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

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EXECUTIVE SUMMARY

BACKGROUND

The aim of school-based Disaster Resilience Education (DRE) is to build students' understanding of the causes, nature and effects of hazards, while also fostering a range of competencies and skills that will enable them to contribute proactively to disaster prevention, mitigation, preparedness, response and recovery. The development and delivery of school-based DRE has been identified as a key priority for action in disaster resilience policy frameworks and strategies from the international to the local level. To support the delivery of the quality DRE 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 DRE 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.

The pilot version of the Disaster Resilience Project (DRP) was informed by extensive consultations with Victorian secondary school teachers, policy frameworks for disaster risk reduction (DRR) and resilience, and the academic literature. It was comprised of a structured set of five lessons designed to guide students through an exploration of key concepts in DRR and resilience, support them to apply those concepts to their own local context, and encourage them to plan and implement a DRR or resilience building activity at home, school or in the wider community. To support the teacher-delivered model of implementation, the pilot version also included a 45-60 minute face-to-face professional development session in which CFA project staff guided teachers through the learning intentions and the teaching and learning activities for each lesson.

STUDY OBJECTIVES, RESEARCH DESIGN AND METHODS

To assess the feasibility and acceptability of the pilot version of the DRP, an empirical study was undertaken in two Victorian Secondary schools. The study had three main objectives: 1) to determine the overall feasibility and acceptability of the DRP as an educational resource; 2) to determine the feasibility and acceptability of the individual lessons and the specific teaching and learning activities comprising those lessons; and 3) to determine the feasibility and acceptability of the teacher-delivered model of implementation. The study was not intended to evaluate the effectiveness of the DRP in terms of student learning outcomes or disaster resilience outcomes, but to inform the merit of the program and to guide design enhancements, which can then be tested in a future effectiveness trial.

The study adopted an exploratory inductive research design and qualitative research methods that enabled the feasibility and acceptability of the DRP to be studied from the standpoint of students and teachers. Students and teachers are rarely afforded any substantive role in the development of DRE programs.



Through an inductive approach, which privileged student and teacher voice, we sought to rectify the general exclusion of teachers and students from DRE program development and provide them with a platform for directly participating in decision-making relating to program design and implementation.

The study was conducted in a Catholic independent school located on the southern fringe of Ballarat and a Victorian Government school located on the eastern side of the Dandenong Ranges. Across the two schools, teachers delivered the DRP to four Year 7 and three Year 8 classes. A total of 128 students from these classes then participated in focus group discussions and four teachers participated in in-depth semi-structured interviews. Both the student focus group discussions and the teacher interviews explored the overall feasibility and acceptability of the DRP, as well as the feasibility and acceptability of the individual lessons and the model of implementation.

KEY FINDINGS AND RECOMMENDATIONS

The general feedback from both teachers and students indicated that overall, the learning activities in the DRP are relevant, meaningful and worthwhile. Students reported that the DRP had provided them with valuable knowledge and skills that would benefit them should they ever confront a major hazard event or disaster. Teachers agreed that the DRP had been highly beneficial for their students and they viewed the program content as having direct utility and applicability in the context of students' own lives.

While the general feedback from teachers and students suggested that DRP was highly beneficial and worthwhile, more focused discussions on the individual lessons identified both 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. These recommendations are summarised below.

Lesson 1: What is Disaster Resilience?

Activity 1: Resilience Challenge

- Revise the quiz to focus the questions on topics that are directly related to disaster resilience.
- Consider designing the quiz as a form of pre/post evaluation and summative assessment.
- Develop a mechanism for providing students with immediate feedback on their quiz responses.
- Explore the extent to which quizzes could be included in other lessons as a means of formative assessment.
- Thoroughly test the functionality of online quiz platforms to ensure effective delivery in the classroom.



Activity 2: Wye River Case study

- Further develop the case study to include more detail of the event and the actions the community took to prepare, respond and recover.
- Incorporate audio-visual materials into the presentation of the case study.
- Based on the revised case study, formulate new questions that will stimulate more vibrant discussions in the classroom.

Lesson 2: Our Local Hazards

Activity 1: Brainstorming hazards

- In the Teacher's Guide, add the option of making the brainstorming activity a competition between groups.

Activity 2: Hazard investigation

- Replace the existing flood video with one that is more suited to the purpose of listing flood impacts.

Activity 3: Your local hazards

- Develop more challenging discussion questions related to the year in which the fire occurred, and its spatial extent, and its proximity to the student's home or school.
- Make the class discussion in the extension activity a core part of the lesson.
- Consider including an extension activity in which students search online for information about past fires or ask older relatives or friends if they have any information about past hazard events in the local area.
- Provide guidance and advice for students whose address is not recognised by the Map/Filter function.
- Advise students that there may be some delay in adding recent fires to the map.

Lesson 3: Disaster vulnerability

Activity 1: Disaster vulnerability case studies

- Reduce the length of the case studies and focus the content on the key factors that increase vulnerability.
- Present the case studies in an audio-visual format with an accompanying audio transcript.
- Include a core activity that encourages students to identify key gaps in knowledge and preparedness that could be making them or their households more vulnerable to hazards impacts.



Lesson 4: Becoming disaster resilient

Activity 1: Animation

- Include a discussion-based activity in which students can share the various activities on their lists and explore some of the key points raised in the animation.
- For each lesson in the program, develop a short animation that provides a concise summary of the key concepts and issues that will be explored in the lesson.

Activity 2: Finding information

- Revise the instructions to teachers and students so that teachers can make their own decisions as to whether students complete the activity independently or in pairs.
- Revise the questions to directly address students' interests and concerns as they relate to early warnings and alerts, emergency preparedness and response, and preparing your property.
- Include a quiz that students can use to test their knowledge at the end of the activity.

Lesson 5: Taking action

Activity 1: Case study of Tilly Smith

- To provide students with a sense of purpose from the beginning of the program, move the case study of Tilly Smith to Lesson 1.
- Consider the inclusion of additional case studies of actions Australian children and young people who have taken to increase disaster resilience in their own local context.

Activity 2: Making an action plan

- Redevelop the activity to focus specifically on the development of a household emergency plan.
- Design the activity to support and facilitate the direct involvement of children's households.
- Provide students with example plans and planning templates but encourage students to design a template that is tailored specifically to their own household context.
- Advise teachers to adopt flexible timeframes for any home-based activities so that households can allocate adequate time for their completion.

Model of implementation

Both students and teachers viewed the teacher-delivered model of implementation as being feasible and acceptable: however, teachers identified



the professional development session as being fundamental to the success of this approach. As such, the professional development session should be retained as a key component of the DRP implementation strategy. Teachers also emphasised the importance of directly aligning the program to the Victorian Curriculum and clearly articulating the curriculum connections on the website. They asserted that failing to make the curriculum connections readily apparent to teachers would represent a threat to scaled implementation and therefore, the curriculum connections should be emphasised in all program materials, including those used for marketing and promotion.

CONCLUSIONS

This study of the DRP, undertaken from the standpoint of students and teachers, found that the program has a high level of feasibility and acceptability. By providing students and teachers with a platform to voice their perspectives on the structure, content and implementation of the DRP, the study also identified the need for numerous modifications and improvements that have the potential to increase student engagement and further enhance student learning outcomes and disaster resilience outcomes. The study has also demonstrated the fundamental importance of amplifying student voice in DRE program development. While the active involvement of students and teachers in decision-making regarding the structure, content and implementation of DRE programs has not been standard practice in Australia or internationally, the insights provided by the students and teachers in this study provide compelling evidence for including them as genuine stakeholders in program development.

Based on the findings of this study, it can be concluded that the DRP constitutes a viable mechanism for the scaled implementation of effective DRE in Victorian secondary schools. While current disaster resilience policy frameworks and recent curriculum reforms provide unprecedented opportunities for the delivery of DRE in schools, the scaled implementation of effective programs has proven a significant challenge. With sufficient investment and commitment from the Victorian emergency management and education sectors, 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 at home, at school, and in the wider community.



INTRODUCTION

“Resilience is like building up like strength to recover from stuff. Knowing that you can go from normal life and having something happen to you and then just going back into that routine again. Like instead of going down and splat, you're going down and back up.”

-Year 7 student, Dandenong Ranges, Victoria

The overarching aim of school-based Disaster Resilience Education (DRE) is to build students' understanding of the causes, nature and effects of hazards, while also fostering a range of competencies and skills that enable them to contribute proactively to disaster prevention, mitigation, preparedness, response and recovery (Johnston et al., 2014; Ronan et al., 2016; Towers et al., 2016, UNESCO/UNICEF 2014). Over the last two decades, empirical research from around the world has demonstrated that DRE can deliver a range of benefits for students and their families, including increased awareness of local hazards and disaster risks, increased levels of household planning and preparedness, increased capacity for emergency response, and reduced hazard-related worries and fears (Amri et al., 2017; Johnson et al., 2014; Ronan et al., 2016; Ronan & Towers, 2014).

In recognition of these wide-ranging benefits, numerous policy frameworks and strategies from the international to the state level have formally recognised school-based DRE as a key mechanism for reducing disaster risk and building resilience. Over a decade ago, the *United Nations Hyogo Framework for Action 2005-2015* identified “the inclusion of disaster risk reduction knowledge in relevant sections of school curricula at all levels” and “the implementation of programmes and activities in schools” as key priorities for action (UNISDR, 2005, p. 10). More recently, the successor to the Hyogo Framework, the *United Nations Sendai Framework for Disaster Risk Reduction 2015-2030*, 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” (UNISDR, 2015, p.23).

At the national level, the importance of school-based DRE is emphasised in the *National Strategy for Disaster Resilience*, which lists the inclusion of risk reduction knowledge in school education programs as a priority outcome (COAG, 2011). In Victoria, the importance of DRE is recognised in the *Victorian Emergency Management Strategic Action Plan 2015-2018* which under ‘Priority A: Community and Business’, identifies the “increased the capacity of local communities to be ready to withstand, and recover from an emergency” as a key objective (State Government of Victoria, 2015, p. 20). The plan also outlines a set of core actions for achieving this objective, including the need to “identify key partnerships across governments, agencies and the public and private school sectors to develop innovative approaches to engage with young people as both learners and educators to build emergency management awareness and capability” (State Government of Victoria, 2015, p. 20).

The importance of DRE has also been recognised at the national and state level through its inclusion in formal school curricula. At the national level, the Australian Curriculum and Assessment Authority (ACARA) has incorporated content descriptions directly related to disaster resilience in the Australian Curriculum for Geography at Grade 5, Year 7, Year 8 and VCE (ACARA, 2018). Importantly, the



Victorian Curriculum and Assessment Authority has incorporated these content descriptions into the Victorian Curriculum (VCAA, 2018). While this inclusion of disaster resilience related content at the national and state level may be partly attributed to the implementation of the Hyogo Framework, it is also important to acknowledge the integral role of the 2009 Victorian Bushfires Royal Commission, which made a formal recommendation regarding the inclusion of bushfire education in the national school curriculum (Teague et al., 2010). Despite being specifically focused on bushfire education, this recommendation provided a solid basis for broader curriculum reform that has encompassed the full spectrum of geophysical, hydrological, meteorological and climatological hazards (ACARA, 2018).

This increased recognition of the importance of DRE at the international, national and state level, combined with the inclusion of relevant content in the formal curriculum, represents an valuable opportunity to ensure that current and future generations of Australian students can gain access to essential knowledge and skills for disaster risk reduction and resilience (Towers et al., 2016). To capitalise on this opportunity, Australian emergency service agencies have developed a range of DRE programs and resources for school-based delivery. However, there has been a particular focus on the primary school years and the development of quality DRE programs and resources for secondary school students has lagged.

Seeking to address this gap in the Victorian context, the Country Fire Authority (CFA) and the Victorian State Emergency Service (VicSES) have collaborated with secondary school teachers and students to develop the 'Disaster Resilience Project'¹ (DRP), a multi-hazard teacher-delivered DRE program which 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 at the local level.

The development of the DRP commenced with a detailed needs assessment involving extensive consultation with approximately 14 school principals and 30 classroom teachers in Victorian secondary schools. These consultations, undertaken by CFA project staff, indicated that teachers recognise the importance of DRE for young people and view schools as having a key role to play in DRE delivery. However, the consultations also revealed that teacher capacity and capability for classroom delivery of DRE was being constrained by a lack of up-to-date, credible, and trustworthy teaching resources. The clear message to emerge from the consultation process was that if the emergency services developed a comprehensive, evidence-based educational resource that reflected contemporary approaches to teaching and learning, which could be implemented as part as of the curriculum, teachers would deliver it.

Consequently, the CFA and VicSES, in collaboration with the Centre for Urban Research at RMIT University and the Bushfire and Natural Hazards Cooperative Research Centre, developed of a pilot version of the DRP, which was then subjected to a school-based feasibility and acceptability study which sought to

¹ Originally titled the 'School Curriculum Natural Hazards Resilience Package' (SCHNRP), the program was renamed the 'Disaster Resilience Project' by the teachers and students who participated in the process of program development.



amplify the voices of Victorian school students and teachers in the development process. This report details the findings of that feasibility and acceptability study and draws on those findings to make a suite of recommendations for enhancing the design and implementation of the DRP.

The report begins by outlining the key features of the pilot version of the DRP and highlighting the importance of student and teacher voice in the development of school-based DRE programs. It then presents the research objectives, research design and methods of data collection for the feasibility and acceptability study. Next, it presents the key findings of the study in conjunction with specific recommendations for program improvement. The report concludes with a discussion of the study's implications for the ongoing development and scaled implementation of the DRP and the importance of involving students and teachers as genuine stakeholders in DRE program development.



BACKGROUND

THE DISASTER RESILIENCE PROJECT

Program structure and content

The structure, content and implementation strategy for the pilot version for the DRP was informed by international, national and state-level frameworks for DRR and resilience, including the UNISDR Sendai Framework for Disaster Risk Reduction 2015-2030 (UNISDR, 2015), the Australian National Strategy for Disaster Resilience (COAG, 2011) and the Victorian Emergency Management Strategic Action Plan 2015-2015 (State Government of Victoria, 2015). It was also informed by the academic literature on hazards and disasters, disaster risk reduction and resilience, and DRE. This resulted in the development of a structured set of five lessons that were intended to guide students through an exploration of key concepts (i.e., disaster risk reduction and resilience, hazard exposure, vulnerability, capacity), support them to apply those concepts to their own local context, and encourage them to plan and implement a DRR or resilience building activity at home, school or in the wider community. The learning intentions and a brief description of teaching and learning activities for each of the five lessons in the pilot version of the DRP are presented in Table 1. The complete set of lesson plans for the pilot version of the DRP is provided in the Appendix.



Table 1: Summary of the five lessons in the Disaster Resilience Project

	Learning intentions	Teaching and learning activities
Lesson 1: What is disaster resilience?	<p>Students understand the meaning of personal resilience and disaster resilience.</p> <p>Students identify personal skills and attributes that can contribute to disaster resilience.</p> <p>Students explain how the Wye River community increased their resilience to the 2015 bushfire.</p>	<p>Activity 1 - Resilience challenge: Students complete a quiz aimed at identifying personal skills and attributes that contribute to personal resilience.</p> <p>Activity 2 - Resilience in Wye river: Students read a case study of the Wye River bushfire and answer a series questions about the event and the factors that contributed to community resilience.</p> <p>Extension activity - Class discussion: Students participate in a class discussion about how resilient their own community would be if a hazard event was to occur.</p>
Lesson 2: Our local hazards	<p>Students identify which hazards are most likely to occur in the local area.</p> <p>Students interpret risk maps to determine which locations could be impacted by a hazard event.</p>	<p>Activity 1 - Brainstorming hazards: Working in small groups, students list as many hazards as they can, then circle the hazards that could occur in their local area.</p> <p>Activity 2 - Hazard investigation: Students watch a video on the impacts of flood, bushfire or storm hazards and list the impacts the hazard can have on people and property.</p> <p>Activity 3 - Your local hazards: Students use the digital mapping tools on the 'Prepare and Get Ready' page on the Vic Emergency website to assess the level of potential hazard exposure for their area, house and school.</p> <p>Extension activity: Students participate in a class discussion about how the activity has changed their view of local hazards and the local hazards most concern to them.</p>
Lesson 3: Disaster vulnerability	<p>Students identify how hazards can impact on people and property.</p> <p>Students identify what makes someone vulnerable to the impacts of a natural hazard.</p> <p>Students explain how a natural hazard can become a natural disaster.</p>	<p>Activity 1 – Disaster vulnerability case studies: Students read a case of the 2009 Black Saturday bushfires or the 2011 Grantham floods. They identify the impacts of the event the factors that made people vulnerable to those impacts.</p>
Lesson 4: Becoming disaster resilient	<p>Students understand their capacity to use skills and resources to reduce hazard impacts and increase resilience.</p> <p>Students can locate information online about what people can do reduce the impacts of hazards.</p>	<p>Activity 1 - Animation: Students watch an animation about the concept of capacity and make list of the various things people can do to protect themselves from natural hazards.</p> <p>Activity 2 - Finding information: Students explore the Vic Emergency website to find important information about preparing, planning for and responding to natural hazard events.</p> <p>Extension activity: Students participate in a class discussion about the concept of capacity and their views regarding the most important things people can do to increase their resilience to natural hazards.</p>
Lesson 5: Taking action	<p>Students identify an achievable disaster resilience activity that could be undertaken at home or at school.</p> <p>Students formulate a plan for their successful completion of their activity.</p> <p>Students identify potential obstacles to the completion of their activity and formulate strategies for overcoming those obstacles.</p>	<p>Activity 1 - Case study of Tilly Smith: Students watch a video about Tilly Smith's and her role in protecting others from the impacts of the Boxing Day tsunami and discuss a series of questions relating to that event.</p> <p>Activity 2 – Disaster Resilience Action Plan: Students choose a hazard that could affect them, decide on an activity they could take to reduce the impacts of that hazard, and develop a plan for implementing that activity.</p> <p>Extension activity - Class discussion: Students discuss how confident they feel about implementing their activity and whether there is anything else they could as class to make their school community more aware of the local hazards.</p>



Curriculum Alignment

It is well established that the curriculum is overcrowded (APPA, 2014; Hudson, 2012) and international studies have repeatedly identified an overcrowded curriculum as a major barrier to the sustained implementation of DRE in schools (Amri et al., 2016; UNESCO/UNICEF, 2014; Renwick, 2012). Therefore, it is essential that school-based DRE programs align directly to the formal curriculum in the relevant jurisdiction (AFAC, 2014; Dufty, 2014; dk2/Australian Red Cross, 2014). For the DRP, this required identifying where the learning intentions and activities were connected to specific learning areas, content descriptions, and elaborations in the Victorian Curriculum for Years 7, 8 and 9. These curriculum connections, which were clearly communicate in the program materials, are presented in Table 2.

Table 2: Victorian curriculum connections for Years 7, 8 and 9.

	Learning strand	Content description	Elaborations
Years 7 and 8	Personal and Social Capability/Development of resilience.	Discuss the range of strategies that could be used to cope with difficult tasks or changing situations.	Defining resilience and adaptability and give examples of how they are displayed. Understanding that people experience situations uniquely, that people may react differently to the same situation. Compiling a list of strategies to guide responses to challenging moments in life.
	Geography/Geographical knowledge/Water in the world.	Causes of an atmospheric or hydrological hazard and its impacts on places, and human responses to it to minimise harmful effects on places in the future.	Explaining the physical causes and the temporal and spatial patterns of an atmospheric or hydrological hazard through a study of either droughts, storms, tropical cyclones or floods. Explaining the economic, environmental and social impacts of a selected atmospheric or hydrological hazard on people and places, and investigating community responses to the hazard.
	Geography/Geographical Knowledge/Landforms and landscapes	Causes of a geomorphological hazard and its impacts on places and human responses to it to minimise harmful effects on places in the future.	Investigating the negative and positive impacts of bushfires on Australian landscapes and ways of responding to the risk and events of bushfires.
Level 9	Personal and Social Capability/Development of resilience.	Analyse the significance of independence and individual responsibility in the completion of challenging tasks	Creating a mind map, drawing connections between independence, individual responsibility and successful completion of a challenging task. Drawing links between the degree of responsibility and their motivation to complete tasks.

Format for program delivery

The five lessons in the pilot version of the DRP were presented in an innovative online delivery format in which teachers and students could address the various

learning intentions through teaching and learning activities focused on Victoria's most prominent hazards of bushfire, flood or storm. For example, in Lesson 1, for 'Activity 2: Your Local Hazards', students could assess local hazard exposure for bushfire or flood (see Figure 1) and in Activity 1 of 'Lesson 3: Disaster Vulnerability' students could explore the concept of disaster vulnerability in the context of the Black Saturday bushfires or the Grantham floods (see Figure 2). This enabled teachers and students to tailor the DRP to their local context and focus their attention on whichever hazard represented the most significant threat to their local community. Thus, while the learning intentions were the same for each lesson, they could be achieved through learning activities that were locally relevant and meaningful for students located in different geographical contexts.

Activity 2: Your local hazards (⌚ 25 minutes)

One of the first steps in becoming disaster resilient is to identify the hazards in the environment where we live, work or travel. Storms, floods and bushfires all present different dangers that we should be aware of in order to keep ourselves safe.

Bushfires **Floods**

In pairs or small groups

1. Go to emergency.vic.gov.au
2. Click on 'Prepare and Get Ready'.
3. Type your school or home address into the search bar
4. Click on Filter. In the drop down menu, select 'Flood likelihood - 100 years'.

Small group discussion

1. What do the blue areas mean?
2. Could other parts of your community be flooded?
3. Could your house or school be flooded in the next 100 years?

Activity 2: Your local hazards (⌚ 25 minutes)

One of the first steps in becoming disaster resilient is to identify the hazards in the environment where we live, work or travel. Storms, floods and bushfires all present different dangers that we should be aware of in order to keep ourselves safe.

Bushfires **Floods**

In pairs or small groups:

1. Go to emergency.vic.gov.au
2. Click on 'Prepare and Get Ready'. Click on 'map'.
3. Type your school or home address into the search bar
4. Click on Filter. In the drop down menu, select 'Bushfire History -50 years'.

Small group discussion

1. What do the red areas mean?
2. Has there been a bushfire in your area in the past 50 years? How close did it come to your school or house?
3. Could there be a bushfire in your area in the future?

Figure 1: Lesson 1 - Activity 2 -Your local hazards



Activity 2: Disaster vulnerability case studies (⌚ 25 minutes)

Flood **Bushfire**

Read the 2011 Grantham, Lockyer Valley Floods case study. In pairs or small groups, discuss and record your responses to the following questions:

- ▶ What were the impacts of the flood?
- ▶ List the reasons why people were vulnerable to the impacts of the flood.

VIEW CASE STUDY

Activity 2: Disaster vulnerability case studies (⌚ 25 minutes)

Flood Bushfire

Read the 2009 Black Saturday bushfires case study. In pairs or small groups, discuss and record your responses to the following questions:

- ▶ What were the impacts of the bushfire?
- ▶ List the reasons why people were vulnerable to the impacts of the bushfire.

VIEW CASE STUDY

Figure 2: Case studies in Lesson 3 - Activity 3 - Disaster Vulnerability

Professional development for teachers

To further support the implementation of the DRP in classrooms, the pilot version included a 45-60 minute face-to-face professional development session in which project staff from the CFA guided teachers through the learning intentions and the teaching and learning activities for each lesson. The aim of the professional development session was to build teacher capability and confidence for program delivery and support the development of trusted relationships between schools and the CFA/SES project staff. Previous research has identified teacher confidence and trusted relationships between schools and emergency services agencies as primary enablers for the implementation of teacher-delivered DRE in schools (Johnston, 2014; Renwick, 2012). Accommodating these factors in the development of the pilot version of the DRP provided a basis for critically examining potential strategies for scaled implementation across the state.

AMPLIFYING STUDENT AND TEACHER VOICE IN DRE PROGRAM DEVELOPMENT

Underpinned by Articles 12 and 13 of the United Nations Convention on the Rights of the Child (UNHCR, 1989), student voice refers to students expressing their opinions and making decisions regarding the planning, implementation, and evaluation of their learning experiences (Mitra, 2008; Rogers, 2005). In essence, student voice involves students *“actively participating in their schools, communities and the education system, contributing to decision making processes and collectively influencing outcomes by putting forward their views, concerns and ideas”* (State Government of Victoria, 2016, p.4). Across research and practice in education, student voice has been identified as having a range



of important benefits for students, including improved academic achievement, increased student engagement and motivation, and enhanced student well-being (Qauglia & Fox, 2018; Fisher et al., 2017; Hattie, 2012; Ruddock, 2007; Mitra, 2008).

Historically, listening to and acting upon student voice has not been a routine part of DRE program development. Most commonly, it has been adults, often located within emergency management agencies, who have controlled decision-making about the objectives, structure and content of DRE programs, while students have been positioned as the passive recipients of the final product. However, this approach does not reflect contemporary policy or practice for quality education. In Victoria, for example, the concept and practice of student voice is both endorsed and actively promoted by the Department of Education and Training, which recognises that “*students have unique perspectives on learning, teaching, and schooling, and should have the opportunity to actively shape their own education*” (State Government of Victoria, 2016, p.4).

Furthermore, the UNISDR Sendai Framework states that “*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*” (UNISDR, 2015, p.10). In practical terms, this compels government funded emergency management agencies, such as the CFA and VicSES, to directly engage with children and youth in the implementation of policies, plans and standards for school-based DRE. By extension, it requires that students have a voice in the development of the DRE programs and resources that agencies produce.

The inclusion of student voice in the development of DRE programs represents a major paradigm shift for emergency management agencies in both Australia and internationally. Across the rapidly growing international literature on DRE, examples whereby government agencies have afforded students any formal decision-making power in program development are rare. Equally problematic is that teacher voice has also been largely excluded from decision-making processes (for a rare exception see Johnson, 2011). For teacher-delivered DRE, this represents a major concern. If programs do not align with the professional standards and priorities of teachers, sustained delivery in schools is unlikely. This school-based feasibility and acceptability study sought to rectify these issues by amplifying student and teacher voice in the development of the DRP. In doing so, it has provided valuable empirical evidence that can be usefully applied to the improvement of the DRP. It has also demonstrated the fundamental importance of student and teacher voice for the development of school-based DRE programs, more broadly.



RESEARCH APPROACH

STUDY OBJECTIVES AND RESEARCH DESIGN

The study had three main objectives:

1. To determine the overall feasibility and acceptability of the DRP as an educational resource.
2. To determine the feasibility and acceptability of the individual lessons and the specific teaching and learning activities comprising those lessons.
3. To determine the feasibility and acceptability of the teacher-delivered model of implementation.

The study was not intended to evaluate the effectiveness of the DRP with regards to student learning outcomes or disaster resilience outcomes, but to inform the merit of the program and to guide design enhancements, which can then be tested in a future effectiveness trial.

The study adopted an exploratory inductive research design that enabled the feasibility and acceptability of the DRP to be studied from the standpoint of students and teachers. As noted previously, students and teachers are rarely afforded any substantive role in the development of DRE programs. By applying an inductive approach to the study, we sought to rectify the general exclusion of teacher and student perspectives from DRE program development and provide them with a platform for directly participating in decision-making regarding program objectives and learning intentions, teaching and learning activities, methods of assessment and the model of implementation.

RESEARCH METHODS

Setting, participants and recruitment

The study was conducted in two Victorian secondary schools. The first was a Catholic Independent school located on the southern fringe of Ballarat. The second was a Victorian Government school located on the eastern flank of the Dandenong Ranges. Both schools are situated in areas identified by the CFA as having an extreme bushfire risk and the Ballarat school is also located near a creek that is at risk of flash flooding during heavy storms and prolonged rainfall events. Both schools are also located in areas with a high likelihood of severe storms.

Staff at both participating schools had been involved in the consultation process that had informed the design and implementation strategy for the pilot version DRP. In the Ballarat school, the DRP was delivered in three separate year 8 classes. In the Dandenong Ranges school, it was delivered in four separate year 7 classes. At both schools, the DRP was implemented as part of the *Geographical Knowledge* strand in formal Victorian Geography curriculum. In Ballarat, it was implemented as part of the sub-strand for *Landforms and Landscapes*, while in



the Dandenong Ranges it was implemented as part of the sub-strands for *Water in the World* and *Places and Liveability*.

Students in participating classes were recruited for the study via Participant Information Sheets that were distributed by classroom teachers. Students willing to volunteer for study were required to provide signed parental consent, as well as their own signed consent. Teachers in participating classes were recruited via a Participant Information Sheet and were also required to provide signed consent.

In total, 128 students and four teachers participated in the study. In Ballarat, participants included 56 Year 8 students and two teachers. In the Dandenong Ranges, participants included 72 Year 7 students and two teachers.

Amongst the student participants, the gender ratio approached 1:1 with 62 girls and 66 boys. The gender ratio for teachers was 1:1 with two males and two females.

Ethical approval for the study was obtained from the RMIT Science, Engineering and Technology College Human Ethics Advisory Network. Approval to conduct the study in the participating schools was obtained from the Victorian Department of Education and the Catholic Diocese of Ballarat.

DATA COLLECTION AND ANALYSIS

Focus group discussions with students

To assess the feasibility and acceptability of the DRP from the standpoint of students, semi-structured Focus Group Discussions (FDG) were conducted with students upon completion of the program. In the Dandenong ranges, 15 separate FDGs were conducted with groups of 4 to 7 students. In Ballarat, 8 separate FDGs were conducted and while most of the groups were comprised of 4 to 7 students, timetabling constraints meant that two of the groups were comprised of 10 students each. At both schools, the FDGs were conducted during class time in a meeting room, a spare classroom or the cafeteria.

In each FDG, students were asked a series of questions about past exposure to school-based disaster resilience education, the overall feasibility and acceptability of the DRP, and the feasibility and acceptability of the individual lessons and learning activities. To facilitate discussion, students were provided with a hard copy of the five DRP lessons as they appear on the program website. Students were also asked to discuss the feasibility and acceptability of the model of implementation, particularly in relation to the teacher-delivered approach.

The FDGs with students ran for approximately 50-60 minutes. All FDGs were audio recorded and transcribed verbatim for analysis. The complete transcripts were then analysed in NVIVO using a thematic coding method, which allowed for the identification and categorisation of major themes across the data (Gibbs 2007).

Interviews with teachers

To assess the feasibility and acceptability of the DRP from the standpoint of teachers, semi-structured interviews were conducted with teachers upon



completion of the program. Two teachers participated in individual interviews via telephone, while another two teachers chose to be interviewed together at the school.

In each interview, teachers were asked a series of questions relating to their past experiences of delivering DRE in the classroom, the overall feasibility and acceptability of the DRP and the feasibility and acceptability of the individual lessons and learning activities. Teachers were also asked about their views on the model of implementation, particularly as it related to the professional development session and other support that was provided by the project partners.

Interviews with teachers ran for approximately 50-60 minutes. All interviews were audio recorded and transcribed verbatim for analysis. The interview transcripts were then analysed in NVIVO using a thematic coding method (Gibbs 2007), which allowed for the identification and categorisation of major concepts and themes across the data.



KEY FINDINGS AND RECOMMENDATIONS

Overall feasibility and acceptability of the program

The general feedback from both teachers and students indicated that overall, the learning activities in the DRP are relevant, meaningful and worthwhile. When asked if they had gained anything from participating in the DRP, students commonly responded that they had acquired valuable knowledge and skills that would benefit them should they ever confront a major hazard event or disaster.

"I think it makes you more aware of the things you need to do because sometimes people can forget. They're like, 'There hasn't been a fire in ages' and 'We won't have a fire.'"

-Year 7 student, Dandenong Ranges

S1: We know how to prepare ourselves for it.

S2: Yeah, if it happened. I wouldn't have really known what to do, but now I probably do.

-Year 7 student, Dandenong Ranges

"I actually learnt something! I actually found out a fair bit of stuff about disaster. What can happen in a fire, in a flood. Like what to do and what you should *really* do. Like, I would've just played in a flood! Now I wouldn't. If there was a fire, I'd probably know what to do a bit more as well."

-Year 8 student, Ballarat

"I liked the program because it helped me to become more aware of disaster resilience and now I know how to be prepared for when disaster happens."

-Year 8 student, Ballarat

Moreover, many of the students felt that they would be able to use their knowledge to educate and help others, including their parents.

S1: When we know as kids it's better. The parents aren't the only ones that know how to do stuff because we can tell the parents that they're doing something wrong.

S2: Yeah, you can make sure they've got a bushfire plan and stuff.

S3: Or make one if you don't have one.

-Year 7 students, Dandenong Ranges

"It's good because even parents might not know about some of these things."

-Year 7 student, Dandenong Ranges

"We learnt to stay well clear of flooded areas because people always underestimate the power of the current. We have great knowledge of disasters now. Our knowledge can help other people."

-Year 8 student, Ballarat



Teachers agreed that the DRP had been highly beneficial for their students and they viewed the program content as having direct utility and applicability in the context of their students' own lives.

"The other positive is the value of the content. You know, it's really valuable stuff. It's so important for them...It's part of developing an overall resilience I think. It comes under that umbrella really. It's just one other element to being able to bounce back from difficult situations. And maybe the sort of things they can learn through it, they can apply to other situations as well."

-Teacher, Dandenong ranges

"Previous to us looking at it, it wouldn't have been something that was on my radar I guess, like something that we would have looked at in the past. But once we've gone through it, I can see *why* it's important and, and why you can't just assume that kids know what to do or will have the maturity or the know-how of what to do in a situation where there is a disaster."

-Teacher, Ballarat

Like the students, teachers also felt that the DRP can provide young people with the knowledge and skills they need to initiate and participate in discussions and activities in their households.

"Even if it's one or two kids that go home and talk to their parents about it, well then it's increased [resilience] really. I think you certainly get students that look into it more deeply and maybe go home and have those discussions with their parents and say, 'Do you realise this?' and 'What are we going to do?' and that that might make their parents think and start implementing or looking into their own management plan as well. So I suppose, even if it reaches one or two, then that's something."

-Teacher, Ballarat

Importantly, the teachers themselves found the program content and activities interesting and engaging and, as one teacher pointed out, this exerted a strong influence on the student learning experience.

"One of the things with teaching, when we're delivering something, if we're not interested in it or we find it boring, we don't tend to do a good job of it either. But if we're interested enough and we see the worthiness of it, then it makes it better for the kids too. And so obviously that's come through. I enjoy teaching it. And I find it interesting and I like watching all those disaster videos and stuff, so I could show them things all day long and talk about it. That was just me, but I'm assuming other people probably would have been the same."

-Teacher, Ballarat

As testament to the overall feasibility of the program, all of the teachers stated that they were planning to deliver the program again the following year. Some of the students also advocated for the scaled delivery of the program in all schools, particularly those located in high-risk areas.



S1: Every kid should learn about this, just in case they come across the same disaster.

S2: I think it should be a theme that gets bigger and bigger, this Disaster Resilience Project.

Interviewer: What do you mean bigger and bigger?

S1: Like until it becomes a main project.

Interviewer: So, you do more work on it as you go through High School?

S1: No, I'm talking about Year 7s, but through every school.

Interviewer: So, you think every school should do this program?

All: Yeah.

S1: I think it would be really good.

S2: Yeah that could protect more lives from fires and things.

-Year 7 students, Dandenong Ranges

Interviewer: If you were a teacher, would you teach this program to your students in year 7?

All students: Yes!

S1: Because they need to know all that, especially in an area like this where it's very bushy.

S2: I would because it's nice for people to know in case you get split up and you're alone.

So that if you're alone, you know what you actually have to do and you don't rely on other people.

-Year 7 students, Dandenong Ranges

FEASIBILITY AND ACCEPTABILITY OF INDIVIDUAL LESSONS AND LEARNING ACTIVITIES

While the general feedback from teachers and students suggested that DRP was highly beneficial and worthwhile, more focussed discussions about the individual lessons identified both 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. A detailed analysis of student and teacher feedback on the specific teaching and learning activities and the associated recommendations for improvement are presented below.

Lesson 1: What is Disaster Resilience?

The aim of this lesson was to introduce students to the concepts of personal resilience and disaster resilience through an exploration of real-life examples. The lesson was comprised of two learning activities designed to achieve three specific learning intentions:

- Understand the meaning of personal resilience and disaster resilience.
- Identify personal skills and attributes that can contribute to disaster resilience.
- Explain how the Wye River community increased their resilience to the 2015 bushfire.

Activity 1: Resilience challenge

In this activity, students worked in pairs to complete a short quiz which sought to frame resilience as something that 'can be learned and developed in everyone'. The quiz contained a series of "Have you ever...?" questions concerning personal



achievements and accomplishments that might indicate a degree of individual resilience (e.g., “Have you ever found a task difficult but kept on trying?”). At the end of the quiz, students then selected one of their past achievements or accomplishments from the list and identified the personal skills or attributes that had enabled them to succeed in that task.

Students appreciated the social dimension of this activity. They enjoyed asking each other the questions and having an opportunity to learn more about their classmates.

“It was fun talking to people seeing what they’d done. Finding out what you thought was normal, some people have never done”.

-Year 8 student, Ballarat

Teachers also noted the value of beginning the program with an activity like this because it positions the students at the centre of the learning process which, in turn, increases student engagement and makes learning meaningful.

“They like to talk about themselves. They do. It’s what all teachers say. Well, it makes it real for them and that’s what we want”.

-Teacher, Ballarat

However, students struggled to see how the quiz questions were relevant to the topic of disaster resilience and there was substantial confusion regarding the purpose or intent of the activity.

“I didn’t really feel that it had much to do with disaster resilience. I understand it’s about resilience but I didn’t really feel like it tied in to the whole disaster thing of it all”.

-Year 8 student, Ballarat

Some of the teachers agreed that the focus on personal achievements and accomplishments had been confusing for students and that making the link between individual resilience and disaster resilience had required a lengthy class discussion. As one teacher pointed out, there was a risk that not all teachers would have the time and inclination to ensure that students were making that link:

“They don’t just ‘get it’. And that’s where depending on the sort of teacher you are, whether you’re going to explain that explicitly or whether just skip over it and go, ‘Oh well, there you go. Next.’”

-Teacher, Ballarat

While students and teachers identified problems with the specific quiz questions, there was strong support for retaining this activity, so long as the quiz questions are directly related to the broader program content. Students asserted that the questions should still be focused on their own personal experience, but that the focus should be on their personal experience of hazards, disasters and disaster resilience:



“With this question: ‘Do you have a pet dog at home that you feed and care for?’ I think it needs to be based on actual disaster stuff like ‘Have you ever dealt with a fire?’”

-Year 7 student, Dandenong Ranges

Students held the view that questions more directly related the topic of disaster resilience would provide them with an opportunity to reflect on their existing knowledge, skills and capacities, and would help them to identify potential gaps. Some students also suggested that the quiz could include questions about current levels of planning and preparedness in their households. Some possible quiz questions suggested by the students included:

- Do you think your house could be affected by flood or a bushfire?
- Do you have an emergency plan at home?
- Do you know what you’re meant to do in a bushfire?
- What would you do in this particular situation?
- Have you ever had to evacuate?
- Have you ever been in an emergency situation?

Teachers also suggested that questions about students’ personal skills and attributes would be appropriate if they were directly related to their existing capacities for preparing for or responding to emergencies (e.g., “Are you able to stay focussed in stressful situations?” “Have you ever taught your parents something they didn’t already know?”).

One group of students also suggested that the quiz could be administered at both the beginning and the end of the program to provide students with an indication of how their knowledge and skills have increased because of the program.

“At the start of the program, you could have like a scenario and then all the questions, and you had to answer them, like not knowing anything and then at the end of the program, you could have the same one, but then compare it to what you know now”.

-Year 8 student, Ballarat

Teachers agreed that a pre- and post-quiz would be a valuable addition to the program and could be also used as a form of summative assessment.

“If they did the resilience little survey at the start and if it’s based on all things hazards, it will probably give them not a great mark. And so, you can see, well obviously you don’t know a whole lot. And then going through the whole unit and then at the end if they do a, “Here’s a scenario. What would you do?”, it basically consolidates, this is how much you’ve learnt, look at how much you’ve learnt. So, it’s almost like this form of assessment to show that too.”

-Teacher, Ballarat

A pre- and post-quiz could also provide valuable mechanism through which the CFA/SES could collect important monitoring and evaluation data on program outcomes.



One teacher also suggested that providing students with a score for the quiz would further increase levels of student engagement. She noted that in its current form, the quiz doesn't provide students with any feedback about the current status of their knowledge or skills and she felt that some kind of feedback mechanism would be beneficial:

"So, with that one - "Am I resilient?"- it could be a good to say, "Have you done all these things?" Or, "How do you react to certain situations?" And then pull out, like a one to ten, 'You are resilient', like, you know? So, they can sort of give themselves a bit of a score on how resilient they are".

-Teacher, Ballarat

Some students also suggested that a quiz should be developed for each lesson. The inclusion of additional quizzes throughout the lessons could potentially provide a valuable form of formative assessment and provide students with a mechanism for monitoring their own learning. Again, it could also provide the CFA/SES with valuable monitoring and evaluation data on program outcomes.

Another weakness in this activity was related to the technical functionality of the quiz. Many students reported difficulties in completing the quiz because the online version would only allow them to tick a certain number of boxes. If quizzes are to be included in the revised version of the program, it will be important to thoroughly test the technical functionality of the online format.

Key recommendations for Activity 1: Resilience Challenge

- Revise the quiz to focus the questions on topics that are directly related to disaster resilience.
- Consider designing the quiz as a form of pre/post evaluation and summative assessment.
- Develop a mechanism for providing students with immediate feedback on their quiz responses.
- Explore the extent to which quizzes could be included in other lessons as a means of formative assessment.
- Thoroughly test the functionality of online quiz platforms to ensure effective delivery in the classroom.

Activity 2: Resilience in Wye River

In this activity, students read a short case study about the 2015 Wye River bushfire and answered a series of questions about the factors that contributed to effective emergency response and recovery within the community. They also engaged in a class discussion about how resilient their own households and communities would be, if they were impacted by a hazard event.

Students widely agreed that the Wye River case study provided a good introduction to the concept of disaster resilience. Most students reported that the



case study was interesting and that it provided some important insights into the kinds of actions and decisions that contribute to disaster resilience.

"I thought it was interesting to see that some communities knew what was happening and they were all prepared earlier and knew that if they got out of there, no one would be injured".

-Year 8 student, Ballarat

Students also agreed that beginning the program with a case study of disaster resilience was preferable to beginning with a case study of a catastrophic disaster. Some students explained that it was refreshing to learn of a major hazard event in which fatalities and injuries had been completely avoided.

"I was really surprised at how prepared they are because whenever there's a fire, you'll always hear that someone died or something or got injured. And no one even got injured in the Wye River one. I was really surprised and stuff and found it interesting".

-Year 7 student, Dandenong Ranges

Others felt that beginning the program with a case study about a major disaster could have a negative emotional impact on students, whereas a case study about disaster resilience can help them to approach their inquiry into hazards and disasters from a more optimistic standpoint.

"Maybe [a story of disaster] will scare some people a little bit and instead of thinking about what they can do they're thinking they're just going to die and get hurt."

-Year 7 student, Dandenong Ranges

"You want the good news before the bad news. You want good news, bad news, good news."

-Year 7 student, Dandenong Ranges

"It gives you a sense that it is possible to do it and like some people they can't do something until they know it's possible".

-Year 7 student, Dandenong Ranges

Students also appreciated that the case study was drawn from a recent event that occurred in the local Victorian context, which increased its relevance to their own lives.

"It shows what some people have *actually* gone through and what *actual* things have happened and *could* happen and how to prevent them."

-Year 7 student, Dandenong Ranges

"It's like a realisation of 'Actually, there *has* been something like this that recently has occurred'. It's not just a story."

-Year 7 student, Dandenong Ranges

"It's pretty recent as well. So, it's kind of what we would do *now*."

-Year 8 student, Ballarat



While the students were strongly supportive of introducing the concept of disaster resilience through the Wye River case study, they also identified several weaknesses in the learning activity. Firstly, they wanted access to a greater level of detail about the Wye River fire and the specific steps the community had taken to reduce losses and increase resilience.

“Maybe it just needed like some more examples of what their plans were. Like how they were prepared...Maybe like steps of what they did to prepare. Not just saying ‘They prepared.’

-Year 8 student, Ballarat

“We don’t know how they [the community members] spread the word about it or how they actually took action.”

-Year 8 student, Ballarat

Students also felt that the lack of detail made it difficult to provide considered answers to the discussion questions:

“I think it was a good activity, except like maybe with a few of the questions where they said it briefly in the text, like a couple of seconds, and then we couldn’t really the answer question, you know? It was just a bit like I’m kind of guessing some of it.”

-Year 7 student, Dandenong Ranges

“With some of the questions there wasn’t enough information there. I was just guessing that that’s why they did it and that could be incorrect.”

-Year 7 student, Dandenong Ranges

Some students also suggested that the questions were somewhat repetitive and could be crafted in a way that generates more reflection and discussion. One of the teachers also provided this feedback based on her own experience in the classroom.

“I found the questions a bit repetitive. When the kids were doing them they were like, “Oh, I’ve already really answered that. I’ve already said that.” So, it was good in terms of starting to talk about the fact that you could have [an event like that], but they just found the questions were a little bit repetitive.”

-Teacher, Dandenong Ranges

Another teacher suggested that some additional questions about how the community might have felt at different points during the event would also serve to elicit interesting classroom discussions.

“Would it be appropriate at that stage to, for them to say, “How do you think the people felt?” Would it be, would that be the right time to do it? Because we’re talking about bouncing back from fears and things like that so maybe they should be considering what the people felt like when they were in that situation.”

-Teacher, Dandenong Ranges

One of the major weaknesses identified by the students was related to the written format of the case study. They suggested it should be presented in an audio-



visual format, which they asserted would be far more engaging and provide students with much greater insight into the event.

"I think probably the best for kids in this day and age is probably videos and stuff because you know people use them more than reading newspapers, and it's just kind of more intriguing than reading."

-Year 7 student, Dandenong Ranges

"I do like reading books but also with movies, like films and stuff, I also like doing them because if I'm not like feeling 100% that day I don't have to think about how it would be and that, because I can see it."

-Year 7 student, Dandenong Ranges

"Probably a video would help. It would help to understand it a little bit more."

-Year 8 student, Ballarat

One student also noted that an audio-visual format would be more inclusive of students of with lower literacy skills.

"I guess if you're not like a confident reader or anything, if you watched a video you could understand it more if you didn't understand what was going on."

-Year 7 student, Dandenong Ranges

Another student suggested that it would also be useful to include a map to provide students with a better understanding of where the event took place. He was unclear about the location of Wye River and felt it was important to be able to place the town in its geographical context.

"It says 'Oh it's Wye River and Separation Creek, but if you read at the start it says Great Ocean Road. It's just so small you could easily miss it. So, you don't know where it actually is".

-Year 7 student, Dandenong Ranges

Teachers agreed that adding more detail to the case study and presenting it in an audio-visual format would have a positive impact on student learning and engagement. Indeed, teachers at both schools had sought out additional audio-visual materials online so they could provide their students with a more detailed understanding of the event.

"If there's any footage or videos or anything, the kids love all that stuff. I mean basically, it was a very small passage and it was a bit of a comprehension task I guess for them, even if you had a slideshow of photos that were attached to it or a short clip. I ended up going onto YouTube to try and find the news clip of it to see if we could look at what happened. It kind of assumes that you already know about it and so I had to explain [more about it], because I knew about that fire, a little bit more about it, and I had to explain more about that to them."

-Teacher, Ballarat

Key recommendations for Activity 2: Wye River Case study

- Further develop the case study to include more detail of the event and the actions the community took to prepare, respond and recover.
- Incorporate audio-visual materials into the presentation of the case study.
- Based on the revised case study, formulate new questions that will stimulate more vibrant discussions in the classroom.

Lesson 2: Our Local Hazards

The aim of this lesson was for students to increase their knowledge and awareness of their local hazards and assess the potential hazard exposure for their own household, school and community. An additional aim of the lesson was for students to identify the various impacts that bushfires, floods and storms can have on people and property. The lesson was comprised of three learning activities designed to achieve two specific learning intentions:

- Identify which hazards are most likely to occur in your local area.
- Interpret risk maps to determine which locations could be impacted by a hazard event.
- Identify the various impacts that hazards can have on individuals, households and communities.

Activity 1: Brainstorming hazards

In this activity, students worked in groups to list as many types as hazards as they could and then identified the specific hazards that were most likely to occur in their own local area. Student and teacher feedback on this activity was overwhelmingly positive. Students enjoyed the activity because it gave them an opportunity to be imaginative, interact with their peers and share their ideas:

"That [activity] was awesome because some people put outrageous things like meteor strikes and dinosaur attacks. Yeah, it was fun!"

-Year 7 student, Dandenong Ranges

"It was something different in class besides the other stuff. I guess it's because there's no right or wrong answers. You're just sharing your own ideas."

-Year 7 student, Dandenong Ranges

"I thought it was good that you work in groups so then you can all share ideas instead of you just working on your own."

-Year 8 student, Ballarat



Teachers agreed that this activity had been highly engaging for students and had stimulated interesting discussions and debates in the classroom:

“We had black holes and all sorts of things! But they liked it. They really engaged in it. I spent more time on that than what I probably should have because it brought up some really interesting discussion.”

-Teacher, Dandenong Ranges

The students also viewed this activity as a highly effective means by which to increase their awareness of their local hazards. Many of the students reported that they had never really thought about or discussed their local hazards before.

“Some of the ones we talked about I didn't know that would actually happens to us.”

-Year 7 student, Dandenong Ranges

“It definitely makes you think and go ‘Oh! I just realised that this could happen to me!’”

-Year 7 student, Dandenong Ranges

“It was probably the first time we actually sat down and talked about it. So, we'd never really actually had the conversation.”

-Year 8 student, Ballarat

“It kind of gives everyone a good idea of what hazards actually happened. [Because] they don't really think about them.”

-Year 8 student, Ballarat

“Like, if you don't do it [the activity], you don't really think about it. You're like ‘Oh yeah, whatever.’ And then you do it and you're like, ‘Oh! Wait! Hang on!’”

-Year 8 student, Ballarat

One student, who had only recently moved to the area from a low-risk suburb, very clearly articulated the value of this activity from her own personal perspective:

“Well, for me, I've just moved here, so I don't know anything about it. So, learning about fires around here and stuff is good. I guess because it's like I used to live in the suburbs, so I guess it's like waking me up and realising that I live around hills and trees now.”

-Year 7 student, Dandenong Ranges

Another student suggested that identifying and ranking hazards increased the personal relevance of subsequent lessons and imbued the practical activities with meaning and purpose.

“Later on, it says like make an action plan and stuff, so it's good to know what you're actually making an action plan for because when we listed everything, we did a brief discussion about what everything was. Because there's no point making an action plan for a tsunami if we live in Ballarat!”

-Year 8 student, Ballarat



Students had very few suggestions for how this activity could be improved. Most said they would not change it all. However, some students did think that it could be made more exciting by setting it up as a competition in which groups compete to list the highest number of hazards. This suggestion could be added to the Teacher's guide as a possible option.

"Just make it a bit more like, able to do more and make it like a bit more trickier. Maybe you could make it like into a game or something. Like which group gets the most."

-Year 7 student, Dandenong Ranges

"We could make it into a sort of like a game, so a competition sort of thing. So, you're in a group and you had to list as many things as you could, and whoever listed as many ones and whoever listed as many as could happen here won."

-Year 7 student, Dandenong Ranges

Key recommendations for Activity 1: Brainstorming hazards

- In the Teacher's Guide, add the option of making the brainstorming activity a competition between groups.

Activity 2: Hazard investigation

In this activity, students watched short videos about past hazard events (i.e., bushfire, flood and storm) and listed the impacts of those events on people and property. There was wide consensus amongst the students that the videos were informative and interesting, and some students reported that this was the first time they had thought about or discussed the impacts that hazards can have on people and property.

"The bushfire one was very informative because it told you how many people died and stuff and how many homes were destroyed and all that."

-Year 7 student, Dandenong Ranges

"It was interesting hearing what they what they had to say."

-Year 7 student, Dandenong Ranges

"This is the first time that I've probably thought about all the stuff that can actually happen. Yeah. Just examples of what could happen. Like, what *did* happen?"

-Year 8 student, Ballarat

In the interviews, students were asked how they felt about being exposed to information about the more extreme hazard impacts of death, injury and property loss. The consensus amongst the students was that understanding these impacts was an integral part of the learning process. They explained that while learning about hazard impacts can be confronting, it serves to emphasise the importance of planning and preparing in advance of a hazard event. They also



explained how realising the potential for extreme hazard impacts had increased their own motivation for taking action.

“You’re telling these kids so they now know that in a situation like this, they do know what to do. They know that if they don’t do anything, it will be bad, but if they can help in any way it will be great.”

-Year 7 student, Dandenong Ranges

“Knowing what happens to other people can help you make decisions about what you [can do]. It’s like learning from mistakes. Because some people make the mistake of staying at their houses and other people hearing their mistakes, then they won’t make the same mistake.”

-Year 7 student, Dandenong Ranges

“It was devastating for the people who went through what they had to go through, but it kind of showed us that there’s people out there having this done to them and we’re just sitting here and we’re not doing anything about it!”

-Year 7 student, Dandenong Ranges

“That’s pretty good because its warning you and making sure you’re always prepared...It was a little bit shocking that that many people died...But it still really told me to do something about it.”

-Year 8 student, Ballarat

“It’s like an awakening just to realise what could actually possibly happen... So, then it gets you more prepared. Like, where you lose your things, you could put the most important things into like a safe or something or grab them as you’re evacuating.”

-Year 8 student, Ballarat

In some of the focus groups, students were specifically asked if learning about extreme hazard impacts had made them feel worried or afraid. In response, students explained that because they had learned key strategies for preventing or mitigating those impacts, it provided an increased sense of safety.

“It probably made me feel safer doing this because like we learnt what to do if it does happen.”

-Year 7 student, Dandenong Ranges

“I wasn’t freaked out because I knew if I did this program I would expand my knowledge and I could try to prevent it...It didn’t scare me, no. I didn’t freak out.”

-Year 7 student, Dandenong Ranges

“You feel safe because you know what to do and you’ve made an action plan for yourself.”

-Year 8 student, Ballarat

“It can teach you life-skills...because if you’re in that situation at that time of the year and you don’t know what to do, you’re more anxious.”

-Year 8 student, Ballarat



While the students generally found the videos interesting and informative, there was some feedback that for the purpose of understanding hazard impacts, the flood video could be improved. They felt that the bushfire video provided useful information about the specific impacts of major disasters (i.e. number of fatalities, injuries, scale of property losses), but the flood video lacked this detail.

"I reckon the floods one might have needed more information, but the bushfire one was definitely the one that had the most [information]."

-Year 7 student, Dandenong Ranges

"We learnt a lot about the bushfires but like the floods one we don't learn as much...It informed us but like not as much as the bushfires one."

-Year 7 student, Dandenong Ranges

"I think they're both informative. The better one was the bushfire one...I don't know, it just had a lot more examples."

-Year 7 student, Dandenong Ranges

It is the case that the bushfire video discusses the impacts of three major bushfire disasters - Black Friday in 1939, Ash Wednesday in 1983, and Black Saturday in 2009 - and provides specific details on the number fatalities and injuries, the number of houses destroyed, and the scale of livestock losses. By contrast, the flood video explores some major flooding events from the perspectives of local residents and then presents some advice on flood preparedness, but it does not consistently provide facts or figures on the extent of damage or loss. As such, the flood video may not be well suited to the purpose of 'listing hazard impacts'.

Key recommendations for Activity 2: Hazard investigation

- Replace the existing flood video with one that is more suited to the purpose of listing flood impacts.

Activity 3: Your local hazards

In this activity, students used the Map/Filter function on the 'Prepare and Get Ready' page of the Vic Emergency website (www.emergency.gov.au/prepare) to investigate potential hazard exposure for their local area and their own house and school. By typing in their address, they could assess whether there had been a bushfire in their area within in last 50 years, and if so, could determine how close it had come to their house or school. They were also able to observe the likelihood of their area flooding within a 100-year period and determine whether their house or school could be inundated.

Students reported extremely high levels of engagement with his activity and many of them identified it as their favourite activity in the program.



"I think it was pretty fun because we went around and we kept telling them how far away you were."

-Year 7 student, Dandenong Ranges

"You put your [address] in and it shows the red areas where there was a bushfire something like 50 years back... Yeah, it was really interesting."

-Year 7 student, Dandenong Ranges

"That was my favourite activity because you got to interact and you got to see your house and you got to see if there had been a fire near you or surrounding."

-Year 7 student, Dandenong Ranges

Students valued the interactive nature of the activity and there was wide consensus that it had been a highly effective means by which to increase their awareness of their own potential exposure to a hazard event.

"It was good because you could see that a bushfire had been through your area and it made you aware that it could happen again - that it's a possibility."

-Year 7 student, Dandenong Ranges

"We got to know what the risks were and how close it was to us -to know that it could happen to us."

-Year 7 student, Dandenong Ranges

"It's definitely [beneficial] because it shows you that it can definitely come there."

-Year 7 student, Dandenong Ranges

S1: Yeah, it's good because then you know if you're in danger.

S2: Yeah, you know like the area, where there's the most potential hazards and the less potential places that would have fires and floods.

-Year 8 students, Ballarat

"We found out that we were actually quite vulnerable and stuff...You usually just assume that you're safe, so it was a big thing that we're not safe."

-Year 8 student, Ballarat

Many students reported that prior to completing this activity their awareness of their own potential exposure to a hazard event had been very low. In the case of bushfire, many of the students in the Dandenong ranges had been previously unaware of the local fire history and had been surprised to learn that past fires had burned within such close proximity to their own properties.

"I knew the fire came close, but I didn't know that it came that close!"

-Year 7 student, Dandenong Ranges

"It was pretty good to see how close the fires were to your house. I didn't know there were fires right near my house, like 1997 or 67 around then."

-Year 7 student, Dandenong Ranges



"I noticed that bushfires were a lot closer to my home than I expected. Because I haven't really experienced a big bushfire or any really big bushfire ever. So, I think it's good to know it can happen."

-Year 7 student, Dandenong Ranges

"In our class we looked at the history of bushfires and I think that it was good because I hadn't really experienced any bushfires, anything major in my area, so it was good to know that, yeah, it *can* happen in my area."

-Year 7 student, Dandenong Ranges

Teachers agreed that this activity had been a highly effective means by which to increase students' awareness of their own potential exposure to a hazard event. It was the place-based, personalised nature of the activity that teachers identified as being most valuable:

"There was a heap of kids who said, 'If I lived there now, the fire would have come right through where I live.' I think it really hit home because that before that [it was] 'Oh yeah, it could happen, it could happen.' But I think that's the point where they went, 'It *could* happen and it *has* happened and it could very well happen again'... So, I found that was the real sort of point at which they went, 'Oh, this is us!'"

-Teacher, Dandenong ranges

"They loved that. Yeah, because they're all vein, it's all about *them*. They're all looking at where they lived and it's funny because I live near a lot of the kids and there's a tiny little creek and it's got a running track around it and we're saying, you know, 'Where could there be floods?' And they're like, 'Oh, nowhere near us.' And I said, 'Zoom in everywhere that floods.' And so, then they pointed out that this creek *could* flood.' So, then it becomes interesting. And also, to see the bushfires, where the bushfires had been in the past hundred years. And oh, you know, they could see that one had been, you know, just up their hill. So, they liked that. That was good."

-Teacher, Ballarat

Importantly, students also noted that their increased awareness of their own potential hazard exposure had led to an increased recognition of the need to plan and prepare for local hazards.

"Well, it kind of made me think that we might need a fire plan."

-Year 7 student, Dandenong Ranges

"After seeing the fires near you had happened, you could then make a fire plan, like you could go home to your family and tell them about it and stuff."

-Year 7 student, Dandenong Ranges

"Well, we found out who actually needs to take action if a flood happens because whoever is closest is most likely to get flooded. It showed us that. So, we know *who* has to take the most action. But still, everyone has to."

-Year 8 student, Ballarat



"I think identifying incidents that have occurred recently in the past, that helps [you] to, you know, plan for the future."

-Year 8 student, Ballarat

Teachers also noted how this activity had elicited valuable discussions and conversations about current levels of planning and preparedness in students' households.

"I had a few kids who went, 'But we were *already* doing some things' and that sort of started that discussion. And some said 'Oh, we're not really doing anything but I can start thinking about what I would do.'" And it sort of moved it from being about somebody else to being about *them* and starting to think what *they* can do and what their families are doing or *could* do."

-Teacher, Dandenong Ranges

While students enjoyed this activity, and viewed it as having a significant impact on their awareness of local hazards, some of them felt that the discussion questions could be improved. In this lesson, the follow up questions for the bushfire mapping activity had included: 1) What do the red areas mean? 2) Has there been a bushfire in your in the past 50 years? How close did it come to your house or school? and 3) Could there be a bushfire in your area in the future? However, students felt these questions needed to be more challenging:

"It says 'Could there be a bushfire in the area in the future' - obviously there can so that's kind of a useless question."

-Year 7 student, Dandenong Ranges

"What do the red areas mean? That's obvious because that's where the bushfires are."

-Year 7 student, Dandenong Ranges

Students suggested that a more challenging task might involve recording the year of the fire, estimating its spatial extent and approximating its distance from their house or school. A possible extension activity could then involve searching online for information about the fire or asking older relatives, neighbours or friends if they have any knowledge of the event.

One of the teachers also suggested that the discussion questions in the extension activity should be made a part of the core lesson. Those questions had included: 1) How did this activity change your understanding of local hazards? and 2) Could other parts of your community be flooded? They viewed these questions as providing an important opportunity for students to reflect on their learning and explore the personal implications of that learning.

Some students also reported that the Map/Filter didn't recognise their address, which they found they frustrating and disappointing. It may be necessary to provide students with some solutions to this problem should it arise. One solution might be for students to zoom in on the map and use other streets or landmarks to approximate the location of their house. Another solution might be to type in the address of another street in the general vicinity of their own property and then approximate the location of their house from that point.



It is also worth noting that some students in Ballarat, whose properties were in close proximity to the 2015 Scotsburn bushfire, could not find this fire on the map.

"It told you where the fires and floods would be but it wasn't really as up to date. It had this fire that went *around* our house on it that would have burnt through all our property, but it said like 1960 or 1980 or something... But the fire came near us and it was only a few years back because I remember it. That was the fire that happened like when my parents were kids."

-Year 8 student, Ballarat

That fire is now appearing on the map, but it may be worth adding a note to the lesson materials that explains to students there may be some delay in adding recent fires to the map.

Key recommendations for Activity 3: Your local hazards

- Develop more challenging discussion questions related to the year in which the fire occurred, and its spatial extent, and its proximity to the student's home or school.
- Make the class discussion in the extension activity a core part of the lesson.
- Consider including an extension activity in which students search online for information about past fires or ask older relatives or friends if they have any information about past hazard events in the local area.
- Provide guidance and advice for students whose address isn't recognised by the Map/Filter function.
- Advise students that there may be some delay in adding recent fires to the map.

Lesson 3: Disaster vulnerability

The aim of this lesson was for students to understand that a hazard event does not inevitably result in disaster and that a disaster only occurs when a hazard event impacts on a vulnerable community. The lesson first introduced students the concept of disaster vulnerability and then explored the different factors that can make people vulnerable to hazard impacts. The lesson was comprised of a single learning activity designed to achieve three specific learning intentions:

- Identify what makes someone vulnerable to the impacts of a hazard.
- Explain how a natural hazard becomes a disaster.

Activity 1: Disaster vulnerability case studies

In this activity students were provided with case studies of two major Australian disasters: the Black Saturday bushfires of 2009 and the Grantham floods of 2011. Each case study presented survivors' reflections on the various factors that had made them and their communities vulnerable to the impacts of those events. Students were asked to read the case study, list the impacts of the event, and



identify the various factors that had increased individual and community vulnerable to those impacts.

Students widely agreed that this activity was an effective means by which to explore the concept of disaster vulnerability and they could readily articulate the factors that had increased human vulnerability on Black Saturday, including a lack of hazard knowledge and awareness, low levels of emergency planning and preparedness, the failure of early warning systems, and inadequate resources for emergency response.

“Some of them hid in the bathroom, which is probably the worst place because usually a bathroom often doesn't have a door or a window to get out of and stuff. But like they think that because there's water in there that they'll be safe but, no”.

-Year 7 student, Dandenong Ranges

“Like some people weren't prepared and didn't know there would be a bushfire then and they didn't get out on time.”

-Year 7 student, Dandenong Ranges

“I remember one town that a bushfire was at, they were so in denial that it was going to happen because they hadn't really had a major bushfire like that before...So they were really like, 'It's not going to happen, don't worry about it' and none of them had even prepared.”

-Year 7 student, Dandenong Ranges

“They left too late, so there would be lots of traffic and they left too late and the fire would come.”

-Year 7 student, Dandenong Ranges

“They weren't prepared because they didn't really actually get their plan ready where they would go. And if they did have it ready, they didn't have time to act because it was going too quick.”

-Year 8 student, Ballarat

When discussing the design of this activity, the students identified a range of strengths and weaknesses. In terms of strengths, they appreciated that the case study drew on the stories of survivors and felt that the use of direct quotes had made those stories interesting and believable.

“That was pretty cool. Some of them said that it was scary but then some of them, they said what they should have done more...How they should have prepared more like in the quote they said 'We didn't do this' or 'We didn't do that and that led to us having more risk of getting more injured or harmed.’”

-Year 7 student, Dandenong Ranges

“It was interesting to hear others' real-life experience.”

-Year 7 student, Dandenong Ranges



"The case study quotes were good...it showed that floods were dangerous and we had proof from people's quotes."

-Year 8 student, Ballarat

"It was very interesting to hear from people that it happened to and the damage it could cause."

-Year 8 student, Ballarat

"They were from actual people and if you know that they've actually seen what happened - their view, they've been through it - you've got more information linked to them, instead of just getting a news report of them coming in when it's not actual victims of the flood where their houses and everything has been destroyed because of it."

-Year 8 student, Ballarat

The consensus amongst students was that the activity had enabled them to gain insight into the actions or decisions that had placed people in dangerous situations. They also felt that it provided a valuable opportunity to learn from past mistakes.

"It was good because they just told you that they would do better if they could do it again, like instead of staying and trying to defend the property. Yeah, I liked that. Learn from their mistakes."

-Year 7 student, Dandenong Ranges

"That was a good idea because if they didn't know, if the kid didn't know, they'd go just fill the bath up and 'Let's hide under the water', but now they know that they shouldn't do that. It's good to know what you shouldn't do *and* what you should do."

-Year 7 student, Dandenong Ranges

"I liked hearing about other people's experiences because it kind of informed us for if we were in that position."

-Year 7 student, Dandenong Ranges

The students also explained how the activity had given them cause to reflect on their own conditions of vulnerability and, more importantly, the steps they could take to reduce it:

"It's good because it's like the awareness bit of it. It's like telling you to plan stuff."

-Year 7 student, Dandenong Ranges

"You don't assume [that] you're going to be safe anymore."

-Year 8 student, Ballarat

"It probably made people think, 'Oh maybe we should have a plan so this doesn't happen to us if that did happen'. So that was good."

-Year 8 student, Ballarat

While the students approved of the case study content, they did voice concerns about the *amount* of content. Many students felt that the case studies were too long and that the amount of content was overwhelming.



"It was maybe too long and maybe they could have made it a bit shorter. It kind of just went on and there was lots of pages and it was kind of overwhelming."

-Year 7 student, Dandenong Ranges

"It was good content. Just a bit too much of it."

-Year 7 student, Dandenong Ranges

"They're both 6 pages long. You get like half an hour to read the entire thing. It gets pretty boring if you have to read 6 pages of something."

-Year 7 student, Dandenong Ranges

Teachers agreed that the case studies were too long and recommended that they either be shortened or broken up into smaller, more manageable components.

"I think there's a lot of information there for kids, especially Year 7's. And especially probably the weaker readers, I think they're probably a little bit bombarded. I'd probably structure a little bit more in terms of which parts of this I use and which ones we would read through. But it's good to have lots here to be able to make those choices. I think some of the quotes are fantastic. But especially for the weaker readers in the class, I think they were a little bit overwhelmed with how much information was there. But you don't have to use it all."

-Teacher, Dandenong Ranges

As with the Wye River case study, students also raised concerns about the text format, suggesting that this may not be the most engaging way to communicate such important information.

"I find a lot of people, when they read, they don't keep information in their head."

-Year 7 student, Dandenong Ranges

"They don't absorb it, unless they're big readers. Unless you're a person that really enjoys reading."

-Year 7 student, Dandenong Ranges

"I didn't like all the reading in the case study."

-Year 8 student, Ballarat

Many students strongly recommended that the case studies be presented in an audio-visual format. Some students suggested that video would be the best option, while others suggested that audio or imagery with accompanying audio or text would also work well.

"Maybe like some audio because it got quite boring just reading."

-Year 7 student, Dandenong Ranges



"I was going to say maybe a video makes people more inclined to like get into it - you are like 'Look at the pictures and look what happened'. I found people [were] more interested when there were videos."

-Year 7 student, Dandenong Ranges

"Videos... yeah, that would be a good idea and I think it would reach out more to young kids."

-Year 7 student, Dandenong Ranges

"I reckon photos and maybe underneath explain it. That would be good because then you can like remember that information with the photo."

-Year 8 student, Ballarat

"I reckon you need visuals because people get disengaged."

-Year 8 student, Ballarat

Teachers agreed that the case studies would be more accessible to students if they were presented in an audio-visual format. However, there were some students who said they preferred a text format, which suggests there may be value in presenting the case studies in a range of formats to accommodate individual student preferences.

"Sometimes it's best to put it down in words because then you can look back on it for more information because you can't really show that in a video that much, but in words it means a lot."

-Year 7 student, Dandenong Ranges

"I prefer it in writing because you can read the quotes instead of having it read to you."

-Year 7 student, Dandenong Ranges

Students asserted it was important to accommodate these differing preferences and suggested that presenting the case studies in an audio-visual format with an accompanying audio transcript would provide a viable solution. Students also suggested that the provision of an audio transcript would make it possible to review factual content quickly and easily.

Students also felt that the activity could be more interactive and student-centred. The lesson did include an extension activity involving a teacher-led reflective discussion about conditions of vulnerability in students' own households and communities: however, the students suggested that the opportunity to apply their knowledge of vulnerability to their own context should be made a core part of the lesson. They also suggested that a teacher-led discussion was not the most interesting or engaging way for students apply the concept of vulnerability to their own context and asserted that a more interactive approach was needed. Some students identified scenario-based activities as a potential option.

"Maybe like ask what you could do in that situation and maybe like give feedback."

-Year 7 student, Dandenong Ranges



"You could put us on the spot and be like, 'What would you do in this situation?' Then have us like act it out or something."

-Year 8 student, Ballarat

Another possible option might be to develop a short survey or quiz designed to assess key gaps in knowledge and preparedness that could be making students and their households vulnerable to hazard impacts. Students could then collate their responses, identify the most common gaps, and propose reasons for why those gaps might exist. This would have the added benefit of encouraging students to think about the root causes of vulnerability in their own lives.

A further weakness identified by the students was that the case studies were focussed solely on the perspectives and experiences of adults. While students appreciated the opportunity to hear the stories of adult survivors, they felt that the inclusion of quotes from children and young people would make the case studies more relevant and relatable for their age group.

"I would love to see a kid's point of view to it. That would be really good. I would like that."

-Year 7 student, Dandenong Ranges

"We're seeing mainly older people and it would be good to see some younger people's view of it... and like what they were thinking because older people are more, I guess, calm. They know more what to do. Whereas younger people are more...they don't know what to do."

-Year 8 student, Ballarat

"If they are young people's experiences, then you can relate to them because you know where their headspace is at the time."

-Year 8 student, Ballarat

"That would make us more aware of what could happen to you not just like older adults, what happens to children as well. How they react."

-Year 8 student, Ballarat

Finally, students asserted that rather than causing them to feel worried or afraid, the case studies had provided them with increased sense of safety because they now had a clearer understanding of the conditions that can increase vulnerability to hazard impacts. However, they did acknowledge that students who have experienced a major hazard event or disaster may find the content upsetting and those students should be given the choice to opt out of this lesson.

"Some people are going to be more affected by this topic because some people could have had family members who have died in bushfires or tsunamis or whatever. So, it's going to be more affected to them. So, not the whole thing should be optional, but certain bits, like this. Because I know a few kids from my primary school, they were affected, they were there."

-Year 7 student, Dandenong Ranges

"Let them be in on the preparation of the fire and the safety, but then if they're talking about different examples on fires then they can sit out on that and then they can come



back in when they feel ready for the task... Yeah you need to say first we're going to be talking about how to be safe in a fire, but then after that since we're going to be talking about examples so you can leave and maybe do something else and then if you want to listen to music so you don't have to hear it because that can also trigger it."

-Year 7 student, Dandenong Ranges

Interestingly, one of the teachers spoke of one student in her class who had experienced the Toowoomba floods in 2011. This student had appreciated the opportunity to participate in the lesson and share his experience of that event with his classmates:

"I actually had a boy in my class who lived in Toowoomba. So, he put it into perspective and talked about it quite a bit...He talked to me about it first and I then said to him, "Do you want to share anything?" Actually, he really *did* want to share because he's come from outside the area and he probably hasn't experienced a bushfire thing, whereas he could really talk about this."

-Teacher, Dandenong Ranges

Thus, managing the specific needs of students who may have been affected by a hazard or disaster is probably best left in the hands of individual teachers and students to address on a case-by-case basis. The introductory section of the teachers' guide already advises teachers that that *'if they know a student in their class experienced a traumatic event in the past, they should follow necessary procedures to ensure that the welfare of this student is carefully considered'*. The feedback from teachers was that this advice is adequate and appropriate and can remain its current form.

Key recommendations for Activity 1: Disaster vulnerability

- Reduce the length of the case studies and focus the content on the key factors that increase vulnerability.
- Present the case studies in an audio-visual format with an accompanying audio transcript with photographs.
- Include a core activity that encourages students to identify key gaps in knowledge and preparedness that could be making them or their households more vulnerable to hazard impacts.

Lesson 4: Becoming disaster resilient

The aim of this lesson was for students explore the concept of 'capacity' and identify the various ways in which people can use their knowledge, skills and resources to reduce disaster risk and increase resilience. A major theme of the lesson was that children and young people can make a valuable contribution to disaster resilience in their households and communities. The lesson had two main learning intentions:



- Understand our capacity to use resources and skills to reduce hazard impacts and increase resilience.
- Locate information online about what people can do to reduce the impacts of hazards.

Activity 1: Animation

In this activity, students watched a short animation on the topic of building capacity for disaster resilience. The animated video, which was developed specifically for the DRP, describes the various actions people can take to increase their capacity for protecting life and property from the impacts of a hazard event. The students were asked to watch the video and list as many actions as they could.

Teachers reported that this activity had run smoothly and there were no suggestions for improvement.

“We watched that twice so they could watch it and then watch it again and pick out all the other bits and pieces. Yep, that one was good.”

-Teacher, Ballarat

Student feedback for this activity was also positive. Students enjoyed watching the video and felt that it communicated important information in an engaging and accessible way:

“This video was good and I thought it was good that we had to list them down so we knew what to do to protect ourselves from a hazard or a fire.”

-Year 7 student, Dandenong Ranges

“It gave us extra things that we can do. It told us to make sure you have the websites and to help other people and who can help a lot and it said about younger people, so even though we are younger we can help a lot.”

-Year 7 student, Dandenong Ranges

“That animation was pretty cool, like seeing all of it being put together and all of that stuff coming into the video.”

-Year 8 student, Ballarat

Students also particularly enjoyed the animated format, which they found to be a highly effective means for communicating key concepts and ideas to their age group.

“It’s pretty good and suitable for kids our age because I guess kids our age will listen to animation. And younger kids will as well.”

-Year 7 student, Dandenong Ranges

“It was more creative and like grasped your attention.”

-Year 8 student, Ballarat



"I think serious videos are better for adults but animated videos are better for kids because...It's just more intriguing."

-Year 8 student, Ballarat

The animated video ran for just under 2 minutes and students appreciated the clear, straightforward presentation of information. They reported that the language was accessible and that the concise summary of key concepts and activities had made it easy for them to remember the main points.

"We watched it like five times...We got all the information from it, we soaked it in...That's what I mean, people are more engaged when there are videos."

-Year 7 student, Dandenong Ranges

"It's easier to get the information out of [the animation] because they're like short and sweet. They give you everything you need because some videos just go on and on and on and you're just like, 'Ugh'...Go straight to the point."

-Year 8 student, Ballarat

"There wasn't like a lot of information, which was good because then it wasn't all built up and we remembered it. When there's an animation it's easy to remember."

-Year 8 student, Ballarat

While the lesson plan for this activity did not include a class discussion, one student reported that his class *did* have a class discussion and that this had been a valuable addition. It may be worthwhile including a discussion-based activity in which students can talk about the various activities on their lists and explore some of the key points raised.

"I think it was cool there was an animation. It was like a bit different. Also like we kind of had a big discussion that informed us a lot, like a big class discussion so that helped. We talked about the different things you can do to protect yourself, like leaving, when you should leave. If there is like a fire or something, how you can identify them and all that."

-Year 7 student, Dandenong Ranges

The students did not identify any specific weaknesses in this activity. However, they did suggest that that an animated video should be developed for every lesson. They felt that presenting a short animation at the beginning of each lesson would provide students with a valuable overview of key concepts and ideas and increase their engagement in the subsequent learning activities.

S1: It would get us more engaged and be like "Right so the video today would be this", and you're watching it so now you're engaged with the video and we're aware of what we're doing in this lesson.

S2: And then talk about the worksheet.

S3: A lot of people like animations.

S1: Yeah even if it's for a minute or two it still will make people think.

S3: They'll remember it.

-Year 7 student, Dandenong Ranges



However, students also asserted that the animations should not replace the documentary style videos, which clearly depict the reality of hazard events and the experiences of real people.

"I think we need a mix of the two. Because the real life examples show you what it's actually like and when the cartoons capture people's eye more because they're more colourful most of the time."

-Year 7 student, Dandenong Ranges

"Documentaries are better because like you can like picture it actually happening to you and if you did, you know what to do in that situation...The other ones were real life situations of what people had done."

-Year 8 student, Ballarat

"Animation was not as good as other videos because it wasn't a real-life situation. Showing videos that depict real life is better."

-Year 8 student, Ballarat

Key recommendations for Activity 1: Animation

- Include a discussion-based activity in which students can share the various activities on their lists and explore some of the key points raised in the animation.
- For each lesson in the program, develop a short animation that provides a concise summary of the key concepts and issues that will be explored in the lesson.

Activity 2: Finding information

In this activity, working in pairs, students navigated the 'Plan and Prepare' section of the Vic Emergency website (www.emergency.gov.au/prepare) to answer a series of inquiry-based questions about preparing for and responding to bushfire, flood or storm. Students viewed this as a worthwhile activity. While a small number of students had been aware of the Vic Emergency website prior to the program, the majority had not come across it before and they viewed this activity as a valuable opportunity to become acquainted with the range of information and advice contained therein.

Teachers identified the inquiry-based approach to this activity as a major strength because it aligned well with their own pedagogical preferences and practices.

"That [activity] is good. Rather than us telling them and that whole 'write stuff on the board', if they're going and having to investigate themselves and find things, then that's great. That's how I operate a lot. Rather than giving things to them, I tell them to go and find out. So, that works perfectly."

-Teacher, Ballarat



Students also identified the group work aspect of this activity as a key strength.

“Well, I just liked it because you had to list things down and you got to like, with your partner you just got to talk about it and share your ideas. I feel like working with partners helps because you get to share your ideas.”

-Year 7 student, Dandenong Ranges

S1: In a group or anything or a class discussion even they help because you just talk about it and you can kind of say what...

S2: Even if it's a group of 2 or 3 you can kind of share each other's ideas and all that.

S3: You can kind of combine them and then, you know, put in.

-Year 7 students, Dandenong Ranges

While most of the students completed this activity in pairs, one teacher opted to implement it as an independent learning task. She pointed out that the program includes a lot of pair and group activities and explained that it is important for students to do some of the work of their own. However, she also suggested that having students complete an activity in pairs or on their own should be a decision that is left to individual teachers.

“A lot of this was group work. I know in this activity it's in pairs, but sometimes it's better for someone to just go and do it themselves. If they want to help each other, they'll do that, but that's still a choice of the teacher. That task, I didn't get them to do it in pairs. I said, 'No, do this one on your own', because it's really a one-person task anyway.”

-Teacher, Ballarat

Accordingly, it may be appropriate to remove the instructions about pair work from the student version of the website and advise teachers that they can make their own decision as to whether students complete this task independently or in pairs.

While students didn't have any specific issues with the inquiry-based nature of this activity, they did have suggestions regarding what kind of information it would be most interesting and relevant for students to search for on the website. They proposed that questions on the following topics should be prioritised:

- Early warnings and alerts
 - The fire danger rating scale: “There's the colourful thing, the wheel thing, like that thing and it tells you if it's a code red or something and sometimes it's over the radio or on TV.”
 - Emergency alerts: “Alerts on your phone and like over the radio and stuff... Like signs so you can know.”
 - The Vic Emergency app: “Explaining like what the app does and how to use it.”
- Emergency planning and response
 - Triggers to leave and leaving early: “*Information about when to leave and stuff.*”
 - Emergency kits: “*What you need to bring if you do leave.*”



- Caring for animals: *“How to help if you have pets. Like, in an emergency situation. Like, what do you do?”*
 - Safe evacuation routes: *“Where to go and which direction to go in.”*
 - What to do if you can't leave: *“What to do if it's a one-way road - how do you get out...Do you cover yourself in water? Yeah like do you get in the bath, like if you're trapped?”*
 - The dangers of driving or recreating in flood water: *“How you never know what's in the water, you can be taken away by the currents... you should not be playing in the water”*
- Preparing your property
 - Simple but effective actions people can take to reduce the impacts of a hazard on their property: *“When it's coming into fire season they should clean up around their house because just doing a few small things like that can actually decrease the risk of bushfire.”*

The Vic Emergency website does provide information on most of these topics and hence, it would be possible to redevelop the inquiry questions to address students' primary interests and concerns. While the current questions do address some of these topics, they could certainly be refined to reflect this student feedback.

It is worth noting the bushfire component of this activity involved completing a 'Fire Ready Quiz' on the CFA website and students reported high levels of enjoyment and engagement with this task.

S1: It was interesting and like you get know how fire ready you are and you know what you need to improve on.

S2: It was fun!

-Year 7 student, Dandenong Ranges

S1: I actually really liked it because the questions were about what we've learnt so it's kind of like just testing us about what we've just learnt and our knowledge on it. And I really liked it. I liked how it had the different examples and all that.

S2: Yeah this one was like, it wasn't like it was a hard quiz but it was just like it was I guess fun but...

S1: Yeah it had a lot of, I guess, informational questions.

S3: Yeah it was targeted, so it wasn't that boring.

-Year 7 student, Dandenong Ranges

It is recommended that this activity concludes with a quiz that students can use to test their knowledge. The quiz questions could be specifically tailored to cover the key topics that students investigate as part of the 'Finding Information' activity and students could receive feedback on their answers to help address any key misconceptions or knowledge gaps.

Key recommendations for Activity 2: Finding information

- Revise the instructions to teachers and students so that teachers can make their own decisions as to whether students complete the activity independently or in pairs.
- Revise the questions to directly address students' interests and concerns as they relate to early warnings and alerts, emergency preparedness and response, and preparing your property.
- Include a quiz that students can use to test their knowledge at the end of the activity.

Lesson 5: Taking action

The aim of this lesson was to provide students with an opportunity to translate their knowledge into action. The lesson included two learning activities designed to achieve three specific learning intentions:

- Identify achievable disaster resilience activities that could be undertaken at home or school.
- Formulate a plan for the successful completion of an action or activity that would increase disaster resilience at home or at school.
- Identify potential obstacles to taking action and formulate strategies for overcoming those obstacles.

Activity 1: Case study of Tilly Smith

In this activity, students watched a short video about Tilly Smith and her role in the emergency response to 2004 Boxing Day tsunami. Students were then asked a series of questions about the video and the actions Tilly took to protect over 100 people from the impacts of the event. The students in this study were enthralled by Tilly's story. None of them had heard this story before participating in the DRP and they had been surprised to learn that a young person could exert such a powerful influence on the safety of others.

"I've heard stories like that but not as good, like not as amazing as that. I've heard of people saving like five lives or something, but one hundred is a lot!"

-Year 7 student, Dandenong Ranges

"I was a bit surprised like she was able to save hundreds of lives...Just from learning from her teacher about how tsunamis work."

-Year 7 student, Dandenong Ranges

Students indicated that Tilly's story was a highly effective means by which to challenge the assumption that adults always know how to recognise or respond to a hazard event and that children are passive subjects whose safety is entirely dependent on the decisions and actions of adults.



S1: I feel like some adults think that because we're children we don't really know as much as adults do.

S2: Yeah, they don't believe us.

S3: Yeah, because we're children.

S2: But adults can't always be right.

-Year 7 student, Dandenong Ranges

"She informed everyone...Even though we're kids we can still help out a lot. Like knowing stuff would help a lot of people."

-Year 7 student, Dandenong Ranges

"It's good to see young kids doing it because it shows that like we could do it. We could help people."

- Year 7 student, Dandenong Ranges

S1: It shows that we can do it, what adults do.

S2: Like that we can help and do something about it.

-Year 8 student, Ballarat

S1: It was really good because she was a younger girl who knew the signs of tsunami warnings.

S2: It kind of showed that her mum didn't know that a tsunami was coming, so it shows that sometimes the adults don't always know that.

-Year 8 student, Ballarat

Some students also explained how Tilly's story had demonstrated the importance of disaster resilience education for children and young people and imbued their learning with meaning and purpose.

S1: It's trying to encourage you and what you can do with the knowledge and to be a leader and stuff.

S2: So you know that you're learning this stuff for a reason. Like there is a point to it.

-Year 8 student, Ballarat

Teachers agreed that the Tilly Smith video had made a strong impression on the students. One teacher also explained how it had given her an increased sense of purpose with regards to disaster resilience education.

"One of the things that we got out of that too was how awesome that teacher was. And because I said, 'Before the Thailand tsunami, I don't even know if people knew what a tsunami was'...So we talked about how that's amazing that the teacher also actually taught that much content!"

-Teacher, Ballarat

Given the positive impact of Tilly's story on both students and teachers, it is recommended that this activity is moved to Lesson 1.

While students found this activity highly engaging and thought provoking, they did suggest that the activity could be further enhanced by including case studies that focus on the actions that Australian children and young people have taken



to increase disaster resilience in their households, schools or communities.

“Because we’re talking about disasters and bushfire resilience but then there’s a video about a tsunami. But we’re not really going to get a tsunami here, so it would be better to have someone in Australia talking about a flood or bushfire, something that would happen more often here.”

- Year 7 student, Dandenong Ranges

While Australian case studies of this nature might be scarce, there are several good examples in the book ‘From Kinglake to Kabul’ (Grant & Williams, 2011). The Australian Red Cross has also produced videos in which young people are interviewed about their roles in disaster preparedness, response and recovery as part of the ‘After the Emergency’ project and the videos are readily available on the Red Cross website (Red Cross, 2018). However, any additional case studies should be selected on the basis that they clearly exemplify the contribution young people can make to disaster resilience when they have the opportunity to develop their knowledge, skills and confidence.

Key recommendations for Activity 1: Case study of Tilly Smith

- To provide students with a sense of purpose from the beginning of the program, move the case study of Tilly Smith to Lesson 1.
- Consider the inclusion of additional case studies of actions Australian children and young people who have taken to increase disaster resilience in their own local context.

Activity 2: Making an action plan

In this activity, students were asked to choose a local hazard that could affect them (i.e., bushfire, flood or storm) and decide on an achievable action or activity they could undertake to reduce the impacts of that hazard. They were then asked to answer the following six questions about their chosen action or activity: 1) What action are you going to take? 2) How will this increase your resilience? 3) What resources will you need? 4) Who else should be involved? 5) What obstacles or challenges might you face? and 6) How might you overcome these obstacles or challenges?

Students provided positive feedback on the action-oriented nature of this activity. They felt that it was a good way to bring together what they had learned in the previous lessons and provided an opportunity for them to exercise their own agency.

“Yeah it was a pretty good. It was a good conclusion because it kind of sums up what we talked about the whole time and you put it into your own words and stuff.”

- Year 7 student, Dandenong Ranges



“That one was good. Because you could write down what you need and what you could get ready.”

- Year 7 student, Dandenong Ranges

“It makes you bring together all the stuff that you've learned.”

- Year 7 student, Dandenong Ranges

“It gets us more involved...It doesn't just make us feel like we don't know anything and we can't do anything about it.”

-Year 8 student, Ballarat

“We're involved. So, you know that you can do something, like have a plan and know what to do.”

-Year 8 student, Ballarat

However, many of the students suggested that the activity was too broad and unstructured. While the activity had been designed to provide students with a high degree of autonomy so they could select actions or activities that were appropriate for their own context, the students suggested there should be more specific guidance on the actions they should take.

“Be a little more specific with the action plan. We need easier and more simple ways to understand what to do in disasters.”

-Year 8 student, Ballarat

“I think it needs to be a bit more simple, because I didn't really get *what* to do if there was a bushfire.”

-Year 8 student, Ballarat

Teachers agreed that while some students were able to manage the relatively unstructured nature of the activity, many others struggled with it.

“The kids that handle self-paced learning just went out and did it and came up with all sorts of extra stuff and got a great lot of detail – so they probably got more out of it.”

-Teacher, Dandenong Ranges

The consensus amongst both students and teachers was that this activity should focus specifically on household emergency plans. Indeed, in the absence of explicit guidance, a large proportion of the students chose to focus on the development of a household emergency plan, which they viewed as one of the most important things they could do to increase disaster resilience.

“I think it's a good idea - now we've learned about it, now we can try to make a plan and I reckon that's pretty good - an emergency plan.”

- Year 7 student, Dandenong Ranges



- S1: Make a plan [of] where you're going to make sure you are safe.
 S2: Make sure everyone in the family actually knows your plan.
 S3: Because I know like heaps of families and your two kids might know it and there's two more kids that are like, "I don't know what to do!"
 S4: You've got to make sure everyone knows.

-Year 8 students, Ballarat

- S1: If you live in this area, you need to make sure you know what to do...
 S2: Have an emergency plan!
 S1: So, if you have animals and stuff, to be able to get them out of the area or something like that.
 S3: And even like putting it - if you have an emergency plan - put it on the inside of your wardrobe.
 S4: Pantry door because everyone's in the pantry. Like places where...
 S1: Back of the toilet door.
 S3: Somewhere where everyone looks.

-Year 8 students, Ballarat

Many students reported that their family did not have a household emergency plan prior to the program. Some students reported that while their family may have had an emergency plan prior to the program, they had not been familiar with the plan or had not been involved in the planning process. However, due to the program, they had initiated important discussions with their parents and other family members.

"From my perspective I'd never actually talked to my family about it until I did this. Obviously, your parents tell you not to leave the stove on or whatever but we'd never talked about leaving or whatever if it happened. We're on a hill so we're protected from some things and not others. So, we kind of talked about it and it was just like get in the car and go and don't take anything you don't need."

- Year 7 student, Dandenong Ranges

"We talked about what's your plan and stuff. I thought most people would [have one]. Someone asked in the classroom, 'Who has one?'. And like *noone* did! And there's a few people that live like out in the bush as well, and *they* don't even have a plan! So, they might now."

-Year 8 student, Ballarat

Another student noted that while his family already had a bushfire plan prior to the program, the knowledge and information he had gained through the program, would enable them to update their plan.

"I guess for me, I already had a plan [for] my family, so you know having all this information we could update our plan."

- Year 7 student, Dandenong Ranges

Taken together, this feedback from students and teachers provides strong support for redeveloping this activity to focus specifically on household emergency plans. Not only did the students view the development of household



emergency plans as a priority action for building resilience, they also viewed it as relatively achievable.

Based on their own experiences of developing emergency plans as part of this activity, students and teachers provided several suggestions that could be incorporated into the design of a household planning activity. For example, students felt that it was very important to involve parents and other family members and the activity should be designed to support and facilitate this involvement.

S2: I feel like that's another thing was missing in the activities because a lot of kids like do it at school and then they don't go home and they don't talk about it with their families.

S3: Putting action to it.

S1: It's like making activities that you have to go home and actually talk to your parents with and then come back to school.

S3: And questions like 'Are you prepared?', 'What would you do?'

S1: 'What is your plan?' And then the kids might go home and talk to their parents about, 'What's our plan?' And then come in a share it with their class.

-Year 8 students, Ballarat

Teachers agreed that incorporating a home-based component into the activity would have significant value:

"You could make that part of it that, 'Go home and show your parents or show your carer to see if they can add anything to it.' Or, you know, 'You could ask them to contribute something to your plan.' Just so then you know that the parents have seen it."

-Teacher, Ballarat

I think the discussion is fantastic. And a lot of kids said, 'Yeah, you know, I've been going home...' And that was a really good part of the unit because I think a lot of Year 7 parents feel a little bit removed from what they're doing and this was something they could actually be involved in. And I think that was a real positive.

- Teacher, Dandenong Ranges

However, teachers did emphasised that any kind of home-based activity of this nature would require a realistic timeframe that accommodated the busy schedules of local families:

"I was more worried about the time factor. Parents here are busy and they might be busy at that particular time and not want to do it then and there. They should and it's good to talk about it but I was worried about sending it home and saying to families, saying to kids, 'You have to this with your family and bring it back within this time.'...Having it so they had to do it by 'that time', I was a bit hesitant...But I think it is good if they go home and discuss it and that was a real positive that most of them did go home and discuss things with their families."

-Teacher, Dandenong Ranges

Students also suggested that including example plans and planning templates on the program website would facilitate the successful completion of a household emergency planning activity.



S1: What would be really cool is maybe having like a plan that you can fill out like in the website. Maybe a plan that you could fill out or something.

S2: Yeah, template.

S3: Have an example of a plan.

-Year 8 students, Ballarat

"Having a template on the website and you print it out and bring it home. And then that night the family could sit down and create a plan in detail."

-Year 8 students, Ballarat

Teachers agreed that the provision of planning templates would be a valuable addition to any emergency planning activity.

"I think they need something like a template where they can go and fill in the gaps and, you know, and that interactive sort of thing. And print it or save it and take it with them. Pin it up at home or something, you know?"

-Teacher, Dandenong Ranges

Students could also use templates or example plans to construct their own template that is tailored specifically to their own household context. This would provide students with an opportunity to think critically and creatively about the specific issues that their household would need to address as part of the planning process. This may also provide students with an increased sense of ownership when they go home to complete the plan with their family. One of the teachers explained that she had her students design a poster to present their action plan and found this to be a more engaging and interesting alternative to the straight question and answer format in the lesson plan.

"I got my students to all create their own action plan poster at the end and send it to me. Like choose a disaster that could happen at their house and then do it as a poster so that they could perhaps put it on their fridge at home or something. So rather than just get them to do those questions, I got them to put it into a like a poster like an A4... I said, 'It's like, you know, if you see action plans and emergency things, like a flyer on someone's fridge. That's what you've got to create for home sort of thing.' And so, it just makes it a little more interesting than just straight question, answer type thing."

-Teacher, Ballarat

Key recommendations for Activity 2: Making an action plan

- Redevelop the activity to focus specifically on the development of a household emergency plan.
- Design the activity to support and facilitate the direct involvement of children's households.
- Provide students with example plans and planning templates, but encourage students to design a template that is tailored specifically to their own household context.
- Advise teachers to adopt flexible timeframes for any home-based activities so that households can allocate adequate time for their completion.



FEASIBILITY AND ACCEPTABILITY OF THE IMPLEMENTATION STRATEGY

Professional development session for teachers

The implementation strategy for the pilot version of the DRP involved a 45-60 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. For the teachers in this study, this professional development session was viewed as being fundamental to program uptake and effective delivery in schools. The practical step-by-step guide to program delivery was highly valued by teachers, who had not had any previous exposure to the DRP program or DRE more generally.

'It was good, very helpful, because it was something that all the teachers had probably never ever seen before and because he went through each lesson step by step.'

-Teacher, Ballarat

'I think it's really important to have that one on one [professional development]. Someone to come and really talk to the staff about how it works and logging in and the purpose and all those things.'

-Teacher, Dandenong Ranges

'You have to get the practicalities worked out. You know, you're logging in and getting yourselves set up so that you can walk into your class and go, bang! And deliver it. So, there was that side of it.'

-Teacher, Dandenong Ranges

Teachers explained that their existing workload leaves them with very little time to familiarise themselves with new program materials and resources, which can be a major obstacle to the uptake of new programs or initiatives. However, they viewed the step-by-step guide to lesson delivery in the professional development session as a highly effective means by which to overcome that obstacle.

'A lot of us [are] time poor, [and] probably wouldn't of had our own time to go in and go look at all those resources, so the fact that he showed us, [and said] 'This is where you can find all these things and what you can do is this' and then when it came to do it, I might have just gone and scanned over it for a couple of minutes and gone, 'Yep, that's what I'm going to do. I remember that.' Yeah, so that was definitely worth it.'

-Teacher, Ballarat

Teachers also reported that the professional development session provided an important opportunity to ask questions of the project staff and resolve any issues or concerns prior to program delivery. They also highlighted that it provided a valuable opportunity to establish a relationship with an agency staff member who would be able to provide direct assistance with any issues or concerns during or after program delivery.

Teachers reported that because of the professional development session and the availability of ongoing agency support, they had been able to confidently deliver the program in their classrooms. In many ways, this speaks directly to the



importance of collaboration and partnership in the delivery of school-based DRE (Towers et al. 2016). Through a teacher-delivered model of implementation, emergency management agencies can increase the reach of their DRE programs: however, as indicated by the teachers in this study and the wider consultations that informed the development of the DRP, schools should not be expected to do this without direct assistance and support from the relevant emergency service agencies. The concept of shared responsibility which underpins the NSDR (COAG, 2011) presupposes the need for this kind of collaboration and partnership across all aspects of DRR and resilience, and DRE is no exception (c.f. McLennan & Handmer, 2012).

Importantly, the students in this study also endorsed the teacher-delivered model of implementation but they also highlighted the importance of shared responsibility between schools and the emergency management agencies.

"[Teacher delivery] is good. It can be the teacher because it's easy to access and you don't need to have someone who knows more about it than the teachers because the teachers know stuff about it, but the CFA people know more and the teachers are helping that because there's not enough [CFA] people to go around and so the teachers just need to have some information on how to access it."

-Year 7 student, Dandenong Ranges

Curriculum alignment

To support implementation in schools, the DRP was designed to directly align to learning stands and content descriptions for Years 7 and 8 Geography in the Victorian Curriculum (see Table 2). Teachers in this study reported that it provided a valuable learning tool through which to address those curriculum elements. In both schools, the program was delivered as part of the learning strands for *Geographical Knowledge and Understanding*: specifically, *Landforms and Landscapes*, *Place and Liveability* and *Water in the World*. However, teachers also highlighted its relevance to the learning strand for *Development of Resilience* in the subject area of *Personal and Social Capability*. As one teacher noted, it provided a valuable lens through which to explore the concept of personal resilience:

"It's so important for kids to be resilient and we talk about resilience but I don't think a lot of kids actually know what it means, whereas this gives something quite concrete that they can actually say, 'This is what a resilient person would do in this situation'...And it just puts it into that context and they need concrete things. It's a project that's worth it."

-Teacher, Dandenong Ranges

During the interviews, teachers repeatedly highlighted the importance of directly aligning the program to the Victorian Curriculum and clearly articulating the curriculum connections in all program materials. They emphasised that failing to make the curriculum connections clear to teachers would represent a threat to scaled implementation. Therefore, the curriculum connections should be emphasised on the website, in all promotional materials and in the professional development session.



Key recommendations for the DRP implementation strategy

- The professional development session should be retained as a key component of the implementation strategy.
- The connections to the Victorian Curriculum should be clearly articulated and emphasised on the program website, in all promotional materials and in the professional development sessions.



CONCLUSIONS

This study of the DRP, undertaken from the standpoint of students and teachers, has found that the program has a high level of feasibility and acceptability. Data collected in focus group discussions with students and in-depth interviews teachers indicate that the program was highly valued by both stakeholder groups. Students reported that the program provided them with important knowledge and information that could be applied to disaster risk reduction and resilience building activities in the context of their own lives. Meanwhile, teachers reported that the program provided students with valuable learning opportunities that were relevant, meaningful and directly aligned to the formal curriculum. Importantly, both students and teachers expressed strong support for the teacher-delivered model of implementation: however, teachers also emphasised that the effectiveness and sustainability of this model will be highly dependent on the provision of the face-to-face professional development session delivered by trained emergency management personnel.

By providing students and teachers with a platform to voice their perspectives on the structure, content and implementation of the DRP, the study also identified the need for numerous modifications and improvements that have the potential to increase student engagement and further enhance student learning outcomes and disaster resilience outcomes. Of particular importance is the need to include more content related to the roles and experiences of children and youth in disaster risk reduction and resilience. From the data collected, it is clear that students highly value content that is specifically related to their own demographic and which challenges the assumption that children and youth are passive subjects in the processes of disaster preparedness and response. It is also clear that while students value the opportunity to share their own perspectives on hazards, disasters and disaster resilience, they also appreciate access to credible, evidence-based information and structured activities that provide clear guidelines and advice on what they can do to effectively prepare for and respond to local hazard events.

The study has also demonstrated the fundamental importance of amplifying student and teacher voice in DRE program development. While the active involvement of students and teachers in decision-making regarding the structure, content and implementation of DRE programs has not been standard practice in Australia or internationally, the insights provided by the students and teachers in this study provide compelling evidence for including them as genuine stakeholders in the development process. The students in this study provided invaluable feedback on how the DRP can be improved to better meet the needs and priorities of young people and accommodate diverse learning styles, preferences and abilities. Whilst most of the student recommendations can be readily implemented, some of them will require additional work that is beyond the scope of the current pilot project. For example, the inclusion of additional content that speaks specifically to the experiences of Australian children and youth in disaster contexts is challenged by a distinct lack of research in this domain. In this sense, the study demonstrates how student voice in DRE can support the development of a more inclusive, needs-based research agenda.



While the study has provided valuable evidence for the feasibility and acceptability of the DRP, it is important to acknowledge a key methodological limitation. Although a large number of students participated in the focus group interviews, the representation of disabled students and students from culturally and linguistically diverse (CALD) backgrounds was observably low. To ensure that the DRP can adequately accommodate the diversity that exists in Victorian schools, it will be important to ensure that any future research or evaluation makes a concerted attempt to amplify the voices of these students. An increased focus on the needs and priorities of Aboriginal and Torres Strait Islander students should also be prioritised in future research and evaluation projects. Within the DRE literature, the views and perspectives of students from diverse backgrounds are very rarely considered and this represents a major impediment to the development of inclusive and respectful DRE.

Despite these limitations, it can be concluded that the DRP constitutes a viable mechanism for the scaled implementation of effective DRE in Victorian secondary schools. While existing disaster resilience policy frameworks and recent curriculum reforms provide unprecedented opportunities for the increased delivery of DRE in schools, the scaled implementation of effective programs has proven a significant challenge. With sufficient investment and commitment from the Victorian emergency management and education sectors, 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 at home, at school, and in the wider community. As part of any strategy for scaled implementation, consideration should be given to the development of a monitoring and evaluation framework that can provide partner agencies with valid and reliable evidence related to program activities, outcomes and impacts. Such an exercise will not only provide the basis for data-driven continuous improvement, it will also serve to demonstrate the value of investing in school-based DRE for disaster risk reduction and resilience.



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APPENDIX: DISASTER RESILIENCE PROJECT LESSON PLANS

DISASTER RESILIENCE

An educational resource for schools



Teacher Introduction

What is disaster resilience?

Disaster resilient individuals and communities understand their local hazards. They take action at home and in the community to reduce hazard impacts and prevent hazards from becoming disasters. They follow safety advice and warnings and respond safely during an emergency. After an emergency, they support each other to recover.

Hazards such as storms, floods and bushfires can have enormous social, economic and environmental impacts. With climate change, we are likely to see more frequent and intense hazard events. Building disaster resilient communities has never been more important.

What is disaster resilience education?

Disaster resilience education provides children and young people with the knowledge, skills and attitudes they need to help build resilience in their homes, schools and communities.

Children and young people are frequently overlooked when it comes to disaster resilience, but research shows that if they are provided with the necessary guidance and support, they can increase their own safety and the safety of others.

Children and young people are often highly motivated to learn about disaster resilience and they embrace opportunities to participate in resilience building activities. When we tap into this reservoir of enthusiasm the whole community benefits.

The “School Curriculum Natural Hazard Resilience Package” aims to teach students the fundamentals of disaster resilience and encourage their participation in the development of safer communities.

Who can teach disaster resilience?

You do not need to be a member of the emergency services to teach children and young people about disaster resilience. You have permission to do this. In fact, with your expertise in teaching and learning and your knowledge of the school community, you are uniquely placed to deliver disaster resilience education that meets the needs of your students.

This program offers a straightforward approach to teacher-delivered disaster resilience education. The content has been informed by the official advice of the Victorian emergency management agencies, as well as the international research on disaster resilience education. While the program has been designed to provide you and your students with all the resources you will need, should you require any further assistance or support, please contact the CFA project manager Matthew Henry by email at: m.henry@cfa.vic.gov.au

Will teaching my students about disaster resilience cause them fear or anxiety?

Learning about disaster resilience can actually reduce student fears. However, if you know of a student who has experienced a traumatic event in the past, you should follow necessary procedures to ensure that the welfare of this student is carefully considered.

Recommended resources



ABC TV's Catalyst story 'Don't Panic' provides insight into what happens to our thinking and decision-making during times of emergency and why planning and rehearsing is crucial.

<http://www.abc.net.au/catalyst/dontpanic.htm>



Vic Emergency is Victoria's new single source of warnings and advice for all hazards and emergencies. The site also contains valuable preparedness information.

<http://emergency.vic.gov.au/>



Australian Disaster Resilience Knowledge Hub provides statistics and information, photos, video and media about past disaster events.

<https://emknowledge.org.au>

Curriculum connections

Unit Learning Objectives

Students learn that while natural disasters such as floods, bushfires and storms are inevitable, we can reduce their impacts if we learn from past experiences to better prepare, prevent, respond and recover from natural disasters.

At the end of this unit, students should:

- ▶ Know what being disaster resilient means for individuals and communities
- ▶ Identify their local natural hazards
- ▶ Begin to understand key concepts of prevention, mitigation, preparedness, response and recovery
- ▶ Understand how preparation, planning and emergency drills can help us respond more safely in an emergency
- ▶ Know where to find information and advice to help them plan, prepare and respond to floods, storms and bushfires

Victorian Curriculum Connections

Levels 7 and 8/Personal and Social Capability/Development of resilience

Achievement Standard. They reflect on strategies to cope with difficult situations and are able to justify their choice of strategy demonstrating knowledge of resilience and adaptability.

- ▶ Discuss the range of strategies that could be used to cope with difficult tasks or changing situations

Levels 9 and 10/Personal and Social Capability/Development of resilience

Achievement Standard. They demonstrate persistence, motivation, initiative and decision-making through completion of challenging tasks. They evaluate personal characteristics, strategies and sources of support used to cope with stressful situations/life challenges.

- ▶ Analyse the significance of independence and individual responsibility in the completion of challenging tasks

Levels 7 and 8/Geography/Geographical Knowledge/Water in the World

Content Description: Causes of an atmospheric or hydrological hazard and its impacts on places, and human responses that can minimise harmful effects on places in the future

Elaborations:

- ▶ Explaining the economic, environmental and social impacts of a selected atmospheric or hydrological hazard on people and places, and investigating community responses to the hazard

Levels 7 and 8/Geography/Geographical Knowledge/Landforms and Landscapes

Content Description: Causes of a geomorphological hazard and its impacts on places and human responses that can minimise harmful effects on places in the future.

Elaborations:

- ▶ Describing how the effects caused by geomorphological hazards are influenced by social, cultural and economic factors. For example, where people choose to live, poverty, and lack of infrastructure and resources to prepare and respond
- ▶ Researching how the application of principles of prevention, mitigation and preparedness minimises the harmful effects of geomorphological hazards

For more information please visit the [Victorian Curriculum](#) site.

1. What is Disaster Resilience?

Learning intentions:

- ▶ Understand the meaning of personal resilience and disaster resilience
- ▶ Identify personal skills and attributes that can contribute to disaster resilience
- ▶ Explain how the Wye River community increased their resilience to the 2015 bushfire

Am I Resilient?

Life is full of hazards and challenging situations. Some days we make mistakes and experience the consequences. We usually learn to avoid making the same mistake or we learn to cope better with the consequences. Learning from past experience is an important first step in becoming more resilient.

School can be fun and a challenge at times. Every day we make decisions about how to prepare for and respond to challenges. We may do poorly in an exam because we didn't study. Not doing well, can leave us feeling disappointed. To avoid this feeling next time, we might make a commitment to do better and avoid negative consequences and disappointment. We might make a plan to ask for help and study more. If we follow the plan, we are more likely to perform better under the pressure of the next exam and do much better. When we improve we feel a sense of accomplishment and relief. When we learn from past challenges and take actions to better prepare and face future ones, we become more resilient.

The knowledge and skills that we use to solve everyday problems contribute to our ability to be resilient. Resilience is not something that individuals have or don't have, rather it is something that can be learned and developed in everyone.

Activity 1: Resilience challenge (🕒 20 minutes)

We sometimes take for granted that the things we do every day require knowledge and skills that we have developed since we were very young. All of these skills when combined contribute to our ability to be resilient. To be resilient we need to acquire knowledge and then put this knowledge into action.

- ▶ Working in pairs, take it in turns to ask each other the questions below and record the results
- ▶ If you answered YES to any of these questions, you have indicated you possess knowledge and skills that can help you to be resilient

Questions: *Please tick the box if your answer is YES.*

	Person 1	Person 2
Have you ever completed a difficult puzzle?	<input type="checkbox"/>	<input type="checkbox"/>
Have you caught a train or bus on your own or with friends?	<input type="checkbox"/>	<input type="checkbox"/>
Have you set a goal for yourself and achieved that goal?	<input type="checkbox"/>	<input type="checkbox"/>

	Person 1	Person 2
Have you attended school for a week without missing a day?	<input type="checkbox"/>	<input type="checkbox"/>
Have you ever found a task difficult but kept on trying?	<input type="checkbox"/>	<input type="checkbox"/>
Do you have a pet at home that you feed and care for?	<input type="checkbox"/>	<input type="checkbox"/>
Are you able to play a musical instrument?	<input type="checkbox"/>	<input type="checkbox"/>
Are you good at following instructions?	<input type="checkbox"/>	<input type="checkbox"/>
When you find a task difficult do you feel comfortable asking for help?	<input type="checkbox"/>	<input type="checkbox"/>
Have you got a younger brother or sister that you look after sometimes?	<input type="checkbox"/>	<input type="checkbox"/>
Have you been a member of a sports team?	<input type="checkbox"/>	<input type="checkbox"/>
Have you organised a party or event?	<input type="checkbox"/>	<input type="checkbox"/>
Have you ever alerted someone of a possible danger?	<input type="checkbox"/>	<input type="checkbox"/>
Have you walked to the shops on your own to buy something?	<input type="checkbox"/>	<input type="checkbox"/>

When you and your partner have answered the questions, choose one task that you have answered YES to and write a list of five skills or attributes that you possess that helped you to perform this task.

If it helps, you can select skills and attributes from the list below.

- ▶ Patience
- ▶ Empathy
- ▶ Cooperation
- ▶ Courage
- ▶ Persistence
- ▶ Listening
- ▶ Strength
- ▶ Planning
- ▶ Positive attitude
- ▶ Preparation
- ▶ Confidence

What is Disaster Resilience?

The skills that we use to solve everyday problems are the same skills that we can use to prepare ourselves to become disaster resilient.

Victoria is a great place to live, our natural environment is full of variety and beauty. Our landscapes range from sandy desert to snow fields, inland wetlands and rivers to rugged coastline.

We experience scorching summers and freezing winters. We also experience storms, floods and bushfires. These events are a natural part of our environment, but they can also pose a risk to our safety. As our climate changes, we are likely to see more frequent and intense floods, storms and bushfires, so it's really important that we know how to protect ourselves.

Activity 2: Resilience in Wye River (🕒 15 minutes)



Wye River and Separation Creek are small coastal towns along the Great Ocean Road. Both towns are situated in thick bushland which is prone to bushfires. On Christmas day, 2015, these towns were threatened by bushfires - yet all parts of the community were prepared and had planned for this possibility. On the day of the bushfire, community meetings were held, neighbours checked in on each other and the emergency services provided a steady stream of information.

As the bushfire approached, the community responded and implemented their well-rehearsed bushfire survival plans. While more than one hundred houses were destroyed, not a single person died and no one was injured. By working together to prepare a plan, and then evacuate early – the community members greatly reduced the harmful impact of the bushfire hazard. The recovery of the people and town is now likely to take less time and be less difficult than if they hadn't enacted their bushfire survival plans.

1. Did the residents of Wye River and Separation Creek understand the natural hazards in their local environment and the risks that they posed? How did they show this?
2. What action did the residents take to reduce their bushfire risk?
3. How did the communities of Wye River and Separation Creek reduce the impact of the bushfire?

Possible Answer:

The communities had well planned bushfire survival plans. The communities ensured no lives were lost by leaving well before the bushfire swept through the area. They removed themselves from the area and were therefore not exposed to the hazard.

Extension activity (⌚ 5 minutes)

Lead the class in a reflective discussion about the lesson. You could ask?

- ▶ If there was a hazard event here tomorrow, how resilient would be you be? How resilient would the community be? Why?
- ▶ Do you have any other thoughts about the 2015 Wye River bushfire?

2. Our Local Hazards

Learning intentions:

- ▶ Identify which hazards are most likely to occur in the local area
- ▶ Interpret risk maps to determine which locations could be impacted by a hazard event

Activity 1: Brainstorming hazards (🕒 10 minutes)

Storms, floods and bushfires can be dangerous and pose a risk to people and property. Recognising local hazards is the first step to becoming disaster resilient.

1. In groups, list as many natural hazards as you can.

Student lists will be likely to include flood, storm, bushfire, tsunami, earthquake, cyclone, tornado, heatwave, drought, snow/ice storm, volcano, and disease.

2. Circle the hazards that could occur in your own local area.

Teacher note: The most common natural hazards in Victoria are floods, storms and bushfires.

Activity 2: Hazard investigation (🕒 15 minutes)

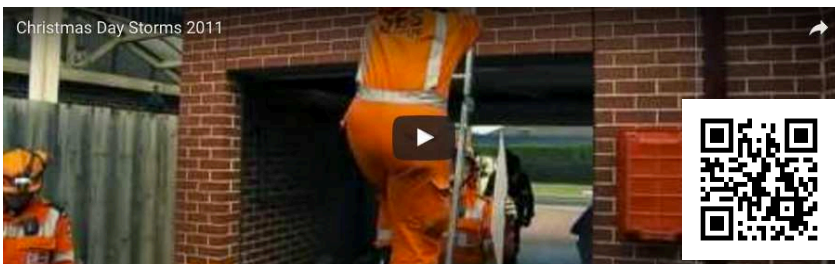
Floods



1. Watch the video 'FloodSafe: Be Prepared.'

List some of the impacts flood can have on people and property.

Storms



1. Watch the video of the Christmas Day Storms in 2011'.

2. List some of impacts severe storms can have on people and property.

Bushfires



1. Watch the video 'Lessons from the past: Three major Victorian bushfires.'

2. List some of the impacts bushfires can have on people and property.

Scan these QR code to watch the videos

Activity 3: Your local hazards (🕒 15 minutes)

One of the first steps in becoming disaster resilient is to identify the hazards in the environment where we live, work or travel. Storms, floods and bushfires all present different dangers that we must understand.

Bushfires

In pairs or small groups:

1. Go to emergency.vic.gov.au
2. Click on 'Prepare and Get Ready'
3. Type your school or home address into the search bar
4. Click on Filter. In the drop down menu, select 'Bushfire History - 50 years'

Small group discussion

1. What do the red areas mean?
2. Has there been a bushfire in your area in the past 50 years? How close did it come to your school or house?
3. Could there be a bushfire in your area in the future?

Floods

In pairs or small groups

1. Go to emergency.vic.gov.au
2. Click on 'Prepare and Get Ready'
3. Type your school or home address into the search bar
4. Click on Filter. In the drop down menu, select 'Flood likelihood – 100 years'

Small group discussion

1. What do the blue areas mean?
2. Could other parts of your community be flooded?
3. Could your house or school be flooded in the next 100 years?

Extension activity (🕒 5 minutes)

Lead the class in a reflective discussion about the lesson. You could ask:

- ▶ How did this activity change your understanding of your local hazards?
- ▶ After your investigations, which hazards are of most concern to you? Why?

3. Disaster Vulnerability

Learning intentions:

- ▶ Identify how hazards can impact on people and property
- ▶ Identify what makes someone vulnerable to the impacts of a natural hazard
- ▶ Explain how a natural hazard can become a natural disaster

What causes disasters?

A natural disaster occurs when a community is unable to protect itself from the impact of a hazard event and there is widespread damage to property and or possible loss of life.

Natural hazards don't inevitably lead to a disaster. A disaster only occurs when a natural hazard impacts upon a vulnerable community.

Natural Hazard + Vulnerable Community = Disaster

Vulnerability is the diminished ability of an individual, group or community to anticipate, cope with, resist and recover from the impact of a natural hazard.

People can be vulnerable if:

- ▶ They don't understand the local hazards or the impacts they can have
- ▶ They have no access to information about how to protect themselves or their property
- ▶ They don't have the resources they need to take action to protect themselves and their property

Flood

Read Case Study 1 on the 2011, Grantham Floods, located on page 14

In pairs or small groups, discuss and record your responses the following questions:

1. What were the impacts of the flood?
2. What made people vulnerable to the impacts of the flood?

Fire

Read Case Study 2 on the 2009, Black Saturday Bushfires, located on page 20

In pairs or small groups, discuss and record your responses the following questions:

1. What were the impacts of the bushfire?
2. What made people vulnerable to the impacts of the bushfire?



CASE STUDY 1: Grantham and Lockyer Valley Floods 2011

On 9th and 10th of January 2011, heavy rainfall caused flash flooding to occur across parts of Queensland resulting in 35 fatalities and widespread damage to property. Grantham, Lockyer Valley and Toowoomba were severely impacted. Due to landslides caused by flooding, and water blocking the Warrego highway, the Lockyer Valley became isolated; police and emergency services were no longer able to access the area. Excessive fog and rain prevented helicopters flying overhead during the emergency.

Residents of these areas received no warning, unlike the larger towns of Brisbane and Ipswich. The Tsunami like force of the flood was unlike anything that could have been anticipated.



The town of Grantham after the 2011 flood.

... you've got cars up in the trees meters off the ground. Whole buildings taken off their stumps and moved ... in some cases almost kilometres ... it's just a mess.

– Steve Jones, Mayor of Lockyer Valley

Of the 35 people who died as a result of the 2011 Queensland floods, 21 deaths occurred in the Toowoomba and Lockyer Valley area.

The community felt a false sense of security after the construction of the Wivenhoe dam in 1974; therefore many homes and businesses had been built on floodplains. The dam was designed to lessen the risk of such disasters but could never have completely eliminated the risk. Due to unprecedented rainfall over this period, the dam was unable to hold the massive volume of water.

There were many survivors rescued from rooftops and tree tops in the following days; victims also assisted the rescue of other members in their community. Extraordinary feats of resilience and bravery were demonstrated by the people affected. Listening to the stories of survivors allows us to learn and better understand what made people vulnerable to the flood impact, and the role 'human factors' play in how disaster events unfold.

Flood preparedness

Many people in the community felt a sense of complacency about flood risks prior to the events of 2011. The Wivenhoe dam gave those residing in low lying areas a false sense of security. They did not have an understanding of the risks during extreme weather, despite severe floods having occurred prior to the construction of the dam in 1974.

I was complacent and thought we were safe. I thought there would never be a bigger flood ... The attitude that "it will never happen" is no longer an option.

– Mr Keep

Many people in the community found it difficult to believe their neighbors who were spreading the word of the floods imminent threat.

I was told to get out of Grantham because there was a big wall of water coming and that Grantham was going to go under, I found it difficult to believe that water in the Lockyer Valley could reach that height.

– Mr Warburton

She told me about the wall of water coming to Grantham and I didn't believe it, I told her she sounded like she was panicking.

– Grantham resident

The community is now more aware of the flood risk to their area and the factors that make them vulnerable.

Don't be complacent about the risk of natural disasters which strike suddenly. Don't expect warning. Don't rely on anyone to save you. Be prepared to protect your own family.

– Mr Keep

I think the most important thing to learn is that there will be more floods in the future and a fair amount of preparedness and pre planning would be very useful to help minimize their damages.

– Geoff Heatherwick, BOM hydrologist.

Flood survival plans

Many residents did not have flood survival plans ready to implement in the event of an extreme flash flood. If they were able, most residents climbed to safety on rooftops.

I experienced the 1974 flood when the quarry had not yet been developed. The water had never reached my property.

– Mr Sippel (Grantham)



By stacking furniture together I made a stairway and got my daughter and two grandchildren to the safety of the roof.

- Grantham resident

Some people had basic plans of how to escape flood waters that were not adequate because of the unexpected severity of the situation.

I had planned to escape across towards the railway line if necessary but the situation was worse. The water was flowing at a terrible pace, breaking like rapids over a stream.

- Mr Warburton (Grantham)

Warnings and rescue

Residents of Grantham and Lockyer Valley received no flood warnings, news of the disaster only spread by word of mouth if it was received at all. Other people were only alerted to the danger when it became visible.

Grantham and us and all the little places just got forgotten about when there's a big city like Ipswich and Brisbane under water.

- Lockyer Valley resident

Why were authorities not able to warn people in seven towns in Toowoomba and the Lockyer Valley that the worst flash flooding in at least a century was about to strike ...? How could such a sudden and catastrophic flood claim three members of his family within minutes?

- Mr Keep

Some residents of Grantham perceived the dangers early and warned neighbours.

I knew people should be warned. While I was making calls I saw Lockyer Creek break its banks and flood the area of land between my house and the creek. Within 5-10 minutes the water had reached the level of the windows of my house.

- Mr McIntosh (Grantham)

My daughter phoned me to say that she had seen a warning on television about a "wall of water" in Toowoomba. She told me to please listen to her and told me to get home and get as high as I could.

- Ms Mahon (Grantham)

Emergency services were overwhelmed during the disaster. Triple zero operators advised people to stay indoors to avoid being swept away.

... on a typical Monday the 000 line in Toowoomba receives about 60 calls, on this day 883 such calls were received.

- Grantham resident

Many managed to escape onto rooftops and trees if they were able. Once helicopters were permitted to fly through the area, people were rescued from these positions.



I went upstairs and sat on the verandah to watch the water rise. I got worried so I tore the awning off the back verandah so that it didn't block the path to the roof.

- Grantham resident

Helicopter rescue crews were shocked at the number of people stranded on roof tops needing to be rescued.



Flood waters rage through the Lockyer Valley.

Attempts to evacuate and escape flood waters

Residents of Grantham and Lockyer Valley were not advised to evacuate the area so most did not manage to do this in time.

There was no evacuation plan, that's the whole point, there was no disaster management plan ... It all sounds really lovely that the quarry has given us an extra three minutes which is fantastic, but we had no idea it [the water] was coming anyway.

- Grantham resident

There was a huge rise between 3:30pm and 3:40pm ... the breach quickly became a metre-high wave of water which travelled between two and four kilometres-an-hour towards Grantham ... At the very front of the water moving ahead, that's where you will see the wave; in the same way if you're at the beach and you're looking at the wash coming up ... You'll see turbulence as the wave tumbles over itself over the dry land.

- Dr Macintosh



Most residents had no time or opportunity to evacuate once they became aware of the dangers. They were also unaware how quickly and dramatically the flood waters would rise, eventually reaching rooftops. This hampered decision making.

They told me quick get out there's a five foot wall of water coming so I jumped in the fire brigade [truck] and I got out with them to safety. The rest of Grantham, I heard the sirens going through there and they wouldn't have had a chance to get out.

– Robert Merideth

We all went into the kitchen and I called the SES and told them that water was all around the house and still rising and that we would need to be rescued. Then the back glass sliding doors broke ... By then the option of running to the railway was gone. And the option of climbing to the roof was gone ... The current around the house was running very fast.

– Mr Keep

Some people were almost trapped in their homes and drowned but managed narrow escapes.

There was no power and the water was blocking daylight. I found myself eight inches from the ceiling. In desperation, I dived underwater and swam out the door of the shop.

– Mr Warburton (Grantham)

Dangers of driving through flood waters

Some people attempted to travel through flood waters in vehicles.

My mother's car floated away. It had been parked on the road at the front of the property. My mother then suggested we call the SES to be rescued.

– Mr Keep

The Perry family became stranded in their car as flood waters rose. They managed to climb out of the windows and onto the roof of the car at the last minute. Channel 7 helicopters spotted the family but by the time they returned to rescue them the car had disappeared. The family members were found nearby clinging to tree branches and their 9 year old son on top of a floating cattle feeder. Unfortunately one family member was swept away.

Damage to property and dangers of flood waters

People's homes were rapidly inundated with water which quickly rose to rooftops, washing away cars, equipment as well as sheds and some houses.

With each wave the water level became higher and higher and spread further onto my property. By 3:17pm I could see the Creek carrying away boats and massive trees. By 3:24pm my shed was completely under water. My tractor was swept aside and my shed was ripped out of the ground.

– Mr Zische (Lockyer Valley)

A surge of water came through the front door and smashed the two front windows inside. I began treading water.

– Mr Warburton (Grantham)

Water rose suddenly carrying debris that proved destructive to homes and people caught in the flood water.

A great amount of debris was coming down the creek and the roar of the water was astonishing.

– Grantham resident

A python slithered across the debris in the water and into the wheel hub of the sinking car. Rats also began to climb into the car.

- Grantham resident

A shipping container floated past me down the street.

- Grantham resident



CASE STUDY 2: Black Saturday

The fire danger weather in Victoria on Black Saturday was the worst on record. By mid-afternoon, hot north- westerly winds were blowing at 125km/h and temperatures in Melbourne had peaked at 46.4°C. On the back of a 12 year drought, the vegetation was tinder dry and once fires had started there was very little the fire services could do to contain them.

By Sunday morning, 143 people had died and over 2000 houses had been destroyed. This was the worst bushfire disaster Australia had ever seen.

While the Black Saturday bushfires were the most extreme on record, it is important to understand the role that 'human factors' played in the disaster. By listening to the stories of survivors, we can learn a lot about what made people vulnerable to the impacts of the fires.



The red glow over the streets of Trafalgar 7th February 2009 during the Black Saturday bushfires in Victoria.

Bushfire preparedness

Many people hadn't done anything to prepare their property for bushfire. For some people, it hadn't been a major priority. They may have mowed the lawn, but they did this to keep the property neat and tidy, not to reduce the fire risk.

I hadn't taken any measures or anything. I mean, all I did was basically keep the grass cut all the time...Not because of bushfire reasons, only because I wanted it neat.

– Flowerdale

Some people living in towns or suburbs didn't think they would ever be impacted by a bushfire. They thought that bushfires only affect people in 'the bush', so they'd done very little to prepare.

We hadn't really done anything to prepare. We're not in what you'd call forest country...It's not as though you're in the Grampians or something like that, in the bush. We're not in the bush in that manner.

– Horsham

It wasn't just suburban residents who had underestimated the risk. Some people in bush areas, like Marysville, had also misjudged their level of danger and didn't see any reason to prepare.

My wife works in the op shops and things in town and she knows a lot of the locals and she said to them "Have you cleaned the leaves out of the gutters and done anything for Saturday? They're warning that it's going to be a very bad day". And they all said "Oh no, Marysville will never burn". That was their attitude you know, Marysville will never burn.

– Marysville

Bushfire survival plans

On the day of the fires, many people didn't have a bushfire survival plan. Some people knew that they needed a plan - they just hadn't gotten around to making one. I didn't have a plan...I didn't have water tanks...That was always a project that I put off for another weekend.

– Marysville

Other people hadn't made a plan because they didn't have the necessary knowledge or skills:

I didn't know what to do as far as a fire plan goes because I'm not an expert on bushfires.

– Kinglake

Some people in suburban areas hadn't made a plan because they didn't think they would ever be affected by a bushfire.

We never had a fire plan. We thought we did...if the house caught on fire, we had a plan: go out whatever door you can, wherever the fire isn't. But outside of the property, you didn't think about it. It's just one of those things. You're living in a suburban area – you don't think the whole streets going to catch on fire.

– Narre Warren South

Some people had made a bushfire survival plan but when confronted with the fire, they realised that their plan was far from adequate. Well, see I thought I had a plan, but as it turned out I totally didn't. I talked to my friend afterwards about what their fire plan was, and I realised that what we had done was very minimal compared to what people who know about bushfire actually do.

– Labertouche



Warnings

In the lead up to Black Saturday, people were warned that the fire danger was extremely high. On the Friday evening, the Premier John Brumby had given Victorians a stark warning. Appearing on the nightly news bulletin, he said:

“Tomorrow is going to be worst day in the history of the State... I can’t stress this enough, I know that the chief fire officer has been out and he said it will be as bad as you can get and he’s not exaggerating.”

However, many people didn’t see this message as applying to them. They just didn’t think they could ever be affected by bushfire.

I didn’t really think about it...I mean, I thought about it, not for ourselves, but to the point of other people, ‘cause I know people that live in fire danger areas but certainly didn’t think a fire would come through here.

– Narre Warren South



The Lake Mountain toboggan run two months after the Black Saturday bushfires.

Well we did get information a few weeks prior that it was going to be a really bad season, okay. And we are guilty of it – we weren't prepared for it. We didn't actually take any notice of it to be honest.

– Marysville

Black Saturday was Victoria's hottest day on record. This meant that many people were trying to keep cool in the air-conditioned comfort of their homes. To keep the house cool, some people had also drawn the curtains, so they weren't able to see or hear any signs of an approaching fire. They were completely unaware of what was happening around them.

We just decided to have one of those really ridiculous days where you lay back and watch a DVD. And so we'd pulled all the blinds and then the house stays nice, you know, has a better chance of keeping a reasonable temperature. So we had pulled all the blinds and we had the air-conditioner on in there and we had this DVD blaring really loudly.

– Mike, Hazelwood

For people who were monitoring the fire threat on the TV or radio, a lack of up-to-date information prevented access to advanced warnings.

I went to the CFA website and I also went to the DSE website, but the DSE website was so slow. They were probably about three hours behind in their information.

– Kinglake

Some people said that they got no warning at all.

Well the main thing was that if you listened to the radio, there was absolutely no warning at all. This is not a criticism, but no one up here knew.

– Pheasant Creek

We had no idea the fire was coming, so we were in the swimming pool. But we had no warning. Two years ago when there was a fire there was a lot of communication. But we didn't know this was coming.

– Pheasant Creek

Last minute evacuations

The lack of warning meant that many people tried to evacuate at the last minute.

No-one was ready for this fire. It was too quick. It was on them. That's where all the trouble started: people trying to get out at the last minute. All I know is that some people were killed in cars that were just trying to get out at the last minute, which was a real no-no, as we know.

– Calignee



I always got told that we'd get plenty of warning, but none of that happened. I thought that the police would come around and tell us to evacuate. I think it really caught everybody by surprise. I think we got out 10 minutes before the mad dash.

– Flowerdale

These last minute evacuations were extremely dangerous. Thick smoke made driving difficult and fallen trees were blocking the roads. Some people made it out safely, but others weren't so lucky:

All the embers were coming down and it went black all of sudden - it just went completely black. You couldn't see two feet in front of you and we just said 'Get in the cars and go'. We just threw the dogs, the two cats and the kids in the car and we took off down the road. We were told to go to the CFA in Kinglake. So we got down there and we could see cars behind us blowing up on the way down. There were three or four cars on our corner that didn't make it.

Sheltering in bathrooms

For some people, leaving just wasn't possible. By the time they'd become aware of the fire, it was too late to try and escape. Some of these people made the dangerous decision to shelter in bathrooms and this caused a high number of fatalities. Perhaps they thought the bathroom would be safe because there is water in there, but the bathroom is probably the most dangerous place you could go.

Lots of people I know died. Why? Because they were all in the bathroom and the bathroom hasn't got an external door, and the bathroom hasn't got a big enough window to get out of.

– Marysville

Staying to defend

Many people decided to stay and defend their properties and many were successful. But others weren't as prepared as they needed to be. Some people were relying on simple plastic garden hoses that melted in the heat.

Once the fire front went through, the wind was still blowing. We realised that our pumps and hoses and everything had melted and we just used metal buckets with a mop.

– Hazelwood South

Other people didn't have access to water for fire fighting. During a bushfire, everyone is drawing on the mains water system, so the water pressure drops down to a trickle.

As the fire approached, I came into the house. When I thought it was safe I went out and tried the hose but there was no water pressure. So I had three buckets and two mops and was going along beating the flames with the mops. Looking back now, we should have better facilities to fight the fire...without water you can't really do much can you?

– Bendigo



During the fires, the electricity went down and people were left without power. This meant that unless you had a backup generator, you couldn't pump water up from your dam or your tanks.

So we filled up everything that we could. And then we lost power...so we had no water. So then we were just basically waiting.

– Kinglake West

For some people, the cost of fire fighting equipment had prevented them from being as prepared as they wanted to be. They just had to try and make do with what they had on the day.

There's a fine line you know. You can spend money on diesel generators which will last longer, but instead of 1,000 they're 5000 bucks....We knew the risk and but once again, there's only so much you can do you know.

– Koornalla



Extension activity

Lead the class in a reflective discussion about the lesson.

You could ask:

- ▶ When does a hazard event become a disaster?
- ▶ Can you think of people in your community who might be vulnerable to the impacts of a hazard event?
- ▶ Would you or your family be vulnerable to the impacts of a hazard event? Why/why not?
- ▶ Find out as much additional information as you can about the case study events.

4. Becoming Disaster Resilient

Learning intentions:

- ▶ Understand our capacity to use resources and skills to reduce hazard impacts and increase resilience
- ▶ Locate information online about what people can do to reduce the impacts of hazards

Building Resilience

We all have skills and attributes that assist us when coping with difficult situations. Using these skills and attributes, combined with the use of available knowledge and resources, provides us with the capacity to reduce the impacts of natural hazards.

We can use our capacity to prepare, plan and act when a natural hazard threatens to impact our community.

Activity 1: Animation (© 10 minutes)



Scan these QR code to watch the videos

In pairs: Watch the animation and make a list of what people can do to protect themselves from natural hazards. Write down as many of these as you can. You can watch the animation multiple times to make sure you get them all.

Teacher's note: Here is the full list of actions:

- ▶ Leave the area when there is a risk of fire , flood or storm
- ▶ Remove trees from around the property
- ▶ Put sprinklers on the roof
- ▶ Put shutters on the windows
- ▶ Observe weather conditions
- ▶ Listen for warnings
- ▶ Find information and advice about what to do to keep safe
- ▶ Monitor weather and warnings
- ▶ Take action

Activity 2: Finding information (🕒 30 minutes)

Taking Action

Knowledge of natural hazards and risk is important. But we also need to act. In an emergency, our minds can become overwhelmed. Thinking and making good decisions can be difficult. If we prepare and rehearse what to do in an emergency, we are more likely to act in a safe way when disaster threatens.

Prepare and Get Ready

Use the 'Prepare & Get Ready' section on the Vic Emergency website emergency.vic.gov.au to find the information required to complete these activities.

Floods

- ▶ Go to emergency.vic.gov.au
- ▶ Click on Prepare and Get Ready
- ▶ Click on Flood

In pairs:

- ▶ Watch the short FloodSafe television commercial. Why should you never swim, play or drive in floodwater?

Answer: Floodwaters contain broken glass, raw sewerage, trees, decaying animals, chemical waste and deadly debris.

- ▶ List the 3 types of flooding that can occur. Is your home or school at risk from any of these types of flooding?

Answer: Riverine flooding, Flash flooding and Overland flooding

- ▶ What can you do to prepare for a flood event?

Answer: Check if your home and contents insurance covers flooding, Keep a list of emergency numbers near the telephone. Put together an Emergency Kit and prepare a home or business Emergency Plan

- ▶ List the types of flood warnings that are issued by the Bureau of Meteorology.

Answer: Flood watch, Flood warnings – Minor, Moderate, Major and Severe Weather Warnings – Severe Thunderstorm Warnings

- ▶ If flooding may happen soon, what can you do to respond?

Answer:

- 1. Make sure your family members and neighbours are aware of what is happening.*
- 2. Be ready to evacuate. Act early. Conditions change rapidly. Roads and escape routes can be covered or blocked. Don't forget to take pets and medicine with you.*
- 3. Put household valuables and electrical items as high up as possible.*
- 4. Turn off water, gas and electricity at the main supply.*
- 5. Secure objects likely to float and cause damage. Raise chemicals and oils well above the forecast flood height.*

Storms

- ▶ Go to [emergency.vic.gov.au](https://www.emergency.vic.gov.au)
- ▶ Click on Prepare and Get Ready
- ▶ Click on Storm

In pairs:

- ▶ List 3 things you can do to reduce the impact of a storm on your home
- ▶ List 3 things you can do during a storm to stay safe
- ▶ List 3 things you can do after a storm that will help you to recover and stay safe

Bushfires

In pairs:

- ▶ Go to [emergency.vic.gov.au](https://www.emergency.vic.gov.au) and watch the short video titled “How to be prepared for fire”

Find answers to the following questions:

- ▶ Who can you talk to about preparing for fire?
Answer: You can talk to your household and neighbours.
- ▶ When is the best time to leave if fire threatens?
Answer: The best time to leave is early
- ▶ Under the heading, Risk of Fire – click on Prepare your property
- ▶ List 5 things you can do to prepare your property for the bushfire season
- ▶ Under the heading, Risk of Fire – click on the Fire ready quiz
- ▶ Complete the Fire ready quiz to test your bushfire knowledge?

Extension activity (⌚ 5 minutes)

- ▶ What is capacity? What role does it play in disaster resilience?
- ▶ What are the most important things people can do to increase their resilience to flood, bushfire or storm?



5. Taking Action

Learning intentions:

- ▶ Identify achievable disaster resilience activities that could be undertaken at home or school
- ▶ Formulate a plan for the successful completion of an action or activity that would increase disaster resilience at home or at school
- ▶ Identify potential obstacles to taking action and formulate strategies for overcoming those obstacles

Throughout the past four lessons we have investigated the natural hazard risks presented by fire, flood and storm to our local school and community. We have discussed ways to increase our capacity to become more disaster resilient and have carefully considered the factors that may contribute to communities being vulnerable to hazard risk. We have acquired knowledge and skills that will help us to take positive action to help us plan, prepare and respond to our local hazard risk and made a commitment to implement an action plan.

Activity 1: Case Study – Tilly Smith (© 10 minutes)



Watch the video titled 'Lesson Save Lives' and respond to the questions below.

- ▶ What was the hazard?
Answer: Earthquake and tsunami waves.
- ▶ Why were people vulnerable?
Answer: No tsunami warning system, little knowledge of how to read the signs of tsunami, on holidays in foreign country so no emergency plan in place.
- ▶ What actions did Tilly take to save lives and help reduce the impact of the disaster?
Answer: She used her knowledge of tsunami warnings signs, she alerted her father who alerted security and they evacuated people from the beach to higher floors in the hotel, they took action when it was needed.

- ▶ Where did Tilly learn about the warning signs of a tsunami?

Answer: Tilly learnt about tsunami at school.

Activity 2: Disaster resilience action plan (⌚ 30 minutes)

Once we have identified the hazards in our area we can take action to reduce the impacts. The ability to formulate a plan of action is an important step in becoming disaster resilient.

Working alone or in pairs:

- ▶ Choose a local hazard that could affect you – bushfire, flood or storm
- ▶ Decide on an action or activity you can undertake to reduce the impacts of that hazard – make sure it is achievable
- ▶ Taking action requires planning. You need to think about what you will need to do to reduce the risk, who should be involved, the obstacles and challenges you might face and how to deal with them

What action are you going to take?

How will this increase resilience?

What resources will you need?

Who else should be involved?

What obstacles and challenges might you face?

How might you overcome these obstacles and challenges?

Extension activity (⌚ 5 minutes)

- ▶ Do you feel confident that you will be able to take the necessary steps to put your plan into action?
- ▶ Is there anything you could do as a class to make your school community more aware of natural hazard risks in your local area?

