The role of schools in disaster settings: Learning from the 2010–2011 New Zealand earthquakes

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A R T I C L E   I N F O

A B S T R A C T

This article draws from detailed qualitative case studies of five schools as they responded to the devastating earthquakes in Christchurch, New Zealand throughout 2010 and 2011. Three key themes emerged from a cross-case analysis. The first theme is the place of the school in a community's disaster response and recovery. The second is the leadership role of principals and teachers in disaster response and recovery. The final theme is how schools support the emotional recovery of staff and students. The article concludes with recommendations for wider recognition of the potential that schools hold for disaster response and recovery.

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1. Background

On September 4, 2010, a 7.1 magnitude earthquake hit the Canterbury region of New Zealand causing widespread damage to the city of Christchurch and surrounding districts. The earthquake was to be followed by over 12,000 aftershocks over the next three years, including several over magnitude 6. The most destructive was on February 22, 2011, which was centred closer to the city of Christchurch and with an upthrust of twice the force of gravity. It demolished the city's business district, killing 185 people and injuring thousands more (Canterbury Earthquakes Royal Commission, 2012). All educational institutions, from early childhood centres to universities, were closed for several weeks following both the two major earthquakes of September 2010 and February 2011 (Education Review Office, 2013). As the region came to terms with the death and destruction, getting schools up and running again became a government priority. This meant that schools, many of which were already being used as temporary community response centres, were thrust into significant disaster recovery roles for which they were largely unprepared. Principals and teachers took up the challenge despite the loss or damage they faced in their own lives. This article draws on qualitative research funded by UNESCO and the University of Auckland in which five primary schools were followed over a period 18–24 months from early 2012. The study provides an insight into how schools undertook their disaster response and recovery roles. Three themes from the cross-case analysis of the five schools are shared in this article. These themes explore the place of the school as a community hub for disaster response, the role of principals and teachers in disaster response and recovery, and the centrality of the school in supporting the emotional recovery of staff, students and their families. The lessons learned contribute to a growing understanding of the role of schools in disaster response and recovery.

While large-scale disasters have often been seen as the domain of developing countries or generally located in the Asia-Pacific region (Ferris and Petz, 2012; Smawfield, 2013), climate change has increased the likelihood of extreme weather events across the world, impacting on all continents and including highly developed nations (Back et al., 2009; Gibbs et al., 2013; Lee, 2013). The Brookings Institution, for example, reported on the costly disasters of 2011 (earthquakes in New Zealand, floods in Australia, the triple earthquake/tsunami/nuclear disaster in Japan and a series of severe weather-related events in the US). They titled their report as *The year that shook the rich* (Ferris and Petz, 2012) signalling that the economic status of countries does not provide immunity from disaster.

Definitions of disasters abound. Some definitions focus on the causes of disasters. Ferris and Petz (2012, p. XIX) state that disasters are: "... the consequences of events triggered by natural hazards that overwhelm local response capacity and seriously affect the social and economic development of a region." Other

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definitions focus more on the effects of the disaster. Bonanno et al. (2010, p. 5) state that: "Disasters cause harm, destroy property, and disrupt survivors' lives in myriad ways." Common themes across definitions are the suddenness, unexpectedness, lack of preparedness, size of the event and ensuing damage, inability of existing systems to cope, large-scale death or dislocation, and often lack of immediate access to food, water, shelter and medical aid (Cahill et al., 2010; Ferris and Petz, 2012; Ferris et al., 2013; Smawfield, 2013; Winkworth, 2007). A feature of disasters is also the way in which they change the lives of those most affected, both individually and collectively. Winkworth (2007) talks of "… the sense that a group of people make of the event – a shared identity that they have, together, been affected by a major catastrophe" (p. 17).

The disaster that is the focus of this article is a series of earthquakes. What differentiates earthquakes from many other disasters caused by natural hazards is that there is no warning, as there would be with a storm, for example (Ferris, 2010). Although in an earthquake-prone country, it had been many years since Canterbury had experienced serious damage and with the known major fault lines hundreds of kilometres away, the inhabitants were not attuned to large earthquakes as a possibility (Canterbury Earthquakes Royal Commission, 2012).

An earthquake is also not a single event but rather one or more major jolts followed by aftershocks decreasing in magnitude over several years but with the constant possibility of another major tremor. In Canterbury, there were five major earthquakes over a period of sixteen months (September 2010, December 2010, February, 2011, June 2011 and December 2011) (Canterbury Earthquakes Royal Commission, 2012). Aftershocks have continued into 2014. The on-going nature and unpredictability of earthquake aftershocks increases the likelihood of further damage and keeps people in states of hyper-alertness or anxiety, which are not psychologically healthy for prolonged periods (Lazarus et al., 2003b). The other factor that makes earthquakes different is that there is no clearly defined endpoint. In the case of the Canterbury earthquakes, this made long term decision making very difficult. Insurance claims and rebuilding programmes have been delayed increasing anxiety and dislocation.

The longevity of the earthquake sequence and the strength of the vertical thrust, make the Canterbury earthquakes unusual (Canterbury Earthquakes Royal Commission, 2012). Another unusual factor was the prevalence of liquefaction following each major jolt (sand, silt and sludge, often mixed with sewage from broken pipes, forced up through cracks in the ground by the force of the earthquake, which spreads quickly and re-solidifies) (Canterbury Earthquakes Royal Commission, 2012). These factors sit alongside the huge physical, social, emotional and psychological toll that any major disaster takes on its victims. It was in this context that the research described in this article was undertaken.

2. Literature review

The literature on the role of schools in disaster settings can be grouped into three categories.[1] First, there is the largest body of literature which focuses on the role of schools in disaster risk reduction and readiness. Much of this literature is instructive, in that it tells schools what they *should* do, although there are also descriptive case studies of what schools are doing. Second, there is a much smaller body of literature that describes the role of schools in disaster response situations. This literature consists mainly of case studies and narratives of how schools have coped with disasters that have hit them or their communities. The final set of literature is the smallest and focuses on the school's role in disaster recovery. There is, however, a large related body of literature from

the field of psychology, which deals with trauma-related symptoms and how schools can support students' psychological recovery. To keep the review relevant to this article, only the disaster response and recovery literature is discussed here.

2.1. Schools and disaster response

As schools are located in centres of population, large and small, a disaster affecting a community will impact on local schools. Not only might schools be affected by a natural disaster along with the rest of the community, they are now the site of school-centred tragedies, such as shootings or bombings. US school psychologists, Lazarus et al. (2003a) have written extensively on how schools can prepare to respond to different crises. They note that children look to significant adults for guidance on how to respond to a crisis, during and after the event. A calm approach in a stable environment can help children adjust and even "transform a frightening event into a learning experience" (p. 1).

Much of the literature in the school disaster response category features descriptive accounts of how schools coped with unexpected disasters. In 2008, for example, a group of New Zealand school students and their instructor were swept away and drowned in a flooded river. The principal needed to deal with multiple priorities. Details of what happened came though in a haphazard and fragmented way. He had to liaise with police, families, media, the Ministry of Education and his own staff. He needed to draw on his skills as a leader and the trust, respect and relationships that he had already established to bring his school through this tragic time (Tarrant, 2011a,b). Similarly, school psychologists in Israel, following suicide bombings in 1996, needed set up an information hotline, accompany victim's families to the morgue, liaise with schools where students or staff might be related to the victims in some way and help teachers plan how to debrief the situation when students returned to school (Stein, 1997).

Many vivid accounts have come out of the 2011 triple disaster in Japan, which hit on a school day. As the Japanese are used to earthquakes and their buildings are built to relevant specifications, despite the size of the earthquake off the coast of Japan on March 11, 2011 (magnitude 9), there were no reported school fatalities that were related to the earthquake (Parmenter, 2012). The tsunami that followed, however, was to test school leaders as never before. They needed to decide whether to evacuate to the highest level of their building, to go to an evacuation centre, or to leave the school and go to higher ground. In most cases, they made life-saving decisions. Many of the 500 children who died in the tsunami had already gone, or were on their way, home from school. Parmenter (2012) describes the teacher's role in the following days with those who survived: "Teachers looked after cold, hungry, frightened children in schools where there was no food, no electricity, no heating, and no water until family members came to get them" (p. 10).

Other accounts tell similar stories. A teacher at Ogatsu Primary School tells of how students responded well to the earthquake, taking refuge under their desks and later assembling in the schoolyard. The tsunami alarm then sounded and the decision was made to head for the shrine on the hills behind the school. From there they sheltered in a waste disposal plant using cardboard to make beds on the floor. They encouraged the children to sing songs to keep their spirits up. The next day they found their way down the hill to find their town completely destroyed (Ema, 2013). At Ishinomaki Special Needs School, staff needed to remain at the school to look after students who were unable to return home, as well as members of the local community who were dislocated by the tsunami. They were even asked to look after twenty frail elderly people whose beds in the local hospital were needed for emergency patients. All this in freezing temperatures with limited

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[1] An expanded literature review can be found in Mutch (2014).

food and fuel (The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT), 2012). Matsuiwa Junior High School became a temporary shelter on the first night of the disaster but without proper facilities evacuees were moved to other sites in the following days. Despite the school being in a state of disrepair with intermittent electricity it was quickly reopened in order to get children back into regular routines. The gym was used as a community support centre and temporary housing was built on the school grounds (Japan Society, 2011).

2.2. Schools and disaster recovery

School recovery is an on-going process. Once the physical recovery, in which buildings and grounds are repaired or rebuilt, or alternative sites or modes of learning are established, returning to a sense of normality can begin. Strategies and resources also need to be in place for the social, emotional and psychological recovery of staff and students as schools return to the purpose of teaching and learning.

Following the 2008 Sichuan earthquake in China, schooling was disrupted for 2.5 million children (Zhong, 2013). Access to schooling needed to be prioritised. Students facing examinations at the end of their primary or secondary schooling were the first priorities and were sent to neighbouring provinces or housed in prefabricated classrooms or tents. Vulnerable children were another priority, especially the 650 children who were orphaned by the tragedy. Child Friendly Spaces were set up in camps or temporary shelters to provide child protection and psychological support for dislocated communities. These spaces provided day care for young children, informal education for school-aged children, life skills training for adolescents and support for parents (Zhong, 2013).

A priority is supporting the emotional and psychological recovery of school personnel. Firstly, it is important to identify children and young people who are most at risk and secure appropriate support or interventions for them. Disasters can have serious long term effects children's health and well-being (Australian Psychological Society, 2013; Bonanno et al., 2010; Brock and Jimerson, 2013; Norris et al., 2002) but the severity of their reactions will often depend on factors such as exposure to the event, the level of physical destruction, injuries, loss or dislocation and pre-existing risks, such as previous traumatic experiences or mental illness (Bonanno et al., 2010; Brock and Jimerson, 2013; Lazarus et al., 2003a,b).

Many children may experience some of the following symptoms of distress and anxiety but if these are extreme or prolonged, specialist help is recommended. Very young children may experience bedwetting, clinginess, thumb sucking, sleep disturbances, fear of the dark or loud noises, or withdrawal from friends and routines. School-aged children might also become irritable or aggressive, not want to go to school, display poor concentration or loss of interest in friends or activities. Adolescents might display sleeping or eating disturbances, learning problems, physical complaints, increased aggressiveness or poor behaviour (Australian Psychological Society, 2013; Lazarus et al., 2003a,b; National Association of School Psychologists, 2008). The majority of children returning to school will display symptoms for the first few months but most will recover within a year or two (Australian Psychological Society, 2013; Bonanno et al., 2010; La Greca and Silverman, 2009).

Secondly, there is a need to provide time for children who are not severely impacted to process the events but without dwelling too much on the aspects they find distressing. Opportunities for talking to a caring and trusted adult, finding support from their peers, expressing their feelings through arts-based activities and maintaining normal routines are all suggested ways that schools can support traumatised children's re-introduction into regular school life (Cahill et al., 2010; Gibbs et al., 2013; Prinstein et al., 1996; National Association of School Psychologists, 2008).

Thirdly, school staff should not be forgotten. They also need to discuss their feelings and to share their experiences. They need to know and look for the warning signs that their colleagues might not be coping and make support available for them, such as time off or access to counselling (Lazarus et al., 2003a,b).

In conclusion, there is a growing body of literature on the role of schools in disaster settings, especially in the field of disaster risk reduction. However, there is little literature that draws together what has been learned from the role of schools in disaster response and recovery, although there are vivid accounts arising from recent disasters. There is also much to be learned from psychology in terms of supporting school personnel through post-disaster recovery. There is also a lack of a comprehensive high level approach that integrates school building design and construction and the inclusion of schools into national and local disaster planning (Back et al., 2009; Smawfield, 2013; Wisner, 2006).

3. Methodology

Following the Canterbury earthquakes, a seeding grant was received from UNESCO to pilot a project in which schools could record their earthquake stories. Research in disaster settings suggests 12–24 months after the onset of an ongoing disaster event to be an optimum time to start to make sense of the events (Bornemisza et al., 2010). The project aimed to be facilitative and participatory. Schools could choose to tell their stories through whichever media they wished with the lead researcher acting as project manager. The schools would receive a completed product that they could keep as a record and share with their communities. In return, UNESCO and Archives New Zealand would get edited case studies of the schools' stories and the researcher would get access to the raw data in order to conduct a cross-case analysis and share the findings more widely.

Because of the nature of the undertaking, a sensitive, contextual and ethical approach was needed. The initial concept was shared with Canterbury principals prior to the researcher's university granting ethical clearance. The pilot study was undertaken in one school and this confirmed and refined the approach. Important lessons from the pilot study included the importance of (a) taking time to build a trusting relationship between the school and the research team; (b) using experienced researchers who could adapt to the nuances of each situation and (c) having two researchers working in tandem so that while one facilitated, the other could act as an "intensity thermometer" to protect the emotional safety of both the participants and the researchers.

Further funding was received from the lead researcher's university and four more schools joined the project. The schools were attracted by the level of autonomy that they could have over research design and dissemination mode. Participants varied from school to school but were often the principal, senior leaders, teachers, school support staff, students, parents and other family members. Data gathering methods included individual and group interviews, which were video-recorded, audio-recorded or recorded in note form. There were also arts-based activities with students. Other data included photographs, school documents and electronic media, such as school websites, plus children's stories and drawings created following the earthquakes. These were supplemented by local and national media reports, research findings, such as the Education Review Office study (2013) and technical reports on the earthquakes, such as the Canterbury Earthquake Royal Commission documents (2012). The end products included an illustrated book, a video documentary and a community mosaic.[2] For the cross-case analysis, the data were

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[2] The UNESCO school projects are described in Mutch (2013a).

analysed in a constant comparative manner (Mutch, 2013b). This meant that each data source from each school was independently analysed for codes, categories, concepts and themes. These were then compared and contrasted vertically (within each case) and horizontally (across the cases). For this article, three themes from the horizontal cross-case analysis are selected for further discussion.

4. Findings

Three overarching themes emerged from a cross-case analysis of the five schools, regardless of their geographical location, the socio-economic status of their communities or their earthquake experiences. The first theme is the role the schools played in their communities during and after the major earthquakes. The second theme revolves around the crisis leadership roles played by principals and teachers, especially during the February earthquake, and in the school community's longer-term recovery. The final theme is how schools undertook the psycho-social role of supporting the emotional recovery of staff, students and families.

4.1. The role of schools as community hubs in disaster response and recovery

The September 2010 earthquake was centred 40 km to the west of Christchurch city. It hit at 4.35 in the morning when most people were in bed. Many injuries but no deaths occurred. However, the earthquake's size and shallow depth caused major damage to regional infrastructure (roads, rail, electricity, water supply and sewage) and to buildings in and around the city (Canterbury Earthquakes Royal Commission, 2012). Many people were displaced. Undamaged schools, especially those with large halls, kitchen and bathroom facilities, became evacuation shelters until people could be re-housed or felt safe enough to go home.

> That [September earthquake] happened overnight and there wasn't anyone on site but there was a lot of damage in our community. We were set up as a Civil Defence base, so for the first week and a half there were families from not only our community but the other schools as well coming here to receive support from Civil Defence. There was an overnight area in our hall where people stayed so we were getting a good picture of the needs of our community... with their homes... how much damage they did or didn't have and how frightened the children were. (Principal, School B)

Schools across the region were closed for several weeks as they were inspected for safety, repaired or relocated. Despite the extent of the damage, liquefaction and flooding, many people were buoyant, in that their worst fears had come to pass but they had survived. While life was chaotic for a time and large aftershocks disrupted people's lives, the disaster response machinery moved into place, aid flooded in from regional, national and international sources and a hopeful future was envisaged.

> We've had so much support from agencies – Red Cross, Presbyterian Support ... other schools around New Zealand. We were given funding. Even just getting e-mails from other principals associations – they really helped. They raised a lot of money. We used it for school uniforms, for camps, for families... (Principal, School B)

Before the task of recovery and rebuilding could begin, a second major earthquake struck. Officially an aftershock of the original sequence, the epicentre was 5 km to the south-east of the city near surrounding hills (GeoNet, 2014). It was 12.51 pm on a summer afternoon. Many people were on their lunch break. Some

secondary school students had a half day off as their teachers attended a union meeting. Most primary and early childhood students were eating lunch in their classrooms or were playing outside.

> I had no idea. I was so surprised. My friends were frightened because we didn't think it would happen again. Things were shaking about. Things were falling down. Windows were smashing. Things were spread across the floor. (Student 4, School A)

> I felt the floor come up under me and immediately I just dived under my desk and I had my head right in the corner near the wall and I closed my eyes very tightly and from then on I have a memory block and I don't remember anything else except a vague sort of sound and then silence but then hearing people being very stressed and alarmed and upset. (School office administrator, School C)

Children were well drilled after the September earthquake and they got under their desks or went to the evacuation place on the school field. No child in a primary school or early childhood centre was killed although there were some injuries (Education Review Office, 2013). Teachers checked that children were accounted for and then comforted them until they were collected. Principals and teachers waited until late that night until every child had somewhere to go before they could focus on their own families and checking the state of their homes.

> The school was phenomenal. The children streamed out of the classrooms and down onto the field. The teachers were incredible. It was very prompt and calm. (Parent, School A)

> Teachers were shaky. They were quite nervous. There was a lot of pressure on them to keep children safe. (Student, School A)

Many more schools were damaged and those awaiting repairs from September often sustained further damage. Again schools were inspected and temporarily repaired. Where they were unsafe, alternative arrangements were made. Schools relocated, put up tents, shared sites, worked in shifts or set up community learning hubs. More homes were damaged and families displaced. Over 10,000 children left their schools and attended schools in other parts of the region or in other centres around the country (Education Review Office, 2013).

> [When school resumed] we just made ourselves out there. We had a coffee morning straight away for the parents. We had lots of notices around the school saying, "Kia kaha [stand tall], we're strong, we can work through this together." And we kept referring to this as we welcomed the kids back. Half of them didn't come back, of course, because some of them had shifted away. Some of them were too scared to come back. Some parents were too scared to let their children come back so there were a whole lot of different reasons why we didn't have our normal cohort. (Principal, School D)

Prior to schools re-opening, they again became community hubs along with community centres, sports clubs and *marae* (Māori community centres). Residents came to sleep in the school hall or in tents in the school grounds, get water from the water trucks, use the portable toilets, get hot food, or get information from the various agencies that located themselves there. Schools reported that the relationship with their communities had strengthened. Long after their formal use as drop-in centres, families and community members continued to visit their local school for companionship, emotional support and advice.

They started caring more. They feel cared for; they start helping others. I've got a whole lot of people who would've actually come into the school offering to help other people in our community – people who they felt needed help. To me, that's the synergy of really strong relationships in a community. (Principal, School D)

Through all of this time, principals and teachers came to school and put their students first, despite their own personal tragedies, loss of their homes and possessions, dislocation and fragile emotional states.

We've had wobbly teachers as well. I've just been so amazed with some teachers in particular whose homes were badly damaged in town and they were offered discretionary leave to sort out their own lives but all of them wanted to be here for the children and when I asked them (or pleaded with them)—they said, "We deal with that outside of school hours. This is a fantastic distraction for us. We want to be here for our children, for our classes." I've just had so much admiration for the teachers throughout the whole process. (Principal, School B)

4.2. The role of principals and teachers in disaster response and recovery

The September earthquake gave principals and teachers some understanding of how to lead a school through a community disaster. They had time to prepare for how they would support their students when they returned to school. The Ministry of Education and other organisations, such as the Skylight Trust, provided materials and support on how to deal with trauma and loss. Schools updated their emergency response plans, communication strategies, child collection policies, first aid kits and disaster supplies.

From September 2010, the things we had to consider were: Is our building safe? Are our children going to be safe? Are the staff going to be safe? (Principal, School B)

February was a different matter. There was no time to prepare. Decisions needed to be made immediately and delivered confidently.

I put on my principal's smile. Parents arrived and were standing outside. I realised then that I had an audience and my response needed to be calm and instantaneous. I had to look like I was in control. (Principal, School A)

[The February quake] was a bit different because it happened here during the day. I was just walking out into the playground and BANG! So the response from me was: "Right, what do we need to do here? We need to make sure the children know where to go and to go there immediately and not back to their rooms." So we set off the alarm and the children were assembled in our assembly area and within about five minutes I had an assurance from every teacher that everyone who needed to be there was there and was safe. (Principal, School B)

In the days that followed they needed to keep in touch with families of staff and students, especially in cases of death or injury. They needed to communicate the latest information coming from the Ministry of Education or Civil Defence. They needed to liaise with the Earthquake Commission, engineers and tradespeople about school repairs.

The school was closed for two weeks and in that time, being a principal, I thought, "Great opportunity to get back into school"... but people were saying, "We've been told not to come into school

and you shouldn't either". So that was a difficult thing for principals because we wanted to be in school and we wanted to get things back up and running, but we weren't permitted back in the building. (Principal, School D)

Before school opened, schools held teacher-only days where teachers were encouraged to share their own stories and then decide on a whole school approach when the students returned. When school reopened, they needed to judge how ready children were to return to their learning.

The Ministry of Education had a support team come in and meet with the staff about two days before we opened and we talked about the kinds of things we could do to support the children. (Principal, School C)

4.3. The role of schools in supporting emotional recovery of staff, students and families

Principals were thrown into a role that they were unprepared for. They worked long hours with little respite. One principal noted that principals needed to look after themselves so they could look after their schools:

You need some calm time to stop, to talk to yourself about what has happened. To work out what you want to say and how you are going to say it. You are going to have to explain to children what will happen next and how things are going to get fixed. You need to find some time for yourself to reflect on everything. (Principal, School B)

All principals talked about the fragility of their staff. Teachers and support staff were dealing with their own insurance, rebuilding, health and family issues. Yet through all this they put their classes first.

I had a teacher with her house on the hill in Sumner [an area badly damaged in February]. I had a teacher who was in the red zone [an area cordoned off from the public] who for a good part of a year didn't have a toilet [as sewers were damaged, streets were provided with shared portable toilets] and in the end didn't have a house. She had to leave. That starts to wear down the staff so we knew we had to look after each other. We really had to look out for each other ... be prepared, watch the signs – "This teacher is not going to be at school tomorrow. I can just tell; she's looking shaky". (Principal, School D)

Schools needed to tune into children's physical and emotional states when they returned to school and create "a culture of care."

Obviously we kept on feeding kids, we've always done that to a certain extent but that became more evident. There were kids without lunches, there were kids without breakfast; we just fed them as the need arose. Kids were really tired so we would put cushions in the back of the room for them to sleep. (Principal, School D)

Schools were advised by the Ministry of Education and school psychologists to allow some time to reflect on the events and then to return to normal routines as soon as possible.

We talked about all the feelings and ideas, what was happening for different people so they could know what was happening. We did these things for the first few days and then it became apparent the children needed to get back into some kind of routine. Children were tired and grumpy, parents were anxious. We felt it was time to talk about something else. (Principal, School C)

After the initial two weeks after each quake we tried to keep things as normal as possible – reading, writing, maths, school trips… we tried to keep going as normal as possible – that was the advice we had. (Principal, School B)

Schools took on a much greater pastoral care role. They looked after the needs of families and well as their students.

Teachers, that's the interesting part, straight after February, teachers rallied round. Teachers are great. I can't say enough about how much strength, how much integrity, how much they would go the extra mile to drop kids off, to look after kids in their classrooms after school, to buy them special treats, take them to McDonalds, all those sorts of things… to find clothes for them, to find a pram for a mother who didn't have a pram to wheel her baby to school…. (Principal, School D)

5. Discussion

5.1. The role of schools in community response and recovery

Drabek (1986) identified a common sequence of community response following a disaster. The first phase is shock and disorganisation. This is followed by an altruistic or heroic phase when individuals put their lives at risk to help others. This leads to a period of high morale, often called the "honeymoon period" when communities are thankful to have survived and are optimistic for the future. This phase lasts until governments, aid agencies and recovery systems are not seen to not be living up to expectations. Communities become dispirited; individuals become depressed. Eventually, in Drabek's model, reconstruction begins and a renewed sense of hope begins to emerge.

The school stories in this study echo this sequence. Principals, teachers and students felt shock at what happened, especially in February, which was not expected given what they had already experienced in the previous September. Post-disaster, principals and teachers heroically put their students at the centre of their decision-making. This was confirmed by reports from the Education Review Office (ERO), New Zealand's school evaluation agency, which collected data on school responses to the earthquakes. "People became more important than procedures. Leaders in schools and early childhood centres became role models for others. If the leaders stayed calm, then children, staff and parents were more likely to remain safe and calm" (ERO, 2013, p. 1). Similarly, stories from Japan tell of teachers' compassion and stoicism (Japan Society, 2011; MEXT, 2012).

As the aftershocks, damage assessment, insurance wrangles, recovery and rebuilding dragged on, people became frustrated. Schools were centres of stability and normality. Parents found refuge in their local schools. They were welcomed and supported. ERO (2013) notes, "The school was seen as a vital hub in the community for not only the families attending the school, but also the wider community. Giving to others and connecting with the community was a very positive outcome…"(p. 2). Researchers in Japan also noted the importance of the school as centre for the community where people could shelter, share information, provide support for each other and bring a sense of calm (Japan Society, 2011).

In order to further understand the significance of the school's role in community disaster response and recovery, it is useful to turn to the work of Rob Gordon. Gordon, a community psychologist, observed patterns of community response to bushfires in Australia over 20 years (see Gordon, 2004a,b, 2007). He explains community response and recovery as a process of debonding and rebonding. Prior to a disaster, communities are webs of social structures and interactions. There are relatively predictable patterns of relationships. In the immediate aftermath of a disaster, the focus shifts to survival. Pre-existing social relationships and patterns are disrupted. Thus, the disaster causes social *debonding*. As the immediate event subsides, people begin to organise themselves in order to cope with the aftermath. A new emergent and context-related social fabric emerges with little similarity to previous hierarchies or structures. This is a stage of *fusion* or *hyperbonding*, in which acts of heroism, altruism and togetherness form new bonds. As the disaster situation moves from response to recovery, tensions lead to perceived inequities. The differences between groups are exacerbated and *cleavage* planes develop. In order to minimise cleavage and promote community cohesion, social infrastructures need to be re-established through *rebonding* opportunities.

The study reported on here charts the role of schools through community debonding, hyperbonding and rebonding. The School D principal provides a concrete example of debonding. She tells of stopping looters who were running through the school grounds after taking goods from a nearby shopping centre in February. "Stop this," she said, "the children have seen enough." She reported that not only did the offenders take note of what she said but they came back to visit when the school later re-opened because it was a place where they felt that someone cared about them.

An example of fusion or hyperbonding is provided by School E. A hundred of their children, plus teachers and parent helpers were at the local swimming complex when the February earthquake hit. The heroics of the teachers and parents as they rescued and calmed the children, then guided them back to school over damaged roads and bridges and through liquefaction and flooding led to hyperbonding. Three years later, the teachers, students and parents feel they have a special bond. The parents regularly drop into the school and the students return to visit those teachers even if they have moved schools.

In this state of fusion, members identify with each other because they share the same experience; they feel strong emotional attachments because of what they have undergone together and rapidly develop a shared disaster culture of stories, symbols and memories. (Gordon, 2004a, p.12)

As communities begin the recovery process, fusion can become obstructive because it can create tensions between different fused groups or between fused groups and those not included in the fusion. Borrell and Boulet (2009) in their Australian bushfire research found insider groups bonded against outsider groups, with the criteria for insider or outsider status based on whether you lived in the community prior to the fires, were in the area when the fires happened, lost property or a loved one, stayed in the area after the fires, and/or received substantial aid. "The tight 'fusion' associated with insider/outsider divisions was visibly evident in the school grounds, where pupils would arrange themselves in tight huddles almost physically excluding anyone else but their 'own kind'" (p. 12).

To support communities to rebond, Gordon recommends, "developing a new flexible set of bonds to bind the multiple, disparate elements into relationships (2004a, p. 20). These relationships require clear communication channels which, "facilitate opportunities for new bonds and new bonds lead to new structures, which in turn lead to new post-disaster identities" (p. 20). Gordon also suggests rebuilding community systems and norms, maintaining communication links, providing relevant, timely and accurate information and encouraging community meetings, self advocacy and collective activity.

In Thornley et al.'s (2013) study of the Canterbury earthquakes, they found four key factors that influenced a community's ability to respond and recover from a disaster. Firstly, pre-existing community connectedness played an important role. They also

noted the importance of communities reconnecting through community events. Secondly, the way in which a community participated in disaster response and recovery activities impacted on their levels of resilience. Thirdly, where communities took a strong role in local decision making, they gained a sense of empowerment. Fourthly, it was necessary to acknowledge the need for support from outside their communities, especially from local and national agencies. Schools as communities themselves and as integral parts of their wider communities modelled these resilience factors. They modelled connectedness, provided connective links and events, actively engaged in response and recovery activities, made many of their own decisions and took advantage of offers of help.

Gordon (2004a,b, 2007) also suggests building on community symbols, rituals and identity in a way that preserves continuity with the past while promoting a new vision. Community meetings, social events, commemorations and memorial sites all help bring a community back together. Schools communicated through websites, Facebook, texts, Twitter, newsletters and on-site meetings. Community counsellors, social workers and other recovery agencies were temporarily located in schools. Schools were the sites of community information meetings, family fun days or anniversary services. Cassim (2013) suggests that personal objects, symbolic spaces and everyday practices also allow disaster participants to re-story their lives and remember lost loved ones. Different ways were found to mark the events and remember those who died. One school planted a tree, another put plaques in significant places, yet another placed a seat overlooking the city for people to sit and contemplate.

School B chose as its post-disaster project to create a community mosaic.[3] In 2012, a group of senior students (aged 11 and 12 years) designed the concept for the mosaic. Over 2013 the mosaic took shape. It would be four curved panels creating a circular design – early history, before the earthquakes, during the earthquakes and their hopes for the future. Broken bricks, tiles and crockery from local homes were included in the design. Every child in the school contributed in some way by drawing an image, selecting, cutting or placing tiles. Parents and local community members donated materials and labour. A men's group made seats to be placed in the centre. The community created a garden around the mosaic with plants from red-zoned homes (those designated for demolition). The school drew the wider community together in a way that engaged them in envisioning a positive future and that would provide a commemoration site and symbolically mark their journey to recovery.

5.2. The role of principals and teachers as crisis leaders and managers

One of the principals in the study said that the earthquake experiences had "certainly changed the basic job description", yet principals all over the city appeared to rise to the occasion.

Failed leadership in the aftermath of Hurricane Katrina provided an opportunity for researchers to examine how informal leaders emerged to fill the void (Hawkins and Maurer, 2010; Porche, 2009). Porche found there are four leadership stages during a crisis: (a) *pre-crisis* (planning and preparation for possible crises); (b) *crucible* (the tipping point where someone needed to take charge); (c) *crisis* (managing immediate and short-term decision-making); and (d) *post-crisis* (debriefing and envisioning a new future). Prior to the earthquakes, schools already had emergency response policies and plans in place. The September earthquakes tested the strength of these. Much was learned about the place of a school in its community, physically, socially and psychologically.

That schools had people able to step into crisis leadership roles aided the community's short and long term recovery.

The emerging leaders in Porche's (2009) Hurricane Katrina study shared the following characteristics. They were visible, decisive, trustworthy, respected and willing to engage in frontline work. These characteristics accurately describe the principals and teachers across Canterbury, from this study, and as described by the Education Review Office (2013). Similarly, Rego and Garau (2008) found that crisis leaders need to undertake complex actions simultaneously, including facing emotions, remaining positive, focusing on principles, showing sincerity, taking action and communicating in an emotionally stable manner. One teacher notes that the role of school leadership during the earthquake was not widely recognised. She felt that the city should have celebrated:

> . . . what everyone had done to keep the Canterbury schools running, principals, and caretakers and so on. Compared with other sectors, such as business and engineers. . . the city council or the Fire Service and its poor leadership, the education sector worked really well. (Teacher, School A)

5.3. The role of schools in supporting emotional recovery

Three key strategies suggested by researchers to support children's recovery on return to school following trauma are returning to regular routines, providing distraction and using the arts or other activities for emotional processing (Cahill et al., 2010; Gibbs et al., 2013; Prinstein et al., 1996).

Schools were very good at the first two strategies. Principals, teachers and caretakers repaired and tidied the schools as best they could so that when children returned it would feel familiar and safe. They operated the school day along the pre-disaster lines albeit a little more flexibly. Teachers reported that they were less focused on outcomes and more focused on a "pedagogy of love and care" (O'Connor, 2013). Children reported however that there were more fun activities. These were designed to make school a less scary place and to provide a distraction from rumination.

Disasters take their toll on children's academic, social and emotional development (Cahill et al., 2010; La Greca, 2006). Yet research on helping children without the symptoms of high levels of trauma suggests that emotional processing, especially through arts-based activities, is an important post-disaster activity (Cahill et al., 2010; Prinstein et al., 1996). Emotional processing is defined as "a diverse set of physical, cognitive and affective actions that lead to absorption of emotional disturbances. . ." (Prinstein et al., 1996, p. 464). Without appropriate absorption, reminders of the event can interfere with normal functioning resulting in nightmares, distress or listlessness. Controlled and repeated exposure through relevant conversations, calm rehearsals, drawing, play or drama can contribute to appropriate absorption, especially when it provides a form of protective distancing such as through metaphor, analogy or storying (Cahill et al., 2010). In Fukushima, the Ministry recognised the importance of sports, outdoor education and the arts in helping children's recovery from the 2011 triple disaster. They offered thirty-six different programmes covering music, drama, literature, arts and film (MEXT, 2012).

In Canterbury, School E, a school badly damaged in the February earthquakes, participated in the "Teaspoon of Light" drama programme in which children assisted a fictional character repair her torn cloth of dreams (see, O'Connor, 2013). Three years later a parent reported that her daughter had made her own dream cloth and slept with it under her pillow to calm her through the aftershocks. A teacher also recalled that it brought the school together as one – staff and students alike. It not only provided distraction but also helped them put their own experiences into

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[3] See Mutch (2013a).

context, to understand that all kinds of people face adversity but find ways to overcome this.

Schools often had children talk, write or draw about their experiences but it was commonly reported that once this was done, it was time to move on from the earthquakes. The five schools in the case study who undertook school-based projects came to realise that recovery is a longer term process and that both children and adults move through different stages, discovering new things about themselves and others as they gain emotional distance from the event and incorporate it into their personal histories (Bateman and Danby, 2013; Gibbs et al., 2013). Cassim's research after the 2004 Boxing Day tsunami found that: "The reconstruction of life narratives does not cure; instead it helps people make sense of events, and cope with and live alongside the aftermath of the disaster" (2013, p. iii).

6. Conclusion and recommendations

In conclusion, this study has provided further insights into the role of schools in disaster response and recovery. The five schools in this study were located in different parts of the region affected by the Canterbury earthquakes and covered the range from high to low socio-economic communities. These schools played a major role in community response and recovery. In the response phase, they were emergency shelters and places of information and support. In the recovery phase, they were sites of community rebonding and havens of calm and security. Principals and teachers put their own personal fears aside and stepped into emergent crisis leadership roles. Whether organising the evacuation of students and then reuniting them with their families or leading their schools and classes through envisioning a new future, they modelled positivity and stability. Schools ensured that students, staff and families were able to access the varying levels of emotional or psychological support that they needed to help them move forward. Schools returned to regular routines despite difficult physical conditions. Teachers found ways to distract children from their anxieties and help them find pleasure in returning to school. One important finding to come from this study, however, was the need for schools to engage in longer term emotional processing of events through collaborative activities that would support children to distance themselves from their experiences and begin to see the events as part of their personal and collective histories (see Mutch and Gawith, 2014).

When reflecting on what the literature to date tells us about the role of schools and placing this alongside the experiences of the schools in this study, there is still a disconnect between the role schools are expected to play and their place in wider national and community disaster planning. Recommendations arising from this study therefore, are that: (a) the location, design, facilities and roles of schools are considered in relation to what they have done, and could do in the future, in community disaster response and recovery; (b) that principals and teachers are given professional development in crisis management so that they are better prepared for what might be expected of them; and (c) that post-disaster emotional recovery of students is seen as a longer term process with programmes and funds available so that schools can better contribute to students' long term recovery.

As climate change, terrorism, technology and other factors contribute to the increased possibility of communities facing unexpected events that cause major physical damage and psychological harm, it is timely that the role schools have played in supporting their communities through such events is celebrated and that the role that they will be called upon in the future to play is acknowledged. Preparedness is less costly than response and recovery. It makes economic sense and it makes moral sense.

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