and-resilience-education-for-children>
 9. Strathewen Arthurs Creek Fire Education Partnership. (2018). *A walk through Strathewen's fire history (film)*. Strathewen Primary School/Arthurs Creek-Strathewen Fire Brigade: Victoria. Available at <https://www.facebook.com/948935338592270/videos/272201230152317/>
 10. O'Donoghue B, Seckold L, Harrison, S, Brereton L, Gravette, R, O'Brien L, Hayward, J. (2019). "We want to show people what kids can do!": A participatory student-led evaluation of the Strathewen-Arthurs Creek Fire Education Partnership. Australian Disaster Resilience Conference, August 28-29, Melbourne.

THE DISASTER RESILIENCE PROJECT: A SCHOOL-BASED FEASIBILITY AND ACCEPTABILITY STUDY

Output Description

To support the delivery of quality DRRRE in Victorian secondary schools, the Country Fire Authority (CFA) and the Victorian State Emergency Service (VicSES), in collaboration with secondary school teachers and students, have developed the Disaster Resilience Project (DRP) - a multi-hazard, teacher-delivered, web-based program for students in Years 7 to 9. The program aims to increase students' knowledge and awareness of local disaster risks and build their capacity for initiating and participating in practical action for disaster risk reduction and resilience.

To assess the feasibility and acceptability of the pilot version of the DRP, the research team conducted an empirical study involving 128 students and 4 teachers in two Victorian secondary schools (Towers et al., 2018). The study adopted an exploratory inductive research design and qualitative research methods that enabled the structure and content of the DRP to be examined from the standpoint of students and teachers. Through an inductive approach which privileged student and teacher voice, we sought to rectify the general exclusion of teachers and students from DRRRE program development and provide them with a platform for directly participating in decision-making relating to program design and implementation.

The feedback provided by teachers and students was overwhelmingly positive. Students reported that the program had provided them with knowledge and skills that they could apply to disaster risk reduction and resilience building activities in their own households and communities. Teachers reported that the program had provided students with valuable learning opportunities that were relevant, meaningful and directly aligned to the formal curriculum. Teachers also reported that the program resources and professional development session had increased their capacity and capability for DRRRE delivery in the classroom. More focused discussions with both students and teachers also identified numerous strengths and weaknesses in relation to specific learning intentions, teaching and learning activities, and methods of assessment.



Importantly, where weaknesses were identified, teachers and students offered valuable recommendations for improvement, and these have now been incorporated into a revised version of the DRP.

Extent of Use

- The final report on feasibility and acceptability study made 25 recommendations for ensuring the effectiveness and scalability of the DRP. These recommendations have been incorporated into a revised version of the DRP.
- The revised version of the DRP is now available for use in Victorian secondary schools and can be accessed at <http://disasterresilience.com.au>
- A system for monitoring the extent of use in schools has not yet been developed. However, a key recommendation of the feasibility and acceptability was that a robust monitoring system be incorporated into any future strategies for scaled implementation.
- Tasmania Fire Service (TFS) have drawn on the structure and content of the DRP to develop a teacher delivered program that is specifically designed for use in Tasmanian schools. TFS are currently trialing the Tasmanian version in high-risk locations across the state.
- All teachers involved in the feasibility and acceptability study of the pilot versions of the DRP reported that they would continue to deliver the program as part of the formal curriculum in their classrooms.

Utilisation Potential

The feasibility and acceptability study concluded that the DRP has the potential to provide all Victorian secondary school students with access to essential knowledge and information which can support their active participation in disaster risk reduction and resilience building activities (Towers et al. 2018). However, the scaled implementation of the DRP will require further investment and commitment from the emergency management and education sectors.

The implementation strategy for the pilot version of the DRP involved a 45-minute face-to-face teacher professional development session delivered by CFA project staff. In this session, project staff familiarised teachers with the website format and functionality and provided a step-by-step guide to lesson delivery. In the feasibility and acceptability study, teachers asserted that program uptake in other schools would be highly dependent on the scaled delivery of those professional development sessions in schools (Towers et al. 2018).

This speaks directly to the importance of collaboration and partnership in the delivery of school-based DRRRE (Towers et al., 2016). Through a teacher-delivered model of implementation, emergency management agencies can substantially increase the delivery of DRREE in schools. However, as indicated in the feasibility and acceptability, the success of this model will likely depend on the provision of guidance and support for teachers. The concept of 'shared responsibility', which underpins the National Strategy for Disaster Resilience



(COAG, 2011), presupposes the need for this kind of collaboration and partnership across all aspects of DRR and resilience, including DRRRE (McLennan & Handmer, 2012).

Utilisation Impact

- The impact of the DRP is yet to be systematically examined. This will require a larger-scale school-based evaluation that investigates program outcomes and impacts over time. However, student and teacher feedback obtained through the feasibility and acceptability study indicated that the DRP had a positive impact on student knowledge, skills, attitudes and behavior, as well as teacher capacity and capability for DRRRE delivery.
- Some reflections from teachers and students who have used the DRP in their classrooms are captured in this short film which features on the DRP website
<https://www.youtube.com/watch?v=kQlmuXZolhs#action=share>
- The DRP was awarded a Highly Commended in the Government category at the 2018 Victorian Disaster Resilience Awards.
- The genuine involvement of students and teachers in program development has been recognised as good practice by the end-user group and will be incorporated into the DRRRE practice framework.

Utilisation and Impact Evidence

1. CFA/SES. (2018). *The Disaster Resilience Project: A web-based resource for Victorian secondary schools*. CFA: East Burwood. Available at <http://disasterresilience.com.au/teachers/>
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FIRE & RESCUE NSW FIRE ED: A REVIEW OF CURRENT PRACTICE

Output Description

As documented in the research literature on housefire injuries and fatalities, children represent highly vulnerable group. A key strategy for reducing this vulnerability involves educating children about house fire safety from a young age. Accordingly, Fire & Rescue New South Wales (F&R NSW) has been actively involved in the delivery of school-based fire safety education in NSW schools for many years. At present, F&R NSW provides fire safety education for preschool and primary school students through a suite of three 'FireEd' programs: 1) 'PreEd' for 3-5 year olds; 2) 'FireEd Level 1' for 5-7 year olds; 3) 'FireEd Level 2' for 10-12 year olds. All three programs are delivered by F&R NSW firefighters in collaboration with teachers and school staff.

The purpose of this practice review was to examine how the PreEd, FireEd Level 1 and FireEd Level 2 programs were being delivered in preschools and primary schools in NSW. The review had three specific objectives: 1) assess the extent to which the various Fire Ed programs were being delivered and identify any factors that influence levels of program delivery; 2) assess the degree to which the various Fire Ed programs were being implemented as intended (program fidelity) and explore localised approaches to program implementation; and 3) examine the effectiveness of the various Fire Ed programs from the perspectives of F&R NSW firefighters and identify any key factors that influence effectiveness.

Data for the review was gathered through in-depth semi-structured interviews with 15 firefighters who have been actively engaged in the delivery of Fire Ed programs. The review found that firefighters highly value school-based Fire Ed and view it as an essential component of their community safety strategy. However, it also identified a range of possible strategies for increasing program delivery, fidelity and effectiveness. These included:

- Developing a school engagement strategy to increase awareness of program availability amongst school leaders and teachers;
- Mapping the learning outcomes of Fire Ed more closely to the NSW school syllabus;
- Providing more professional development and training opportunities for firefighters;
- Encouraging and supporting teachers to deliver introductory learning activities in advance of firefighter visits;
- Developing methods and tools for the assessment of student learning and the application of that learning at home.

Extent of Use

- The results of the practice review have been used by F&R NSW to redevelop the suite of FireEd programs in ways that will support



increased delivery, fidelity and effectiveness. The results have also been used to support the design and implementation of enhanced professional development and training opportunities for F&R NSW firefighters who are involved in program delivery.

- The practice review has also led to an increased appreciation of the valuable contribution that firefighters who are involved in FireEd delivery can make to the continuous improvement of the program design and implementation. This is reflected in the ongoing development of platforms through which firefighters can share their knowledge, perspectives and experiences across the organisation.

Utilisation Potential

- The review has provided the organisation with valuable insight into the factors that influence the delivery, fidelity and effectiveness at the local level. These factors can now be incorporated into the design and application of more rigorous monitoring and evaluation systems for measuring program outputs and outcomes for the purpose of ongoing continuous improvement.

Utilisation Impact

- A primary reason for conducting the practice review was to identify strengths and weaknesses in program design and implementation and make any necessary modifications or improvements before investing resources in a school-based evaluation. In light of the findings and the outcomes of the practice review, this was an advantageous strategy.
- The impact of the practice review on program delivery, fidelity and effectiveness at the local level will require follow-up investigation and analysis. Future school-based evaluations of program implementation and outcomes will constitute an important part of this process.

Utilisation and Impact Evidence

1. Towers B. (2018). *Fire & Rescue NSW Fire Ed: A Review of Current Practice*. Report submitted to Fire and Rescue NSW. Bushfire and Natural Hazards CRC: East Melbourne.



DISASTER RISK REDUCTION AND RESILIENCE EDUCATION: A PRACTICE FRAMEWORK FOR EMERGENCY MANAGEMENT AGENCIES

Output Description

In 2016, the research team collaborated with end-user agencies to develop an evidence-based practice framework for the development and delivery of school-based DRRRE in the Australian national context (see Towers et al., 2016). The purpose of the framework is to provide end-user agencies with evidence-based advice for the development of DRE programs that reduce risk, increase resilience and can be implemented at scale. The framework is comprised of three guiding principles (collaboration and partnership, and three core dimensions (see Figure 1). The structure and content of the framework has been informed by current international and national policy frameworks, existing DRE practice guidelines, published research evidence and extensive consultation with representatives from the emergency management and education sectors.

Extent of Use

The core dimensions and guiding principles that comprise the DRRRE practice framework have been used widely by end-user agencies and other organisations to inform the design, implementation and evaluation of various DRRRE programs, including:

- **Bushfire Patrol**, WA Department of Fire and Emergency Services
- **North West Bushfire Patrol**, WA Department of Fire and Emergency Services
- **Survive and Thrive**, Victorian Country Fire Authority
- **The Disaster Resilience Project**, Victorian Country Fire Authority/Victorian State Emergency Service
- **Pillowcase Project**, Australian Red Cross
- **Triple Zero Kids Challenge**, Triple Zero Working Group
- **Triple Zero Classroom**, NSW Rural Fire Service
- **Guide to Working with School Communities**, NSW Rural Fire Service
- **FireEd**, Fire and Rescue NSW
- **Strathewen Arthurs Creek Fire Education Partnership**, Arthurs Creek Strathewen Fire Brigade/Strathewen Primary School
- **Project-Based Learning for Disaster Risk Reduction and Resilience**, Harkaway Primary School



Utilisation Potential

- The wide application of the practice framework within end-user agencies indicates its value as a guidance tool for evidence-based DRE programming. As such, the framework is now being revised to incorporate new developments in policy, research and practice over the last 3-4 years. This revised version will constitute a core utilisation product for the CCDRR project.
- End-user agencies have also specifically requested for key elements of the practice framework to be transposed into a series of two-page briefs that provide concise summaries of the research evidence and its implications for policy and practice.
- Upon completion, the revised version of the practice framework will provide the foundation for the design and delivery of training and professional development that help build capacity and capability within both the emergency management and education sectors.
- The research team has been invited to present the framework at a wide range of industry forums, seminars and events in almost every State and Territory. These engagements have provided valuable opportunities to not only share the framework with diverse audiences, but gather feedback that can inform the revision process.
- When first drafted in 2016, the purpose of the practice framework was to provide a starting point for critical discussion and debate regarding what constitutes good practice in the design, implementation and evaluation of DRE. To this end, it has achieved its aim. Not only has it provided a platform for discussion and debate amongst our end-user partners, it has also provided a started point for meaningful dialogue with education researchers and practitioners.

Utilisation and Impact Evidence

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NEXT STEPS

In this final year of the project, the focus will shift heavily towards research utilisation. In addition to completing the three core studies, the research team will be focused on redeveloping the DRRRE Practice Framework, which will involve incorporating the findings of the empirical work that has been conducted over the course of the project, as well as the findings from a series of systematic and critical literature reviews that are currently in preparation. In March 2019, the research team and the End-User agencies will convene to review a draft version of the revised DRRRE Practice framework and develop utilisation pathways for the National Framework of DRRRE implementation. The research team will also be presenting research findings and utilisation products at a range of academic and industry forums including the BNHCRC Annual Research Forum, the BNHCRC Research Advisory Forum on Warnings and Communication and various DRANSZEN events, including the National Forum and the SA Forum. The research team welcome all opportunities to work with End-User agencies and other organisations on research utilisation projects and initiatives.



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CONFERENCE PRESENTATIONS, SEMINARS, WORKSHOPS

- 1 Towers B. *Communication, education and behavior (panelist)*. 12th Australasian Natural Hazards Management Conference, Canberra, June 17-19, 2019
- 2 Towers B. *Kids as risk communicators: Amplifying children's voices in disaster risk reduction and resilience*. Facilitated workshop at the Emergency Media and Public Affairs Conference, Sydney, June 3-5, 2019.
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EXTENDED ABSTRACTS

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