

Children as Bushfire Educators - *Just be Calm, and Stuff Like That*

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Abstract:

The limited evidence regarding disaster-related environmental education programs for children indicates that these programs can increase disaster resilience and family preparedness activities, and reduce children's fear and anxiety. However, the literature lacks qualitative studies to provide insights into children's experiences of disaster education programs, the programs' influence on citizenship opportunities in disaster risk environments, and follow-ups with children impacted by actual disasters. This paper reports on a pilot study in Victoria, Australia, of the Survive and Thrive program, an environmental education program delivered by the local fire brigade and incorporated into the school curricula for upper primary school children in Anglesea, a coastal town rated as having an extreme risk of bushfires.¹ A mix of longitudinal qualitative methods captured children's experiences and the program's impact on child agency. The results showed that the children enjoyed the Survive and Thrive program and valued the life skills they acquired. The children demonstrated knowledge and skills gained in monitoring environmental risks and bushfire behavior, as well as a more nuanced understanding of the different civic roles of adults and children in responding to a bushfire in different contexts. Faced with the reality of a nearby bushfire during the summer holidays, children demonstrated their capacity for critical thinking and application of their knowledge to support appropriate action.

Key words: Holocaust education, testimonies, teacher training, empathy, critical pedagogy

¹ According to the Victorian Fire Risk Register.

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Introduction

Children have the capacity—but limited opportunity—for citizenship in relation to community-based bushfire preparedness activities (Anderson, 2005; Peek, 2008; McDermott & Cobham, 2012). The need to keep children safe from risk can often override opportunities for citizenship, despite the inclusion in the UN Convention on the Rights of the Child (UNCRC) of children’s right to participate in decisions affecting their lives (UNCRC, 1989). Case studies in developing countries have demonstrated children’s capacity to contribute to awareness-raising in adults (Izadkhah & Hosseini, 2005; Mitchell, Haynes, Hall, Choong, & Oven, 2008), but there is limited evidence of this in developed countries.

Disaster preparedness and prevention environmental education programs are a primary strategy for promoting child and youth safety, decision-making skills, and resilience. A critical review of the literature on these programs showed a recent surge of studies in this previously under-researched field (Ronan, Alisic, Towers, Johnson, & Johnston, 2015). This research indicates that disaster risk reduction programs can achieve their objectives to increase resilience, reduce risk, promote home-based disaster reduction activities, and reduce disaster-related fears. There are early indications that child and parent discussions about the children’s involvement in a disaster education program predict increased home-based DRR/preparedness activities (Ronan et al., 2015). A study of preschoolers in Iran showed the capacity of very young children to learn some of the key messages about disaster safety (Izadkhah & Gibbs, 2015). However, the strength and range of types of evidence of the effectiveness of disaster education programs is limited and in some cases contradictory, and so more rigorous studies are required to determine what works and for whom, when, and why, and to understand children’s experiences of the program (Ronan et al., 2015). Studies examining the impacts of disaster education programs on children’s critical thinking, decision making, and emotional response to an actual disaster are absent from the current literature (Johnson, Ronan, Johnston, & Peace, 2014; Ronan et al., 2015).

A current pilot study of the Survive and Thrive program in Victoria, Australia, is emphasizing the capacity of children as disaster educators. The program is delivered by the Anglesea Fire Brigade of the Country Fire Authority (CFA).² Local primary school children attend the local CFA Fire

² The Country Fire Authority is a government-funded and insurance-levied agency consisting of management, education, and administrative staff and a predominantly volunteer firefighting service throughout rural Victoria, Australia, responsible for fighting bushfires that occur on private land.

Station for biweekly classes. They learn about living in their bushfire-prone environment, identify risk, and learn about preparedness and response. They use this knowledge to help educate their families, other students in the school, and students visiting from other areas with very high to extreme bushfire risk.

This paper reports on the findings from a pre and post mixed method qualitative assessment of the program. The aim of the evaluation was to explore children's experience of the Survive and Thrive program and the impact on their sense of agency and capacity to respond appropriately to bushfire risk given the high-risk environment in which they lived. The evaluation was able to incorporate children's actual experiences of bushfire risk because of a bushfire that occurred in the region prior to the follow-up evaluation.

Setting

This study was conducted in Anglesea, a small town in the Surf Coast Shire of Victoria, Australia. Anglesea is a popular tourist destination for Australian and international visitors and has many school camps located in the surrounding bushland. It is an extreme bushfire risk area with a history of major bushfires, including devastation in the Ash Wednesday fires in 1983, which resulted in 75 fatalities and the loss of over 2,545 homes across Victoria and South Australia. On Christmas Day, 2015, a bushfire impacted Wye River and Separation Creek townships on a nearby section of the coastline; this fire corresponds with the final stage of the study.

Survive and Thrive program

The CFA developed the Survive and Thrive program in partnership with Anglesea Primary School, a small rural school with just over 100 students at the time of the study. Utilizing a student-led approach, students from the final term of Grade 4 through Grade 6 (ages 10-12) were taught bushfire behavior and explored bushfire knowledge and understanding to increase their own and their communities' resilience to bushfires in their environment (see Box 1). The Survive and Thrive program was integrated across all curriculum areas with an emphasis on Humanities and Social Studies (HASS) and Science, Technology, Engineering, and Math (STEM) subjects. The focus was on building children's knowledge, skills, and sense of efficacy to promote resilience in a disaster risk area. The classes were held in the CFA Anglesea Fire Station and included experiential learning with CFA equipment and field visits in the Great Otway National Park. To support the students' learning, the partnership included many formal and informal relationships between

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local and state organizations, emergency management professionals, and the University of Melbourne, including provision of environmental sensors by the Melbourne School of Engineering to support the environmental monitoring component of the program. The later stages of the Survive and Thrive program concluded with the students designing and delivering bushfire education workshops to their families, peers, community, and other schools.

Box 1: Survive and Thrive Activities

Activities	Year Level
At the end of Grade 4, the students begin their introduction to the CFA Fire Brigade, Radio Communications, and how to use field weather instruments.	Grade 4
<p>Grade 5 begins with a series of bushfire behavior lessons about the principles of fire, weather, landscape, forest fire danger index calculations, fire danger ratings, overall fuel hazard calculations, map reading, hand plotting of predicted fire behavior, fire investigation, local traditional aboriginal fire use (cultural and environmental fire), fuel reduction, and local brigade fire history.</p> <p>During the second half of Grade 5, students practice what they have learned and start to develop presentation skills. As a soft introduction, the students coordinate a tour of the fire station and a workshop with their family.</p> <p>During the last term of Grade 5, students create workshop/presentations that share a message with the audience as to how they can “Survive and Thrive” in a bushfire. As a student-led process, these workshops are conceptualized by the whole cohort with students selecting or being allocated to groups. Each group then proceeds to develop its workshop.</p> <p>At the end of the term, the students present their workshops for the first time to their families and local fire agencies.</p>	Grade 5
In Grade 6, the students deepen their knowledge of bushfire behavior and continually improve their workshops for presentation to a variety of audiences from their town, local towns, and visiting school groups from other bushfire risk areas.	Grade 6

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Theoretical framework

This study was informed by the Sociology of Childhood *citizen child* framework, which is child-centered and considers the rights and capacity of children to have agency in their own lives (MacDougall, 2009). In doing so, it employed a rights-based approach that is consistent with the United Nations Convention on the Rights of the Child (UNCRC, 1989).

Evaluation methods

The evaluation consisted of a mixed method assessment of the impact of the Survive and Thrive program on children's sense of agency in relation to bushfire risk and response.

Recruitment

All children in Grade 4 (aged approximately 10 years) at Anglesea Primary School in late 2014 were eligible for participation in the evaluation. Plain language statements were sent home via the school for parents/guardians and children to provide written informed consent.

Data collection

The data collection methods included a repeated visual mapping class activity and follow-up interviews.

Visual mapping. A class-based activity was conducted in 2014 before the Grade 4 children began the Survive and Thrive program in the final term of school. It was repeated in class with the same children in late 2015. The researchers obtained parent and child consent to access this data for the research analysis. The class activity involved a visual mapping technique as an aid to make it easy for children to understand and respond. Visual approaches can be useful in qualitative research to make the concepts more accessible for the research participant and the responses more explicit for the researcher (Butler-Kisber & Poldma, 2010). The children were provided with four different sheets of paper, each with a diagram of a circle split into sections representing home, school, and Anglesea community. Space was also left for "other" in case other settings were referred to by the participant (e.g., grandparents' house). The children were then asked to write their responses to the following questions as single words or phrases in each sector of their circles:

- 1) Who provides you with bushfire information and support? (If you are at home/at school/in Anglesea/somewhere else.)

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- 2) Who do you provide bushfire information and support to? (If you are at home/at school/in Anglesea/somewhere else.)
- 3) How does the word “bushfires” make you feel? (Name up to 3 feelings that come to mind if there is a bushfire and you are at home/at school/in Anglesea/somewhere else.)
- 4) What would you do in a bushfire? (Name up to 3 actions if you are at home/at school/in Anglesea/somewhere else.)

Interviews. Individual semi-structured interviews were conducted with the participating children at school in early 2016. Semi-structured interviews are one of the most common methods used for qualitative data collection. They are useful for exploring the participant perspective because they are guided by a series of open-ended questions or prompts from the researcher, with scope for additional issues and questions to be raised and discussed by both the researcher and the participant (DiCicco-Bloom & Crabtree, 2006). The interviews were conducted in the first term back at school following the Christmas holiday break when bushfires had occurred in the local area. The interviews explored children’s expectations and experiences of the Survive and Thrive program, their perspectives on potential bushfires and the role of the CFA, their parents, teachers, and themselves, and their family experiences of the nearby bushfires.

Data analysis

Visual mapping analysis. The data from the visual mapping activity was combined and grouped into sectors. Words that were very similar were adjusted slightly to match (e.g., “scary” and “scared” would both be listed as “scared”). The adjusted data was then entered into the online platform “Wordle” (<http://www.wordle.net/>) to create visual representations of the combined data, with the most commonly used words appearing in larger font. This representation enabled systematic comparison of grouped responses in different settings and examination of changes over time to develop a preliminary analysis of the impact of the Survive and Thrive program on children’s perceptions of bushfire experiences and appropriate responses in different contexts (Jackson & Trochim, 2002).

Interview data analysis. The interview data was coded and categorized and then analyzed using inductive thematic coding (Green et al., 2007). Similarities and differences within and across categories were examined to develop an in-depth understanding of children’s experiences of the

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Survive and Thrive program and evolving perceptions of their own roles and the role of others over time and in response to a nearby bushfire threat.

Multiple methods - integration of data. The data collected from the two different forms of data collection was integrated at two points in the research process. First, the individual visual mapping activities completed by the children were used as additional prompts during the interviews to explore their sense of agency and to understand the reasons for any changes in their responses over time (Butler-Kisber & Poldma, 2010). Second, the preliminary analysis of the combined visual maps was integrated with the analysis of the interview data to provide greater breadth and depth to the development of a conceptual understanding of children's experiences of the Survive and Thrive program (Nastasi, Hitchcock, & Brown, 2010). This was then compared to the existing empirical literature to address gaps in the evidence base.

Reporting

To protect the anonymity of the child participants, identifying information has been removed from accounts. Additional measures have been taken to provide internal confidentiality—an ethical issue when a small number of participants who are known to each other participate in a research study and it is likely that they can identify each other from the responses provided (Tolich, 2004). The additional measures include the use of quotes without pseudonyms or other forms of labels to prevent linking of responses, and alteration of gender in some cases to ensure that gender cannot be used to identify participants. There were no apparent gender differences in responses, so this is not likely to affect understanding of the program's impacts.

Results

A total of 13 students participated in the study. All completed interviews, and nine of the participants also completed pre and post visual mapping activities. One child consented but subsequently left the school and did not participate in the study activities.

As detailed below, the predominant theme that emerged from this study was that the Survive and Thrive program was successful in changing children's understanding of their role in a bushfire risk environment. This incorporated a sense of place, actions of self and others, and strategies for managing emotional responses to danger. The occurrence of the fires during the Christmas holiday period provided a unique opportunity to compare children's reports of how they would feel and act if there was a bushfire with what actually happened. The results are presented using

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the key questions asked of children in terms of their knowledge, actions, and feelings about bushfires.

Who provides bushfire information and support?

At Time 1, children tended to name the dominant adults in the different settings as their primary sources of bushfire information and support: parents at home, teachers at school, CFA in Anglesea, and lifeguards (surf lifesavers) and grandparents in other settings (Figure 1). After participating in the Survive and Thrive program for over a year, they had a clearer sense of sources of reliable bushfire information. The adult roles in each setting were still evident, but children began to recognize that bushfire information was specialized information that not everyone shared, and so the lifeguards, pool staff, and the SES (State Emergency Service) were notably absent as perceived sources of bushfire information at Time 2 (Figure 2). Some children now felt that their parents had limited knowledge of bushfires and bushfire safety.

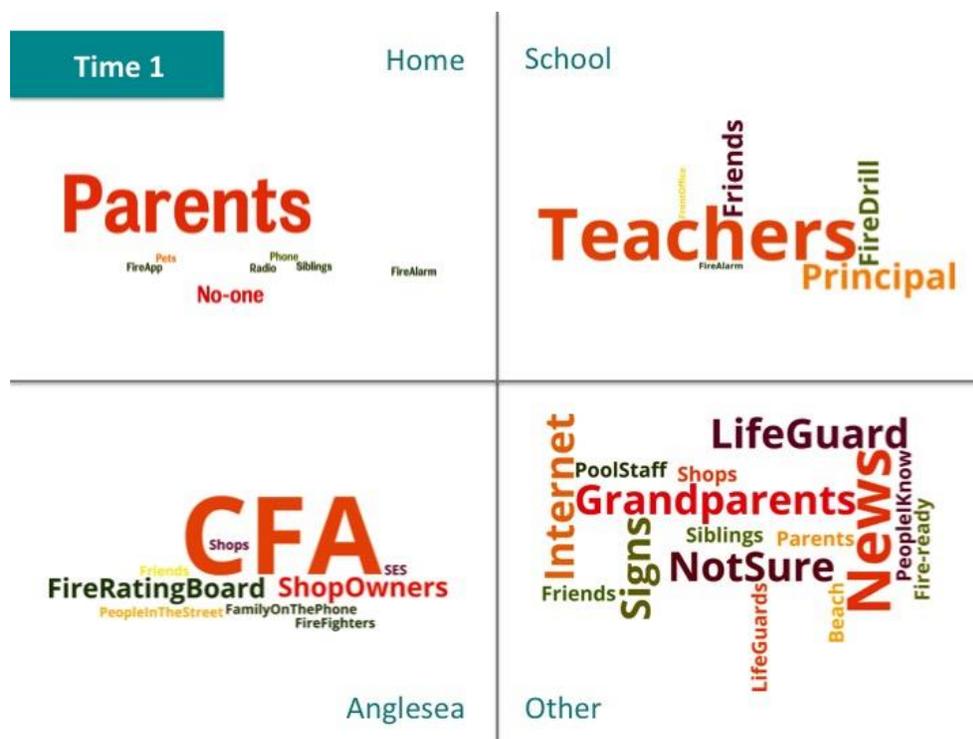


Figure 1: Who provides you with bushfire information and support? – Time 1

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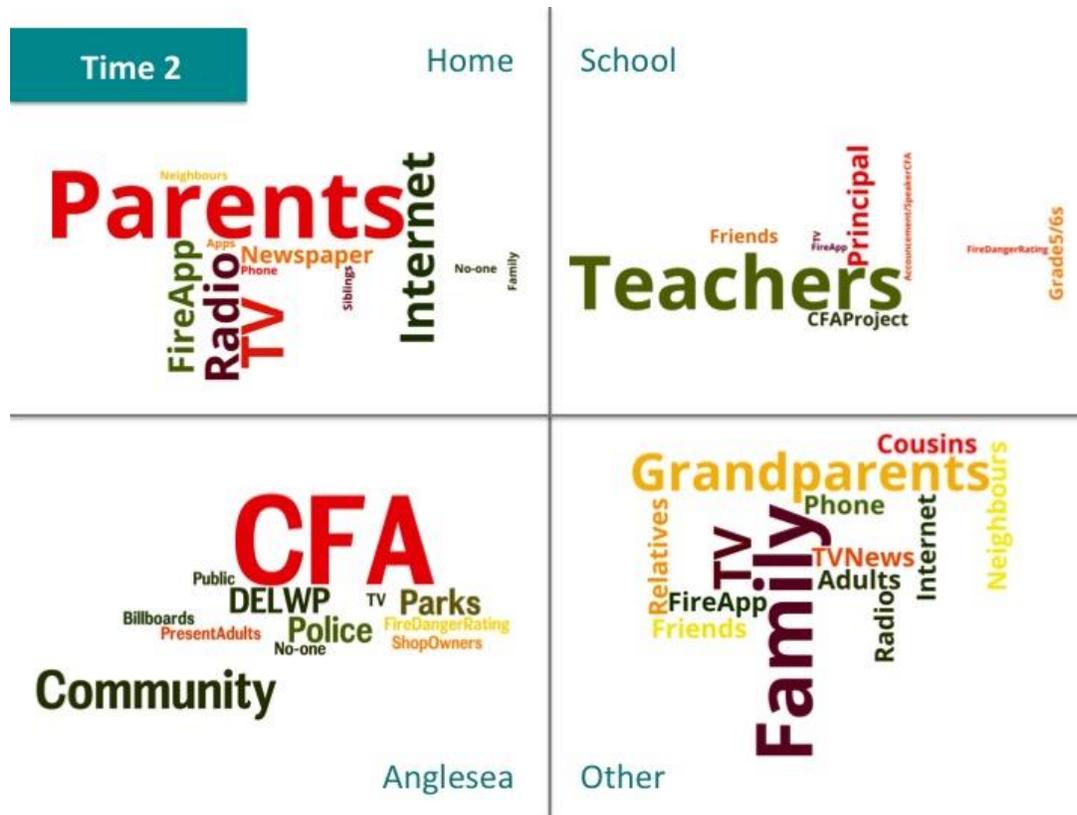


Figure 2: Who provides you with bushfire information and support? – Time 2

Children were also more knowledgeable about additional sources of information following participation in the Survive and Thrive program. Some children initially listed sources such as the news, the internet, and signs such as the CFA Fire Rating sign. Some were more specific at follow-up, referring, for example, to the FireReady app,³ which they could access on their parents’ phones (as the children did not have their own phones):

You can turn notifications on and it will tell you where there’s a fire or if there’s an accident nearby that can cause a fire. You choose where you are ... and then it would say, “best to leave now” or it would say, “pack your stuff and get ready,” because it senses on the map how far away you are.

³ The official Victorian government online application for and access to community information and warnings for all types of emergencies in Victoria. Since replaced by the VicEmergency app.

Probably the FireReady app or the BOM⁴ on the internet. Sometimes the CFA have it where it started. All you need to find out is the direction of the wind, the density of the fuel and leaves in the area and the weather. So, the moisture in the grass and the temperature, and you can pretty much just map out where it's going to go.

Children also had a clearer sense of the role of the CFA following involvement in the Survive and Thrive program, although there was confusion for some about whether or not CFA would go to every house to warn residents in the case of a fire. When children were asked at Time 1 who they could provide bushfire information and support to, many named family and friends, but the majority said “no-one” or “not sure” (Figure 3). At Time 2, as they explained in their interviews, they assumed most people would be aware of an approaching bushfire and that the teachers and older students at their school were also familiar with the program.

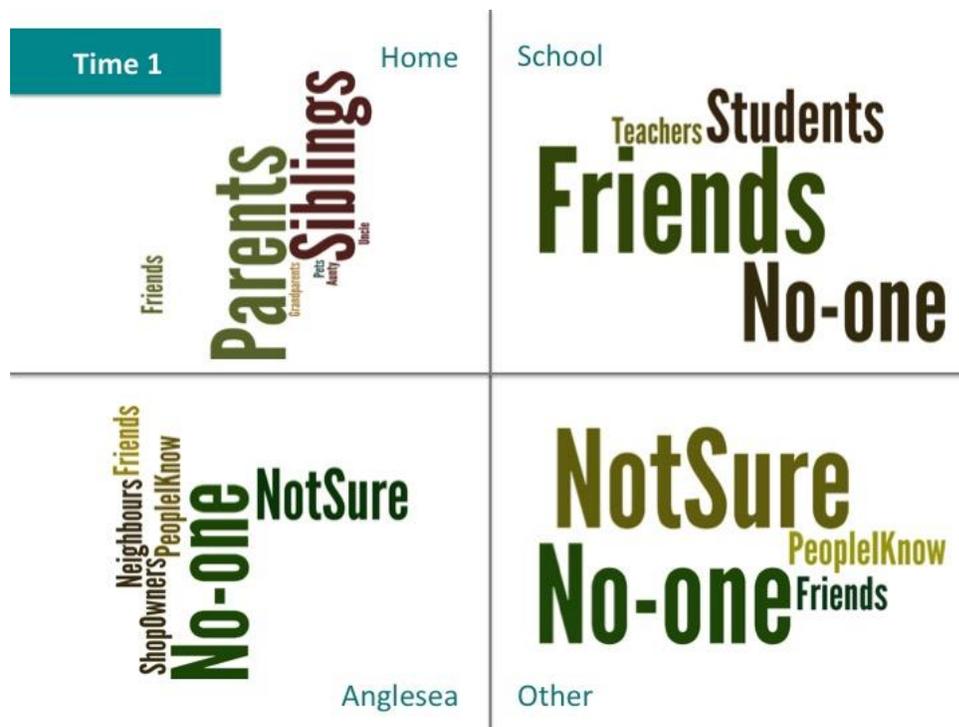


Figure 3: Who do you provide bushfire information and support to? – Time 1

⁴ Bureau of Meteorology website.



Figure 4: Who do you provide bushfire information and support to? – Time 2

I'm probably wasting time. They probably already know. Like what I said before about warning the family, it's wasting time. They can obviously smell smoke in the air and all that type of thing.

So while the children were less inclined to think that they would tell people a fire was approaching, they had more confidence in their ability to provide useful information about bushfires. This was evident in their responses at Time 2 (Figure 4) and was reinforced by the Survive and Thrive program presentations in which the students engaged parents, community members, and other school children in various activities to teach them about bushfire safety.

It felt really good to know that I can help people with what I know.

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Children also felt they could give useful information to younger children and teachers new to their school, and also to tourists.

With the juniors, if there was a fire, I have a buddy and her name's Molly and I don't think she probably understands the concept of fire yet. If there was a fire I would tell her just to be calm and stuff like that.

People who come down on holidays might not exactly have an idea of what happens in Anglesea or the fire dangers that can happen over the summer when it gets really hot. They might not know to evacuate or have any way of contacting anyone...You can help in any way you can by just letting them know.

This was confirmed when the fires did occur and one child was able to give a tourist information about what was happening:

I felt good that I was able to provide information because they weren't sure and they could have died.

However, one child didn't think she could provide anyone with bushfire information and support:

I don't know because I think if there was a fire, I don't think anyone would be listening to the children.

Children's confidence in their ability to provide useful information was reinforced by their sharing of knowledge with their families over the course of the program. Children were most likely to share their learnings in the program at home when their parents asked about what they did at school that day.

My mum and dad, at the table when we're eating, they'll say, "What have you learned at CFA?" And my brother, because he likes listening about it as well.

One child even described sharing what he learned with his cousins in Anglesea and Melbourne. Children spoke of increased preparedness activities at home, including having an emergency box with essential items ready.

Originally when we had a fire plan, we didn't really have a bag, and now we've got the bag, fire plan, and what to do. When the fire was heading towards Lorne [a nearby town], we knew more about it and what to do... I don't know what we've done before but we

knew “we've got to do this and that,” like clean up, wet the grass and things like that, clear the gutter out and be a lot smarter about it, know what to do.

For mum and dad, mum grew up in Queensland and there wasn't as much fire as there was down here because she lived in rainforest and tropical areas. I'd tell mum about it so she'd be mentally and physically prepared to go through a fire. Dad, he's lived here most of his life and he knows a lot about it already, but there were some things that he didn't quite know and I've told him things like that ... He didn't understand how fire will travel faster uphill instead of downhill. From here and Lorne there's heaps of valleys and hills and stuff, so it might take quite a while to get from there to Aireys if it was not a very windy day. He didn't understand that, but I told him that heat rises so it's faster and then he understood better. When it's coming downhill, it's trying to go up, but it's coming down as well.

This showed children's capacity to influence family knowledge and actions. In some cases, families were already prepared. Some children reported that their families still didn't have a fire plan. In others, this new knowledge translated into changed family preparedness activities.

How does the word “bushfire” make you feel?

The increased knowledge children gained from the Survive and Thrive program was an important factor in managing their feelings and emotional response to bushfires. When children were asked at Time 1 how the word “bushfire” makes them feel, the dominant responses were “scared” and “worried” in each location (Figure 5). At Time 2, children continued to associate feelings of fear and worry with the thought of bushfires (see Figure 6), but the interviews revealed that this was a rational understanding of how bushfires would be experienced in terms of the emotional impacts of a danger situation:

It's changed because I'd still be scared, I'd be rushed to try to get out to a safer place and would be focused because I know the Neighbourhood Safer Places after we did the CFA project, so I'd know where to try to get and I'd be focused on getting to a safe point.

Children still reported being nervous and scared about bushfires, but it was more contained at follow-up:

I wouldn't be as scared because I'd know more about what they do to stop the bushfires and how they keep us safe, but I'd still be a bit nervous because it is still an emergency.

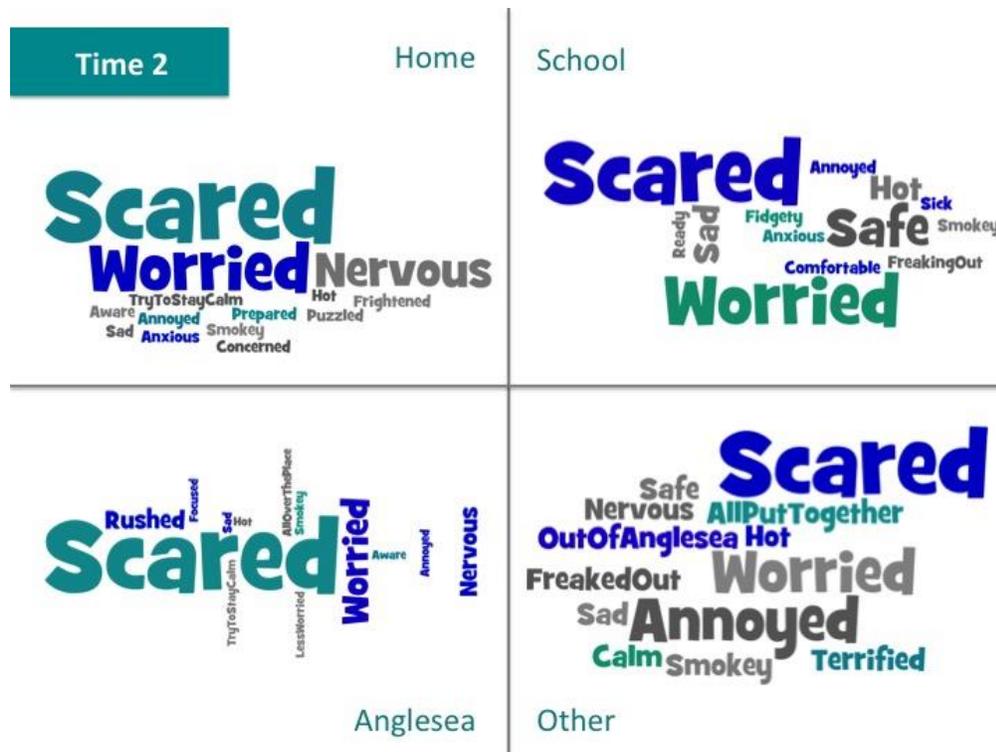


Figure 6: How does the word “bushfire” make you feel? – Time 2

All of the children recognized that their school had high levels of bushfire safety because it had been recently built to high fire safety standards, the layout of the surrounding landscape reduced risk, and the teachers were well informed because of the involvement of the school in the CFA Program. There was generally a sense of calm about being at school in the case of a fire, with students secure in the knowledge that the school is prepared and the students’ role is to follow instructions:

I think it's because if we were in the school we'd still be in their control so we'd listen to them and they know what to do in a fire.

It is a pretty fire safe building. If people had to evacuate, this would be one of the safest places to actually come.

I learned even more about the things around the school and what things keep us safe...We have the fire extinguishers and the fire blankets and the fire evacuation plan, how we're going to keep safe. I probably feel a bit safe, I guess.

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There was one exception, where one of the children had originally listed feeling safe at school but this was not present in the follow up. The child explained the difference:

I found out it's not as safe as you think because the fires are unpredictable and you don't know what they're going to do. It would be the same anywhere.

This suggests that the child retained the message about bushfire variability but less about understanding and predicting bushfire behavior.

Children often spoke of family as a significant factor in the way they would feel and act in response to a bushfire:

[At school] I'd feel safe, but because I'm not with the rest of my family, I'd feel a bit nervous and scared because I'm not sure if they were okay.

The students were very conscious of the allocated Neighbourhood Safer Places in Anglesea that they could go to if a fire occurred and they were not with their parents. At Time 2, they were all able to describe at least two Neighbourhood Safer Places in their local area. They also understood the features that made those places safe:

I think the beach is just a safe place to be if you were down there, but because there's the bush on the fencing of the beach it can jump over onto the sand if there are twigs there and the fire can jump over. I think that's the biggest worry about being down there. On the river, you've got the road next to it and on the other side there's bush but it's only light bush, it's not heavy and there's a big fat tree there, more green than easier to burn. There's not as much fuel on that side. Then you've got the caravan park, which is pretty cleared out. It wouldn't get as hot down there as it would at the beach.

A number of the children referred to the speed at which fires travel as reassurance that there is time to get away:

If there's a fire, it does take a while for it to move. Fires don't move as fast as a car; they don't go 100 kilometres per hour. You've got time to do things and that's one of the best things to know, that you've got time to get in and get out of town and away from the fire.

However, they did not necessarily take into account the likelihood of traffic on the main access road or in a smoky, chaotic environment. Children are often presumed to be egocentric, but their responses throughout the study demonstrated that they were very conscious of the needs of others, including people outside of their family:

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I'd have to calm myself down, and I might be with other people, so I'd have to try to help them be calm and we'd all try to get somewhere safe.

What would you say to someone to help them calm down?

"It's all right, we'll get through it. Just keep breathing, keep thinking good thoughts. We'll find a safe place."

This showed a sense of agency in terms of sharing their new knowledge and skills to help others.

What would you do if there was a bushfire?

The greatest shift in student responses from before and after the Survive and Thrive program was in their reports of how they would act if a bushfire occurred. At Time 1, many children were focused on warning others. Children's responses demonstrated care and concern for others, such as "warn others" and "warn neighbours," but also undirected energy suggestive of a panic response: "Go crazy" when at home, "Run, run, run home and warn people" when at school, and "Run to the beach like a headless chook" when in Anglesea (see Figures 7, 9, and 11). The children perceived adults as a source of information and support, but they felt responsible for contributing to peer and sibling support and caring for pets.



Figure 7: What would you do if there was a bushfire? – At home (Time 1)

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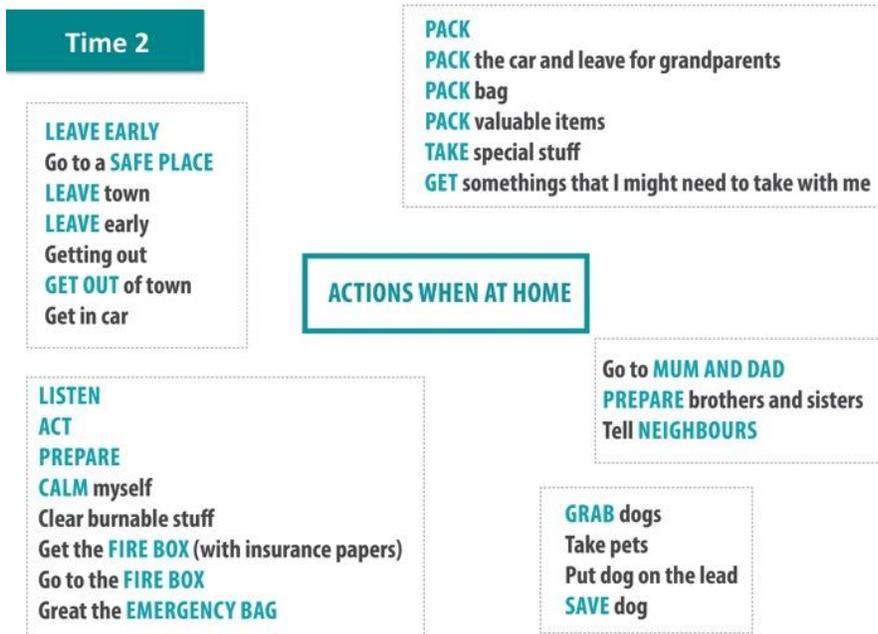


Figure 8: What would you do if there was a bushfire? – At home (Time 2)

Conversely, at Time 2 there was an overriding sense of order and calm in children’s reports of anticipated actions. Children described various preparedness tasks at home such as “Pack the car” and “Get the fire box,” and emotional self-regulation such as “Calm myself” (Figure 8). At school, they described listening and following teacher instructions (Figure 10), and in Anglesea, they described calm and focused actions such as “Keep calm,” “Listen to local authorities,” and “Check weather” (Figure 12).

These children explained why they changed their responses from Time 1 to Time 2 about how they would behave in a fire:

Just everything I've learnt about fire. That's pretty weird running with friends up to my house, which is the other side of Anglesea, but listening to instructions would be better.

I think I thought before I did the CFA that, I thought we could just go to the beach and it'd be that simple, but now I realize that you need the things in your emergency bag to help you if you had to stay on the beach for a couple of days. We would be prepared. Leave ... not stay at home in case the fire would come. Go to Neighbourhood Safe Place because there'd be support and help there.

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Help and support are not actually available at the Neighbourhood Safer Places, but these statements made it possible to identify misunderstandings and correct them within the Survive and Thrive program.

There was also a shift from responses at Time 1 that included “Fire Drill” (see Figure 9) and “tuck and roll” (see Figure 7), indicating a probable level of confusion between responding to a building fire and a bushfire. This appeared to be absent at Time 2.

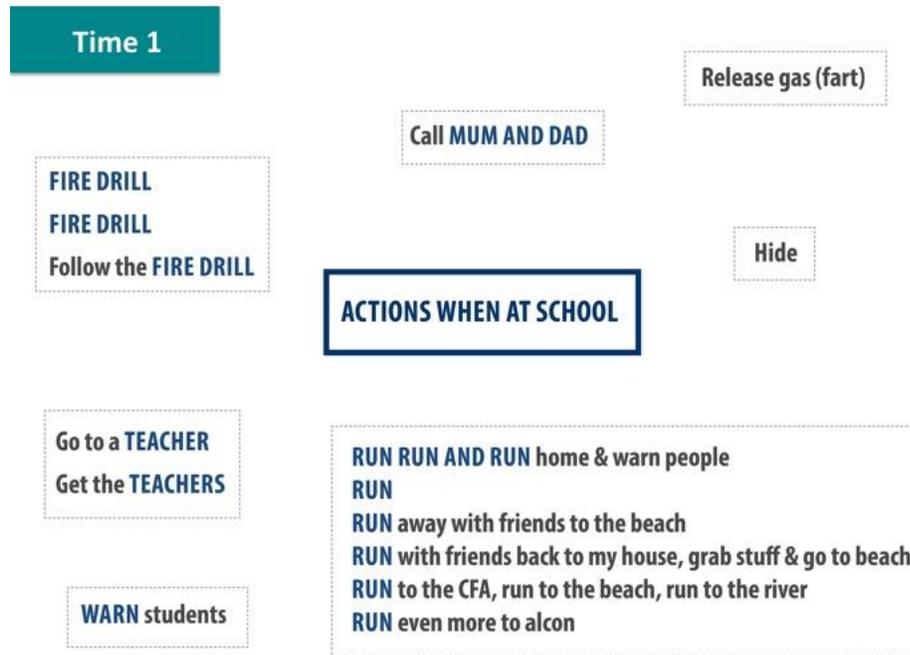


Figure 9: What would you do if there was a bushfire? – At school (Time 1)



Figure 10: What would you do if there was a bushfire? – At school (Time 2)

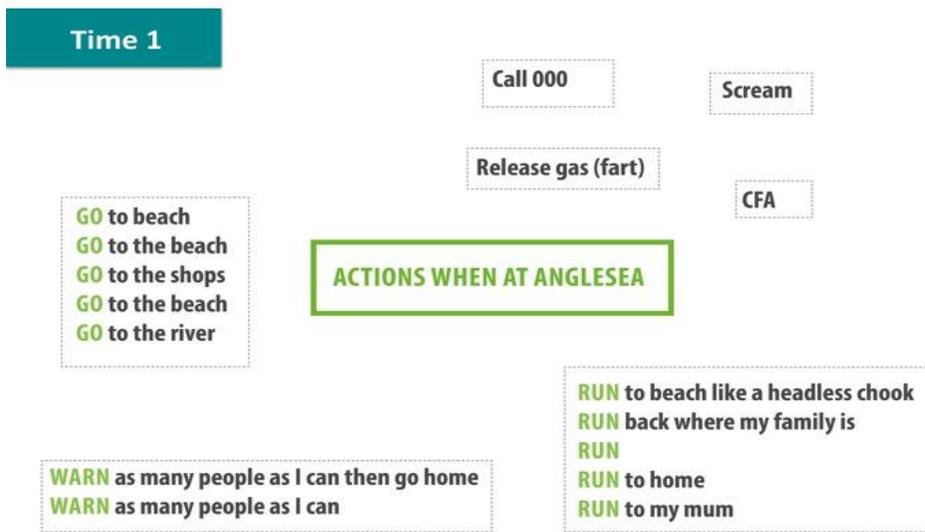


Figure 11: What would you do if there was a bushfire? – In Anglesea (Time 1)

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Figure 12: What would you do if there was a bushfire? – In Anglesea (Time 1)

The children’s accounts of their experiences of the actual bushfires over the school holiday period demonstrated that they were able to make a meaningful contribution and showed that they were able to respond calmly even when they had anticipated they would be scared and worried.

On Christmas Day there was a fire when we got home, because we were in Melbourne. Usually my parents wouldn't know what to do but they knew exactly what to do this time... Because of all the things I've told them, exactly what they need to pack... I told them some things and they thought it was a good idea and they did it, but once the fire wasn't coming, it was fine.

When the Lorne fire was, I was walking my dog and there was a ting⁵ on my phone because I had it with me. It said that there was a fire in Lorne and Wye River. I texted mum saying, “Have you checked your fire app?” She said no, and I said, “Well there’s a fire in Lorne so just explain to [everyone].” It was Christmas morning ... She hadn’t

⁵ A notification from the FireReady app.

checked her phone because she was really busy. We all have our own bags that have our clothes and a blanket for us all in it. She said to get everyone and we'll put them next to the door... Before I did the CFA, we had just some blankets and some clothes and mum had some money in there and she had a torch and stuff. Then after I did the CFA, she put radios and she wrote down the currency of the radio stations that she could use. She put the insurance papers in there and stuff like that, after I told her some of the good things to put in there.

This demonstrated the children's capacity to apply their knowledge in real life situations and to have the confidence to provide appropriate advice to their parents.

Experience of the Survive and Thrive program

Almost all of the children were extremely positive about their participation in the Survive and Thrive program and reported that they would recommend it to friends at other schools. The most important outcomes they nominated were that they now knew about how fires behave and what they should do. They recognized that they had learned life skills.

I'd say definitely do it, because it's fun and you actually learn stuff that you can use out of primary school, not just in primary school... If you learn the basics, you know stuff about fire. So, it's not an ongoing thing you have to do. You just learn in primary school and it will be there, knowledge for your life.

The exception was one child who commented:

To be honest, I'm not really good at CFA.

The child felt inadequate at completing the activities and learning the skills, but later in the interview, the same child provided detailed information about how environmental conditions impact the behavior of the fire and how these conditions can be monitored using environmental sensors (provided by the University of Melbourne). Some of the children planned to continue their involvement with CFA when they transition to secondary school through the Junior Fire Brigade.

Discussion

This study addresses a current gap in the disaster education literature (Johnson et al., 2014) by using a mixed method, qualitative research design to explore children's experiences of a disaster education program. The original premise for this research was that programs such as Survive and

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Thrive provide an opportunity to increase children's sense of agency and opportunities for citizenship in a disaster risk context. This premise was based on the assumption that the increased knowledge and skills would provide opportunities for children to contribute in a meaningful way to family and community preparedness, and would increase their own sense of safety and agency as a result (Mitchell et al., 2008; Peek, 2008). What emerged was slightly different, however. Studies of confidence and agency, particularly in children, can be complicated by children's unrealistic understanding of what will happen and what is required. For example, children who have never cooked may be very confident in their ability to cook a meal until they try to cook or learn what is involved. The initial visual mapping activity with children to assess their feelings and anticipated responses to a bushfire showed that they would be scared but felt they were responsible for warning others. This suggests that even though they didn't know who they would provide bushfire information and support to, they felt a high sense of agency and citizenship when it came to action. However, after participating in the Survive and Thrive program, they showed much greater insight into what would happen during a fire and how to behave safely. There was a noticeable shift from seeing all adults as holders of bushfire safety knowledge to recognition that this is specialist knowledge, some of which the children now share (Mitchell et al., 2008). There was also a shift from thinking that no one will know what is happening in a bushfire event to a clearer sense of different roles and planned actions. This suggests that the Survive and Thrive program successfully linked the children's understanding of disasters with their own civic roles within the surrounding systems of home, school, and community (Ronan & Towers, 2014).

As a result, the children in this study recognized the need to behave differently in different contexts, specifically to contribute to packing and leaving early when at home, to go to the Neighbourhood Safer Places when in Anglesea, and to sit quietly and respond to instructions when at school. This school response did not represent a reduction in agency to be a "passive victim" but was instead based on a considered appraisal of the safety of the school environment, the knowledge and capacity of their teachers, and their own contribution to a calm response. Their reporting of strategies for keeping calm also showed that the children understood the emotional impact of a dangerous situation and their own capacity to manage their emotions. Reduced fear and anxiety have previously been associated with disaster education program outcomes (Webb & Ronan, 2014). The children's reports of their actual responses to a real bushfire risk demonstrated that they were able to respond as well as or more competently than they had anticipated. This is a unique contribution to the disaster education literature, given the lack of pre and post studies that follow cohorts of participants into response and recovery from

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an actual disaster event (Johnson et al., 2014; Ronan et al., 2015). It adds to the emerging reports of child and youth citizenship in relation to family and community disaster response and recovery (Peek, 2008).

Importantly, this study repeated earlier findings that, following the bushfire education, the children involved continued to recognize the inherent danger in disaster events and understood the emotional impact, but felt better prepared and able to cope if one did occur (Ronan & Johnston, 2001; Ronan et al., 2008; Ronan et al., 2015).

These findings contribute to the developing literature on child disaster risk reduction. The main limitation of this study—the small sample size and a single school community setting—means that the findings cannot be generalized to other settings. This limitation is consistent with the majority of the disaster education literature (Johnson et al., 2014). However, the study findings do demonstrate the potential value of immersive programs between schools and emergency management agencies to improve the capacity of schools to manage emergency events, to increase children’s knowledge and competency in hazard situations, and to positively influence family actions. Increased hazard knowledge and family adjustments are most likely to occur when the school-based program is integrated with an emergency management focus (Ronan & Johnston, 2001). The delivery of the Survive and Thrive program reflects review recommendations that disaster education programs be integrated into core school curricula, providing graduated exposure to new material and refreshment of material previously learned (Ronan & Johnston, 2001; Ronan et al., 2015). The outcomes of this program were also likely to have been enhanced by the inclusion of hands-on experiential learning and the opportunity for the children to train others, enabling them to make a civic contribution for which they were justifiably proud (Peek, 2008; Ronan et al., 2015). In these times of global risk of increased disaster frequency and severity, children can contribute to disaster preparedness and recovery.

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