

Learning to Trust: Relational Spaces and Transformative Learning for Disaster Risk Reduction Across Citizen Led and Professional Contexts.

ABSTRACT

Efforts to address disaster risk reduction have predominantly focused on top-down methods of risk communication, rooted in assumptions of knowledge deficit. Alternatively, deeper learning that allows for capacities to be enhanced via Transformative Learning (TL) practices that enable individuals to move from intentions to behaviours may be required. This requires critical reflection that allows acceptance of ideas that can be tested and found to have efficacy.

Fieldwork interviews took place in April-May 2015 and April-May 2017, with Community Emergency Response Team (CERT) trainees and Listos (a Spanish language family disaster preparedness) learners, in Santa Barbra, California. A total of 48 semi structured interviews were carried out (22 with CERT and 16 with Listos) alongside six interviews with trainers of these programmes. A TL framework model (Sharpe, 2015, 2016, 2018) was utilised as an analytical tool, identifying how TL occurred via analysis of narratives using narrative inquiry methodology.

Key findings showed how CERT and Listos programmes enhanced personal relationships and connections to others, creating or enhancing existing social capital. Socially constructed learning underpinned trust and maintenance of learned behaviours. The training programmes led to mastery of competency accomplishments for disaster preparedness, strengthening self and group efficacy beliefs.

Key to the success were knowledge brokers working via informal channels, enhancing 'community connectedness' by building social networks for disaster preparedness. Overall, CERT and Listos were shown to be practice oriented, culturally and socially adapted programmes that fostered transformative learning, trust and social networks as key resources for community resilience to disaster risk.

Keywords:

Transformative Learning, Disaster Risk Reduction, Community Resilience, Trust, Knowledge Brokers.

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1.1 Introduction.

This article seeks to explore the impact of different learning contexts on outcomes expressed through value and behavioural change towards disaster risk. The experience of learning, including who learning is shared with, what is being learned and how this is critically reflected upon, are shown to build trust and enhance social capital. This is exemplified through the study of two learning interventions in Santa Barbara, California: Community Emergency Response Team (CERT) training and Listos (a Spanish language family disaster preparedness) learning programme. These went beyond improving the performance of existing practices, to open consideration of alternative goals and values, allowing for deeper learning to be maintained over time, a critical element in community resilience to disaster.

Prior attempts to generate maintenance of behaviour through educational programmes have been difficult to achieve (Benadusi, 2014; Johnson et al, 2014; Sharpe, 2017). In the recent past, education has been used by international agencies (UNISDR, now UNDRR), governments and INGO's involved with disaster prevention as a means of minimising the impact of hazards by giving people knowledge about the risks they face and suggesting how they might mitigate them (e.g., Wisner, 2006; Tanaka 2005, Page et al. 2008).

This has been partially attributed to top-down assumptions that experts, such as disaster managers have the knowledge and expertise of threats, so decide on the way that complexities of disaster risk can be simplified and communicated (Mitchel *et al*, 2008). However, there is a danger that those at risk, with perhaps intimate knowledge and capacities for adaptation are overlooked, thereby *weakening* overall community disaster resilience, something borne out in part by research presented here.

On the other hand, resilience is linked to capacity to adapt, where adaptive capacity refers to the aspect of resilience that reflects learning, flexibility to experiment and to adopt novel solutions (e.g., Walker et al, 2002). Significant dimensions of adaptive capacity include learning under conditions of uncertainty and combining different types of knowledge for learning (Armitage 2005). Learning that extends throughout a social network can be essential in increasing community resilience (Newig et al, 2010). Furthermore, social learning (Sharpe, 2019) refers to the learning of collective and cultural units as applied in the realm of sustainability studies (Armitage 2005; Diduck 2010), that may also hold promise for community resilience to disaster threats. Socially constructed learning, in which learning is shared amongst peers rather than didactically received through an instructor alone, has been linked with deeper learning (Joiner, 1989; Elwyn et al., 2001). A combination of socially constructed and learned skills and/or competencies that have been tested and critically reflected upon individually and collectively, may allow TL that builds efficacy beliefs and enables behaviour change to occur (Sharpe, 2019).

Importantly, prior research has also indicated that information alone is unlikely to lead to new action (e.g., Kolmuss and Agyeman 2002, Demos/Green Alliance 2003, Talbot et al 2007). When apparently missing information is delivered through a unidirectional model of knowledge exchange, this can result in surface level (Marton and Säljö, 1984) or single loop learning (Argyris and Schön, 1978). Conversely, TL approaches (Mezirow, 1991, 1994, 1995, 1996, 2003; Cranton, 1994, 1996) can open scope for deeper, double- and triple-loop learning (Swieringa and Wierdsma, 1992).

Such learning has the capacity to go beyond improving the performance of existing practices, to open consideration of alternative goals and values, allowing for deeper learning that may be maintained over time (see *figure 1*). While single-loop learning is primarily related to considering one's actions (improving efficiency), double-loop learning questions priority setting (how solutions are determined, e.g., Argyris and Schön, 1978) and triple-loop learning questions underlying values and assumptions (what are the goals? e.g., Sweiringa and Wierdsma, 1992). In response to the need for deeper level learning as illustrated in *figure 1*, TL (Mezirow, 1991, 1995, 1996; Cranton, 1994, 1996) is held up as a possible route to achieving this.

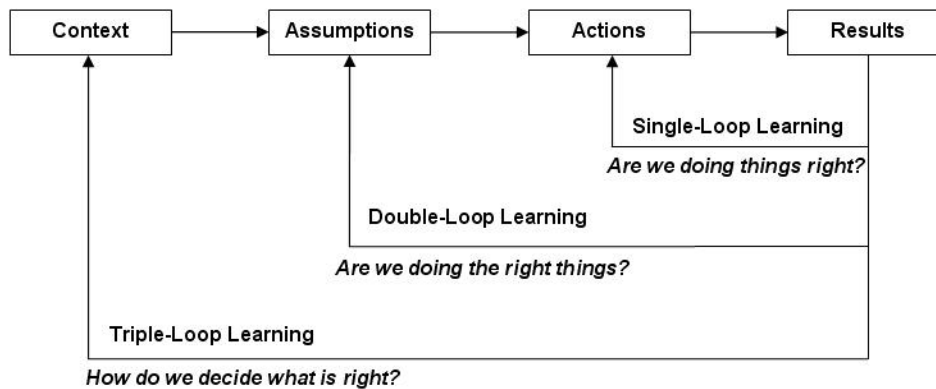


Figure 1: Deutero Learning: Single, Double and Triple Loop Learning

Source: Source adapted from: <http://managementhelp.org/misc/learning-types-loops.pdf>

1.1 Transformative Learning Theory

Transformative Learning (Mezirow, 1995, 1996, 2000) has at its heart, task-oriented, problem-solving actions with a communicative emphasis that allows individuals to examine and reinterpret meanings, intentions and values associated with actions and activities (Sharpe, 2018). Although modelled on individual learning initially, it has since been applied well to inform the group learning process (Marschke and Sinclair, 2009). Of importance to this study is its ability to make a difference to the perceptions and consciousness of the learner in a way that brings about real change.

Mezirow and Taylor (2009) suggested that TL is teaching for change, while Armitage et al., (2008) remarked that Mezirow (1995) proposed that, “an outcome of transformative learning is the development of liberated, autonomous and socially responsible individuals with the capacity to move from critical examination of their experiences to action” (Armitage et al, 2008, p.88).

Furthermore, TL is that which leads to a change in an individual’s frame of reference, defined as the “associations, concepts, values, feelings and conditioned responses that are the result of experiences that define an individual’s life world” (Mezirow, 1997 p. 5). Sharpe (2016) notes that “frames of reference can result in a rejection of ideas that fail to fit an individual’s preconceptions, leading ideas to be dismissed as irrelevant or wrong, irrespective of evidence” Sharpe. 2016, p. 214). TL and its potential impact on frames of reference are therefore suitable for addressing DRR through learning programmes.

Central to TL are the phases of learning, which are: (a) a disorienting dilemma; (b) self-examination of assumptions; (c) critical reflection on assumptions; (d) recognition of dissatisfaction; (e) exploration of alternatives; (f) plan for action; (g) acquisition of new knowledge; (h) experimentation with roles; (i) competence building; and (j) reintegration of new perspectives into one's life (Mezirow, 1991). It is important to note that not *all* phases need to be experienced and that phases may occur in a non-sequential order. The TL method (Mezirow, 1994, 1995, 2000) for enabling individuals to develop key competencies required for on-going resilience to disaster threats, was first proposed by Sharpe (2015, 2016, 2018; see *figure 3*) and tested through PhD thesis (Sharpe, 2018) research (in part presented here) with the aim of understanding its efficacy in real-world situations. These included: Community Emergency Response Team (CERT) programmes and Listos (Spanish Language disaster aware and prepare) programmes working in Santa Barbara, California.

1.2 Learning intentions, TL and its role in enhancing efficacy beliefs

TL techniques have also been found to open scope for promoting self-efficacy and group-efficacy. Self-efficacy (e.g., Bandura, 1977, 1997) is the belief or confidence in oneself to take action and more importantly, to persist with this action. Group efficacy is a group's collective estimate of its ability to perform a task successfully (e.g., Gibson, 1999, Whiteoak et al., 2004). Bandura, (2000) argues that self and group efficacy increase confidence and are associated with longer timeframes for the maintenance of learnt skills. However, maintaining practices that an individual has learned without critical reflection (Mezirow, 1990) may weaken competency and effectiveness of their actions generating a form of resistance to change and stymying innovation. And while self-efficacy and by extension group efficacy enhances confidence in the ability to carry out a task, if this becomes an automatic response without continued learning, testing and critical reflection, these efficacy beliefs may become flawed over time. This is because one-off learning experiences are unlikely to sustain resilience in individuals, whereas being part of on-going learning may help to build both confidence and competence in personal and group contexts.

Guided learning pedagogies (e.g., Bruner, 1961) can aid this process, enabling the learner to be active in their own learning. This indicates a preference for experiential learning (Kolb, 1984) and, to return to the deutero learning thesis from the introduction – one that encompasses discussion of issues, obstacles and efficacy of actions. Such interactions are co-

constructed (Vygotsky, 1978; Bakhtin, 1981; Resnick, Levine, and Teasley, 1991) with consensus fostering individual critical reflection.

A key component to achieving TL that contributes to DRR, are learning intentions, including for example, the aims of a teacher/facilitator and their curricular that influence practices and outcomes. When these are inclusive in a meaningful way, this allows learning to be a shared and socially constructed process. This strengthens bonds of trust, efficacy and competency, reducing community vulnerability by bringing together disparate individuals, groups and agencies that learn to plan for, prepare and respond to disaster risks.

This builds outwards from assumptions about communities and the way in which they are organised. In particular, prior assumptions (from disaster professionals) regarding community disaster literacies, actions or inaction are challenged, discussed, observed and understood via the learning process. This allows the learning to become both transformative and transgressive in nature and practice because assumptions (characterised by Mezirow as ‘automatic thoughts’) can be acknowledged, explored through new social connections and adapted to include old and new information, learning or practice. It manages to challenge old routines, attitudes and practice, enhancing the latter, while negotiating threats to the former.

1.3 Exploration of Social Capital, Trust and Reciprocity.

Fieldwork with CERT and Listos (see box 1 for more information), identified trust as being a key determinant in enabling stronger social capital, (Putnam, 1995). The role of trust in organisations (e.g., Giddens 1990) was also highlighted as a requirement and seen in the role that both CERT and Listos played. Putnam, (1995) defines social capital as including: “features of social life—networks, norms and trust—that enable participants to act together more effectively to pursue shared objectives” (Putnam, 1995, pp. 664–665). It is likely that such trust is context specific and underpinned further by interpersonal relationships that evolve into social capital. Pelling and High (2015) characterise this as being influenced by bridging ties (common goals among contrasting identities) and bonding ties (co-identifying individuals from ethnic and religious groups). In the contexts studied, this was framed in slightly different ways including both bridging and bonding ties overlapping to create the “social raw material that shapes capacity to identify new information, learn and cope with change” (Pelling and High, 2005, p 311). Such adaptability, including learning, are key to

addressing to a range of issues, including disaster risk reduction.

But what is meant by trust? Fukuyama (1995), defines trust as:

“the expectation that arises within a community of regular, honest and cooperative behaviour, based on commonly shared norms on the part of other members of that community.”

Fukuyama (1995, p26)

Such norms are likely to encompass professional standards and codes of behaviour, exhibited in the contexts studied. The organisations studied (CERT and Listos), played important roles in engendering and maintaining bonds of trust between communities and organisations. Giddens (1990) expresses organisational trust through something he defines as ‘facework’ He describes facework as: “trust relations which are sustained by or expressed in social connections established in circumstances of co-presence” (Giddens,1990, p.80). In other words, ‘being present’ helps transition the organisation through their interactions on an interpersonal level into positions of trust that is accepted, rather than faith in abstract systems (Giddens, 1990). But facework and the implied trust that it supposes, comes from interactions between the organisation and individuals and vice-a-versa, are also influenced by a range of other factors. Examples include, power relationships, the attitudes of the individual and even the influence of an individual’s mood at any one time (Parker et al, 2008).

The benefits of trust are shown in *figure 2*. Connections can be drawn between assertions made through the definition of trust (Fukayama, 1995) in terms of expectations, commonly shared goals and its benefits which might be viewed as outcomes. Consequently, the potential role played by learning organisations in bridging the gap between intention and behaviours when responding to disaster risk is crucial. If facework interactions create trusting relations through interactions and social connections, then this will likely have an impact on how information or learning is also trusted. This is important because trust is also connected to self-efficacy beliefs (e.g., Bandura, 1997), which can influence an individual’s likelihood of initiating behaviour change and actions to regarding disaster risk.

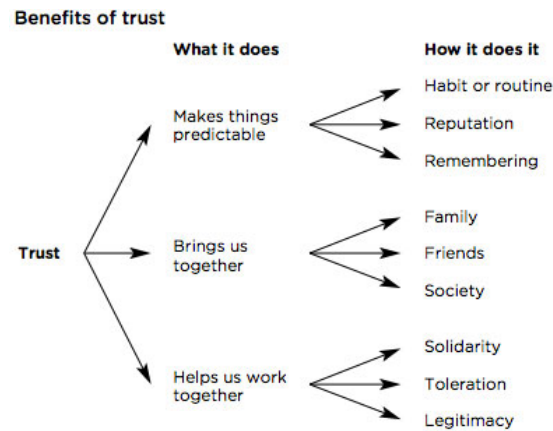


Figure 2. Benefits of Trust. Source: Misztal, 1996

2. Focusing the research with hypotheses.

Collectively, these theoretical explorations provided a framework with which to identify and assess TL and its drivers. The study populations, introduced below represented a specific social context for learning within a range of formality:

1. The Community Emergency Response Team (CERT): This group provides formal training courses for local actors at risk to become community emergency response teams.
2. Listos: A less formal learning programme aimed at Spanish speakers in Santa Barbara, centred on personal and family preparedness.

Three central hypotheses were examined in each study context to understand how new learning, training or life events impacted on the likelihood of transformative learning taking hold at the individual, community or organisational levels and in a range of formal and informal contexts. The potential for TL to occur within each context and the resultant impact on attitudes, behaviours and actions requires examination. This included the time and spaces given over to themes of automatic response, efficacy of new learning, testing and critical reflection. These themes were drawn from a proposed visual TL model (Sharpe, 2015, 2016, 2018 and *figure 3*) as a logical first step in identifying key phases of TL with a view to assessing their impact.

Box 1: Why study CERT and Listos?

The Community Emergency Response Team (CERT) is ideally placed to study both the process of and the impact of transformative learning as applied to the field of DRR. The organisation's programme taught to a wide age group, including high school students, university students and local community members of all ages and backgrounds.

The CERT concept was developed and implemented by the Los Angeles City Fire Department (LAFD) in 1985, partially in response learning about community members who had attempted to rescue others from collapsed buildings following the earthquake in Mexico City but had died or become seriously injured as a result. It was recognised that following a similar event in scale or magnitude in another earthquake or other hazard prone areas such as in the tornado belt, it would be community members who would most likely be on hand to help others, while lacking the resources to do so. The [Whittier Narrows earthquake](#) in 1987 underscored the area-wide threat of a major disaster in California, re-affirming the need for training of civilians to meet immediate needs following a disaster (Bolin, 1993). As a result, the LAFD created the Disaster Preparedness Division with the purpose of training citizens and private and government employees.

CERT In Santa Barbara, California was started in the University of California, Santa Barbara (UCSB) by their Campus Emergency Manager (DPC J)** It has since expanded into the local community and high schools. Parents of students who came to see their children undertake the end of course drill also became interested and wanted further information. This expanded into the Latinx community which leading to Spanish Language CERT as well as the development of introduction to emergency preparedness classes, called 'Listos' which is Spanish for 'Ready!' The discovery and connections with Listos trainers and trainees made on the first fieldwork visit allowed for a second visit to specifically study Listos and interview these groups as well as observe both Listos and CERT classes. CERT training consisted of 24 hours of instruction, exercises and learning followed by a two-hour drill, whereas Listos is more conversational and centred around general family preparedness.

CERT sits somewhere between the formal and informal in terms of education as it has a formal curricular and structure approved by FEMA that must be followed, but with students volunteering from the community with a wide range of backgrounds, experience and level of education. Because the emphasis is on experiential learning, testing (written and practical) and evaluation (peer and instructor) there is the opportunity to allow students to transform how they think through the problems posed by disasters (cognition) as well as how they are equipped to deal with the shock of the event itself (behaviour) and finally what they believe they will be able to do in as responders (efficacy of actions).

Box 1: Why study CERT¹ and Listos? Providing context for their development and relevance.

**See Appendix A for respondent look up tables.

¹ CERT participant training manual can be downloaded from to garner what is studied and the detail that this includes. There are eight, three-hour units followed by the drill which acts as a 'final exam': https://www.ready.gov/sites/default/files/2019.CERT_.Basic_.PM_FINAL_508c.pdf

2.1 Research Hypotheses.

The hypotheses chosen are outlined below, with brief context offered:

H1a = Providers of learning opportunities frame learning intentions that dictate the depth and maintenance of learning.

Learning intentions (perspectives of a curriculum or pedagogy) have the ability to impact on automatic thoughts, critical for TL. Automatic thoughts may also extend to behaviour and (in)action so learning intentions that don't address this will not allow learning to evolve.

H1b These learning intentions opens space for learners to acknowledge automatic responses enabling views, attitudes and practices to be re-evaluated.

H2 = Social construction of learning and associated social relationships are key in generating learning outcomes that enhance adaptive capacity towards community resilience.

This hypothesis tests the concept of community resilience that lends itself to being considered as not solely a property that is invested in individuals but also, potentially, as a property of the entire social network (e.g., a community of resilience practice: Deeming et al., 2015).

H3 = Critical reflection is an enabler of transformation via learning

Crucially, for learning to be transformative, critical reflection is required (Mezirow, 1990, 2000). Critical reflection is proposed as a mechanism through which to make sense of what is being learned before applying it to thinking or actions. Although TL holds promise for the future development of community resilience, it is bounded in this conceptualisation by the presentation of resilience as a form of maintenance. Thinking and practice around resilience needs to move from the reactive to the proactive, but this is still challenged by choices that maintain them in this state. Critical reflection rooted in TL may open the door to more proactive and impactful disaster readiness.

3. Methodology and fieldwork

Fieldwork investigations sought to explore the need for TL to enhance disaster risk reduction (DRR) *practices* in communities. This was investigated using narrative inquiry interviews, semi-structured in nature and informal observations of learning interventions (see appendix

A2, a table that summarises and justifies each approach). Fieldwork took place in Santa Barbara, California in April-May 2015 and April-May 2017. A total of 48, 25-30-minute interviews were carried out, with 22 from CERT trainees and 16 from Listos learners/trainees. These were with age ranges from approximately from 19-64 years old, although this was not an explicit question asked, but an estimate. A further six interviews were carried out with trainers and leaders of these programmes.

As the research was broadly interested in the spaces for critical reflection as a key determinant of TL for DRR, narrative texts were also examined against known processes and themes of TL, as illustrated by *Figure 3*. The aims for narrative inquiry interviews were to provide a reflective space for interviewees to explore their own experiences of CERT and Listos programmes. Respondents were asked to reflect on past experiences, their responses to these and their future intentions (for learning as well as action). Narrative inquiry interviews allowed for the lived stories and experiences of respondents to take precedence.

In order to be prepared for fieldwork, a number of process guidelines were carefully researched and decided upon. In particular, the various components that make up the narrative inquiry process including telling, transcribing, analysing and validating as well as recognising the limits of such an approach. Clandinin and Connelly (2000), clearly describe the methods while providing a basis for the research approach to be taken in the field. These include:

1. Recruitment and selection of participants.
2. Interview of selected participants, allowing each to tell the story through use of open-ended questions (creation of field texts).
3. Verbatim audio transcription.
4. Numerous readings of transcripts that will extend during each stage of the analysis, coding, and composition processes.
5. Analysis of transcripts using Mezirow's phases of Transformative Learning alongside the TL Framework developed and shown in *Figure 3* to identify themes.
6. Coding of the field texts.
7. Formation of interim research texts.
8. Composition of final research texts.

(Source: Adapted from Clandinin and Connelly, 2000).

Following verbatim transcription, each narrative was read through twice with coding of transcripts using Mezirow's phases of transformative learning (Mezirow, 1991; *Figure 3*) to draw out themes. However, during listening, reading and coding, further themes became

apparent such as self-efficacy, or community connectedness for example. Once these had been noted, annotations were made to these codes to provide justification or nuance where necessary. This allowed for an understanding of each code's pertinence for use and inclusion in the research and enabling connections to be made to other codes or themes. This allowed for a high level of academic rigour when coding and analysing, making every attempt to avoid bias and maintaining high ethical standards as a researcher.

Interview analysis focused on the differences and similarities regarding extent, depth and impact of any TL. This provided a useful comparison to examine the social and cultural context for learning brought about by the nexus of geographies that govern risk, vulnerability and capacity in Santa Barbara, California, through analysis of CERT and Listos narrative inquiry interviews. Specific contexts were used to highlight strengths and weaknesses of the TL model as part of an investigation of what might be useful to other at-risk communities. In other words, making it possible to extrapolate the utility of the visual TL model proposed by Sharpe (2015, 2016, 2018) at enabling community resilience to disasters (see *Figure 3*).

This allowed the methodological framework to be tied across the various lives of learning in which opportunities for embracing the challenges raised by new learning might be adopted, thereby making the research highly applicable, while signposting how it might be further implemented in the field of disaster management. In particular, it was discovered that TL processes offer opportunities to challenge current practices that have, for whatever reason not evolved beyond or responded to, changes that have occurred in society, economy or environment. This may be the result of cultural practices, organisational structures or governance that have caused such stasis. Without challenges to such hegemonic devices, the idea of adaptability and resilience to disaster threats cannot operate at levels required to reduce the impacts of future hazard events.

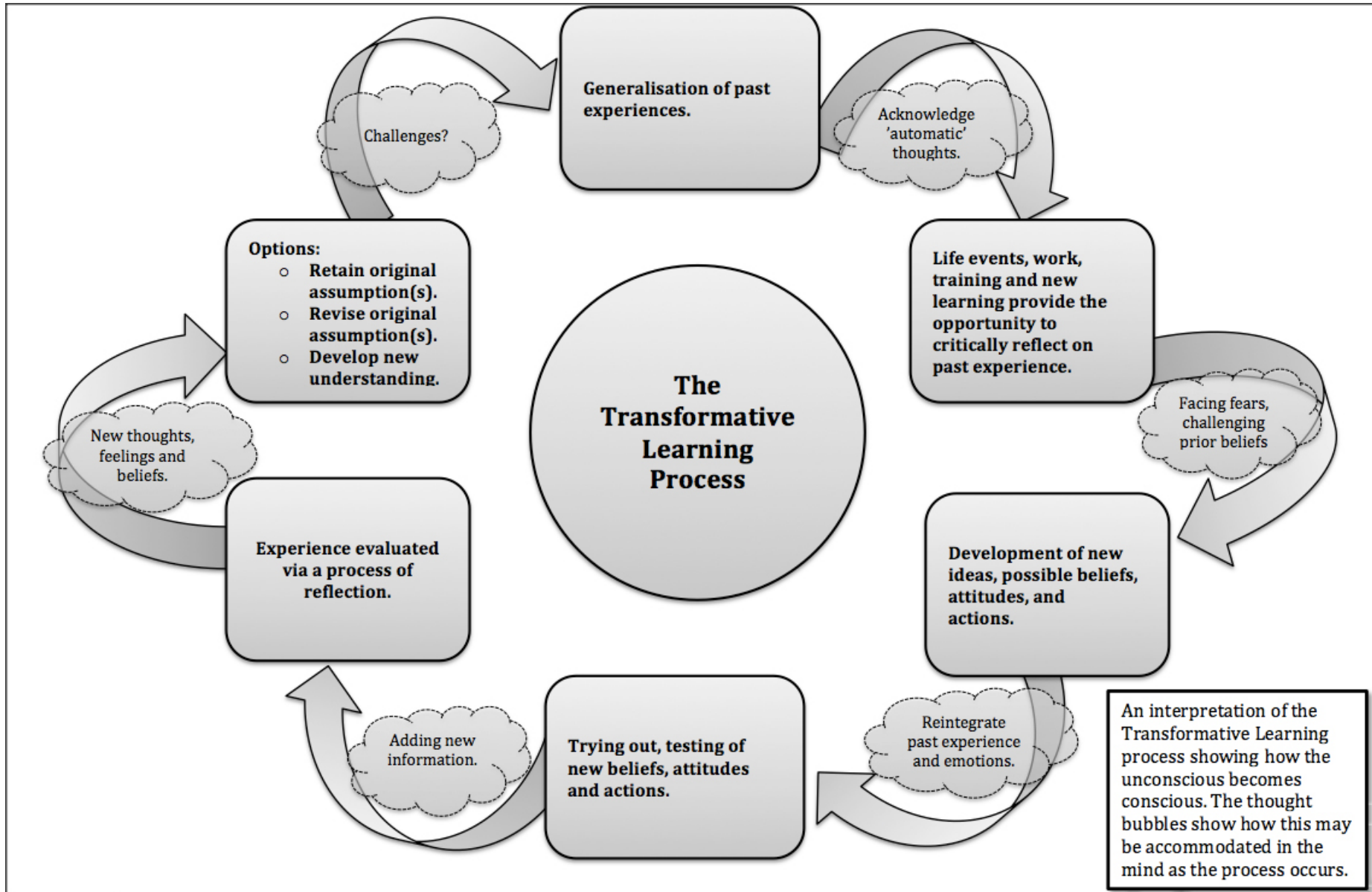


Figure 3: The Transformative Learning Process (Sharpe, 2015, 2016, 2018).

3.1 Results

Following interviews across all fieldwork sites, recording from an MP3 recorder were downloaded onto a hard drive and verbatim transcriptions then typed up. In total 144,438 words were transcribed. Following the transcription, texts were imported into qualitative data analysis software; in this case software called MaxQDA. This allowed the transcriptions to be coded with key terminology and descriptors of TL based upon the phases of TL (e.g., Mezirow, 1991, 1996) as well as the visual model (*figure 3*). This allowed for the validity and efficacy of the model to be tested against the lived experiences of interviewees as they shared their narratives. In total 88 codes were identified, which included subsets of codes. This allowed for a thorough analysis of narratives in relation to TL.

In particular, codes were applied to narrative passages that described how an event, experience or training initiated a challenge to interviewees' habits of mind. Furthermore, the extent to which this triggered reflection (shallow or deep) and/or caused changes to practice in some way was also noted and coded appropriately. Additionally, codes that were not specifically related to particular phases of TL but were also used to understand the extent to which processes of social learning, participation and trust became significant in the overall learning process. These were considered relevant as they illustrated that learning that transforms an individual doesn't occur discretely via internal reflection alone, but through interaction, verbalisation, testing and consideration with one's peers.

4. Analysis

4.1 Teaching, Learning and Doing: What is their role in bridging automatic responses?

Returning to hypotheses H1a and H1b, both relate to learning intentions and its role in opening spaces for learners to acknowledge automatic responses while enabling views, attitudes and practices to be re-evaluated. Curriculum delivery, the role of the trainers, and how guided learning approaches allow learners to practice what they learn, make mistakes and critically reflect are essential in this process. This

combination allows students to experiment and try out different ways of doing something as well as working through problems on their own and as part of a team. Relevance of learning and its personalisation occur via the curricula, which gives time for practical demonstrations followed by practice. This provides rigour in the learning while personalising the experience. Table 1 highlights narrative pertaining directly to what was coded as ‘relevance of learning’. Automatic responses are identified and used to help to frame each person’s meaning perspective as they make sense of new learning, comparing it to what they either knew or assumed previously, before undergoing modifying it in a new frame of reference:

Narrative extracts illustrating how relevant learning, informed by curricula helped learners understand it, transforming their schema of understanding:
So having the training as a strict set of guidelines is really helpful because even though sometimes it’s in your nature to go against it, if you are feeling anxiety at least you can go, well at least no one is dead. Even if it’s not what I’m feeling, or I’m feeling stressed out, or I don’t really know what to do. Having the set guidelines. (C8 us)
I think there was always the reflection back on the day. (C10 SBR)
The class the skills are really useful, say like learning to how to treat a burn. Learning how to splint. They’re useful in the disaster, but they are also useful in real life. You never know. The recovery position...Making sure that people don’t choke on their own vomit - very useful in college. (C7 us)
I wanted to run after them too, but I kind of stopped. And I’m like, hold on! We don’t even have a plan yet; so don’t go into the building. We need to get the fire-team; we need to get search and rescue going to help rescue the victims. We have to assess the situation. And so I think knowing the guidelines, you know, this course very much stresses the continuous process of sizing up your situation. I think that definitely, since it is stressed so much, I think it definitely showed in the scenarios. The training. (C20 SBR)
But coming back and teaching has made me more comfortable by explaining how you do this and helping people as they are learning how to do it as well. (C7 us)
But it’s cool to actually do it you. It may be more comfortable. Practice makes you willing to like... I would hope to do in a real situation. (C7 us)
You would hope that by this style of gentle instruction and hands-on relaxed environment will help reduce that and make it not such shock. (C10 SBR)
So, the chapter where you learn how to tie a bandage, I have done this a long time ago the Red Cross, but I haven’t done it in years, so it helped doing that at a slow speed and working with folks. (C12 SBR)
And I think this was our first precursor to this drill in which you had to think more comprehensively and not just chapter by chapter. Not just one topic, it was all the topics! And I think it would have been good if time had permitted to just do one more of those to solidify. Because after that, Immediately I thought, here is what I would like to do next time. I was ready to go again. Just throw me the ball again; I’m ready to go again. And I wanted it to be a little more complicated because I wanted it to solidify that training. (C12 SBR)

Table 1: Curriculum made relevant to learners understanding of how it allows them to personalise it, transforming their schema of understanding

The passages of narratives highlighted above show how learners perceive relevance of learning allowing them to understand the wider implications of their learning to helping others in the most efficient way possible. For example, understanding *why* they needed to do certain things in a certain way, even if it goes against their initial instincts or perception of logic:

“this course very much stresses the continuous process of sizing up your situation. I think that definitely, since it is stressed so much, it definitely showed in the scenarios” (C20_{SBR}).

Even in this small snapshot (*table1*), where learners describe the relevance of the learning, the phases of transformational learning described by Mezirow (1991, 2000) were apparent in the narratives of interviewees (C10_{SBR}, (C8_{US}). The CERT programme managed to provide a bridging process between automatic thoughts that are parsed to become rational and logical in stressful, hectic and messy situations. There is a tacit understanding why this is the case: knowledge, learning, practice, repetition, testing, reflection, modification and reframing.

What makes this transformative is the chance to test new learning and make mistakes. The instructors appeared adept at letting students try out different ways of doing something, working through problems, experimenting and letting individuals’ form a consensus and try it out. Consequently, learning in both CERT and Listos was *socially constructed*. This is purposeful. Being part of a team is instilled by trainers and via supporting curricula through the course, with most operations carried out in pairs. Self and group efficacy developed as well as sharing the burden, while having a practical advantage of allowing a ‘buddy’ system to develop, with two pairs of eyes assessing a situation and being able to offer advice or get more help if required. It was here that evidence for hypothesis H2 was found regarding social construction of learning in the role of enhancing adaptive capacity.

There is another, more nuanced but equally important role in building community resilience. Through observations it was noted that the trainees learned to communicate with someone who may not be known to them, learning about their strengths and weaknesses, which allows them look out for and be responsible for

them within the wider team. These are key skills in building the community aspect of community resilience because people realise they are more connected to each other and can learn from each other, for instance. This becomes an enabler for better communication, less hostility and more considered discussions. In other words, automatic responses are acknowledged. This does not mean that at this particular time there has been a perspective transformation, but that individuals are aware of the need to be less combative and entrenched in their ways of thinking that might cause conflict with their partners attending the same class as them in learning how to prepare. Common ground is found and sought. This led to something imperative for this sort of learning: *trust*.

This is reinforced by course materials that have the FEMA (Federal Emergency Management Agency) certification logo on the front and throughout the PowerPoint slides and printed materials. This legitimised the training enabling learners and trainers to know that the information was well researched and informed by wider practice of Emergency Management Technicians (EMT's), including fire fighters and paramedics. This provided a sense of professionalism in outlook and this was mirrored in the observations made of classes while in Santa Barbara (three CERT classes, one Spanish CERT and one Listos class). Giddens (1990) calls this organisational trust – trust conferred by an organisation onto an individual. Through the creation of platforms of trust, such as might be seen in the contexts studied here, the building blocks for wider social movements and transformations are possible.

4.2 Storied Lives: how socially constructed and shared learning bridged efficacy gaps, paving the way for transformation in disaster preparedness.

Building on the H2 hypothesis, further evidence was found that when learning engages individuals, it allows them to test it and experience the bounds of this new learning. A small selection of extracts coded as self-efficacy and confidence is included in *table 2* to illustrate the range of competencies that individuals described themselves as having, following their involvement in learning that to them, proved to be transformative.

Examples shows a clearly cognised and expressed belief in their ability to perform under duress in emergencies as well as showing confidence in other ways. One of

Selected instances of self-efficacy and confidence from across case studies:
To know to know what to do for me and my family; and be prepared to help the community. (L1 G)
I know how to use a fire extinguisher and feel more empowered by knowing the skills that are not considered part of the normal. (L4 G)
And I feel more comfortable with treating injuries. (L4 G)
Nobody knew what to do for him. So, when I saw him, he was shaking a lot, so I saw him shaking I assisted him, and I try to help them I put a sweater underneath his head. And I assisted him until the ambulance came. (L6 G)
So, I'm better prepared. I feel confident Learning from Listos because of how my I can help my community. I can help people. (L6 G)
So that's when I feel very comfortable learning and putting into practice what I had learnt. I feel very comfortable and very confident about Listos. (L6 G)
I'm also able to assess the extent of the injuries as well as being able to take them today correct triage area when an emergency or disaster happens. (L9 E)
Yes, now I know what to do in that moment and I know how to react. (L7 E)
I have the information to know what to do so I'm more likely to do it. And help. (L9 E)
I feel more secure about knowing what to do. (L7 E)
The training has allowed me to be able to help whereas before I might have been wanting to help but felt unconfident and unable to do so. And now I have the tools and the confidence to help others. (L11 E)
So that was something that helped me feel very proud of myself, and of the program. Because I help somebody! And I could help somebody. So that made me feel so proud of myself! That's the way it transformed myself (<i>sic</i>). My life. (CT1 SBR)
A tiny earthquake that happened about year or two ago here; but I think because I said I was just, like, I have to do <i>this</i> and not run outside for instance. I knew what to do and what not to do. (C3 US)
I know how in a given situation and what to look for, how to do some basic rapid assessment and then have to do some good in this situation .(C2 SBR)
I actually could if it were called for, you know come into a situation and if it were necessary assume one of a variety of different roles and do it with confidence. (C2 SBR)
The power of being able to respond effectively as a group of CERT's. (C2 SBR)
You don't really have control. Everything is just...it's a disaster! So, for me to be able to have at least a handle on part of the situation that is really reassuring...comforting. Yes, I think that is the best word I can describe that with. (C7 US)
But I also feel more confident when I talk. Because people with disabilities are out there more and more. I used to notice that there weren't so many of us out there. And now there are. (C4 SBR)
Now is about how much I am able to talk. And be heard. And I've always been worried about how intelligent I sound. And I do fine. (C4 SBR)
Because you can still be in distress if something bad happens, but your body will still remember how to do important things. (C14 SBR)
All the triage that we learned... triage was really helpful getting that look of what a disaster situation is and bringing it into use it in car accidents and things like that, involving lots of people. It was good to really have that practice. (C17 LAR)

Table 2: A selection of coding from narrative inquiry and semi-structured interviews across all case studies, showing the varied ways in which learning enhanced current or enabled new efficacy in dealing with emergencies as well as creating core competencies with learners, useful beyond the scope of the original training/learning event.

the key findings from across the research was how individuals expressed a desire to help in an emergency, but were hesitant, unsure how to or didn't believe they had the right skillset. (L7_E, L11_E in *table 2*) Through their learning interactions and experiences, individuals had their attitudes, and in many cases behaviours transformed. *Table 2* exemplifies this, with this small selection of coded comments regarding self-efficacy taken from a much larger total (n=72), showing that not only were individuals confident in their abilities in the event of a disaster, but they had been actively engaged in helping others when small emergencies had occurred as per comments by (L6_G) and (C3_{US}) in *table 2*.

This was augmented by CERT's approach of not solely training individuals and hoping that competencies 'stick', but re-engaging them via refresher courses, teaching them to lead their own classes or being involved in drills by acting as 'victims'. Doing so, allowed them to observe different/new scenarios, encouraging critical reflection about what does and doesn't work, allowing them to act in a competent as well as confident manner. These engagements allowed them to critically reflect on their own drills, discussing and revisiting what did and didn't work, creating stronger social bonds and networks that they will be able to call upon in addition to their own competencies in the event of a disaster.

4.3 Self and group-efficacy outcomes are built on critical reflection and sense making.

There were many examples of new pathways of sense making that opened up for not just for individuals, but also wider social networks that branched out into communities of practice. CERT training and practice allowed younger people who were beginning their journey into adulthood to re-evaluate what they had absorbed previously (the cultural, educational, familial, religious and peer experiences) placing it side-by-side with experiences and learning from CERT training, and more importantly, practice (via the drills and practice of cribbing, using fire suppression, carrying others, sizing up situations, first aid and triage). This allowed for critical reflection to unfurl in a realised manner with direct comparisons to prior learning placed against those gained from new knowledge, experience and practice.

Critical reflection in Listos students was borne from cultural and familial experiences utilised in the open dialogue approach taken to learning that meant that critical reflection was a shared experience:

“And so, people talk about when they were a kid and [will say] my mother used an onion on a burn. I will go through this and say that an onion doesn’t do anything; it may feel cool but the only thing you put on the burning is water. And we educate them using their cultural experience, right! Some examples like that...And they share everything! It is just a safe place”

(DPL L)

In this manner, critical reflection was socially constructed, and learning also. Although critical reflection may well be an internalised process, it becomes more mature when tested among peers. Although meaning perspectives may be re-evaluated and changed by new information and knowledge, transformation took place via social critical reflection. Bonds of trust and acceptance of new knowledge occurred in the group-space, as shared similar culturally constructed experiences that they now understood to be scientifically incorrect.

For example, incorrect information regarding responding to burns and cuts, came from grandmothers, aunts and mothers was often characterised as being part of ‘traditional home remedies’ (L6 G, L13 E), passed down the maternal line. It is difficult to openly challenge or state that they are wrong, even if this is the case. Doing so could isolate individuals or entrench these prior beliefs and actions (or ‘automatic responses’) making transformation difficult. However, because many Listos instructors were also brought up in Mexico (and other Southern American countries) there existed a sense of collusion, trust and understanding that might not otherwise exist. This allowed for respect and understanding that prior advice was thought to be best at the time it was given, while classes allowed for the social construction of new knowledge and new traditions.

The ways in which this was skilfully negotiated in classes allowed potential weaknesses (what TL characterises as ‘difficult dilemmas’) to give way to

strengths, so that meaning perspectives were transformed. The discursive nature of Listos learning meant that the burden for doing so was also shared. Therefore, hypothesis H2 (related to social construction of learning) was also shown to be an enabler of critical reflection facilitating transformation in learners (hypothesis H3).

4.4 The roles of observation, practice, reflection and discussion in allowing for *wider* critical reflection of habits of mind.

In the following example, in which a search and rescue drill was observed, CERT trainees entered a room full of ‘injured/dying/dead’ who screamed out, made noises or made none. Trainees had been taught to make a quick sweep of the room, making judgments about severity of injury etc., before stepping outside and talking over needs and planning a strategy of action. This was not easy, given the level of noise and chaos that they walked into, but hands-on training in this manner allowed them to override initial automatic responses, such as spending too much time on one noisy victim, rather than helping as many as possible, especially those who are unconscious, quiet and potentially in more immediate danger.

As soon as this drill was over, instructors attempted to draw out strengths and weaknesses of strategies used (or not) from trainees. The merits of such an approach were reflected upon by learners too:

“In fact, just going through the drill and actually doing the drill and then followed by the debrief we’re confronted with what went okay as well as here’s what could’ve been done better.”

(C12_{SBR})

The above quote underscores the importance of reflective practice, opening pathways to critical reflection. This quote is of note because of the use of the word ‘confronted’. This suggests difficulty or a disorienting dilemma, one of the first phases of Mezirow’s TL Theory. Indeed, the description of a search and rescue drill witnessed by the researcher and described clearly show the following TL phases:

1. A disorientating dilemma. (*Getting learners to picture the event*)
2. Self-examination of affect. E.g., guilt, shame, etc. (*What does the learner feel, and can they describe it?*)

3. Critical assessment of assumptions. (*What does it mean to the learner to feel this? What advice are learners giving themselves in the picture? How do they interpret what is happening? What is their intention at this point?*)

In this manner, exploration of the new roles that learners took on are evaluated immediately afterwards. Observing the same group of individuals ten days after their initial search and rescue exercise, it was noted that they appeared to be working with a greater sense of competency as part of their CERT graduation drill. Learning continued immediately afterwards with critical reflection initiated by instructors. This appeared to be ingrained in the pedagogical approaches and as part of the learning intentions of instructors:

“So, for instance in the search and rescue, we explain to them the making mistakes is part of the learning and is what makes it concrete for them. [We] help them realise what mistakes they’ve made so they can learn from it.”

(CT1_{SBR})

Consequently, powerful socially constructed and learned experiences unfolded, transforming individual learning from being superficial (single-loop), to having depth and maintenance. Learners cognitively constructed deeper learning through their reactions, actions and critical reflections (double-loop). This allowed individuals, and groups in the case of CERT, to undergo perspective changes that are at the root of not merely thinking through but acting on what they have learned. This allowed the value action gap between intentions and behaviours to be narrowed, partially because learners understood what could be achieved, as well as having a deeper understanding of why and how it would make a difference.

4.5 Informal approaches to learning as culturally relevant and appropriate to the Latinx community.

Although individual learning is important for personal level of development, there still remains the requirement for new learning to be shared in order for it to move beyond the tacit wisdom of the individual (Nonaka, 1991). Socially constructed, learned observations and testing provided a route towards normalisation and social acceptance of new practices. But to make an impact in the wider community, a

critical number of individuals, acting as knowledge brokers were found to be key to dispersing learning across social networks.

Within the Latinx community of Santa Barbara, where the Listos programme was developed, learning intentions were framed by knowledge and understanding of this particular community's culture, in which family identity is strong. This was possible because of the engagement of a key knowledge broker or 'maven' (Gladwell, 2000), who had grown up in Mexico and later came to the United States and became involved in local disaster preparedness. This person was able to gain the trust of the Latinx community, engaging and communicating with them and assisting them to learn effectively, whilst maintaining this engagement and practice over time:

“So, she needed somebody they could connect with; someone who taught it. And somebody that **looks like them, somebody who **talks like them**, somebody that **shared the same cultural background!** And so, **we taught CERT classes with native Spanish speakers.** And **this created a strong connection with the community!**”**

(DPL L: emphasis added)

This section of narrative highlights that nuances of trust may be stronger from having a particular cultural connection. The emphasis in the quote above was added to show the spoken stresses that this person placed on those parts of the narrative, highlighting their positionality. This observation is provided to show the sense of pride and ownership that this individual exhibited during the interview. This person was also needed as an advocate for the lived experience of many Latinx residents:

“And **only when you understand the culture do you understand that part about **wealth inequality**. And I would often have meetings with county emergency managers, and I **have to explain** that many [Latinxs] are **in their own survival mode**. And that we have to give them options! **Almost every day is an emergency**. They have to communicate that it is still doable!”**

(DPL L: emphasis added)

Understanding the positionality of others allowed for mutual trust occur, opening the door to TL. By helping to forge connections and bonds in all areas of the wider community, local resilience to disasters may be broached and negotiated.

CERT and Listos very clearly allowed “social networks to be embedded in a sense network of reciprocal social relations” (Putnam, 2000, p.19); while their ‘facework’ (Giddens, 1990), helped to build trust. Examples showed how this occurred as well as how individuals, and by extension collectives observed the strengthening of their efficacy and competency in being able to deal with emergencies. For some learners, this was further reinforced through testing of new learning through drills (e.g., C20_{SBR} and C21_{SBR}) and table-top exercises (e.g., C19_{SBR} and C2_{SBR}) or in real life when faced with an emergency (e.g., C8_{US} and L6_G).

Furthermore, when learning extended beyond the self, an understanding of the roles and responsibilities of others in their social network occurred. This included understanding their limitations alongside learning about and acknowledging strengths and weaknesses. They were more realistic about the role that they might play when an emergency or larger scale disaster occurs. This underscored their efficacy beliefs in responding to disaster threat as individuals, as well part of a growing community of practice extending beyond professional networks, seeing themselves as relevant entities that have capacities to enact change, rather than outsiders who cannot.

4.6 Being present: How knowledge brokers connect communities in the communicative domain to build trust and transform attitudes.

Knowledge brokers were most effective when they are present in the community, especially when technological engagements were not having the desired impact. Consequently, communication was adapted to meet the needs of the cultural context once more:

“Most of them don’t have social media so I have to make personal phone calls, I go to events, I go to fiestas and I start recruiting. Me, personally! And they have to see that face behind the name. So, if I say Listos, or if I say Spanish CERT, they know that it is me.”
(DPL_L, emphasis added).

This narrative extract underlines the role of the knowledge broker in understanding and adapting to cultural requirements, including making the Listos curricula more conversational. This was not the result of an accident or serendipity, but a conscious

understanding of the learning requirements of potential Listos participants (DPL L and L4 e). A higher value is placed on social relationships, familial connections and Latinx culture, than that of the learning intentions derived purely from emergency management professionals.

Such ‘knowledge brokers’ acted as intermediaries enabling somewhat disparate communities, with very different perceptions of power, privilege and experience, to learn about and from each other. One connection, led to a police officer of Latinx origin attending Listos classes, conversing about what his role as a police officer entailed. *Figure 4* shows how this impacted on the experience of one particular Listos learner, as well as how this was coded as narratives underwent analysis.

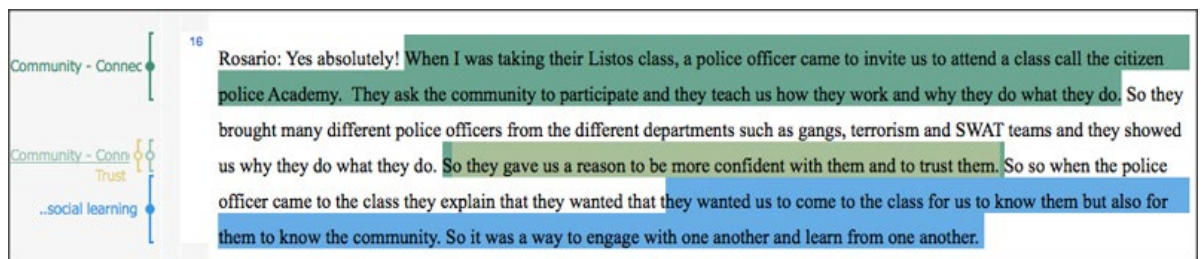


Figure 4: Coding of a section of narrative (using MaxQDA software – Verbi, Berlin) from a Listos programme interview showing how trust issues between the Latinx community and the police are addressed through community outreach allowing for learning and understanding of each other’s roles and responsibilities to be unpacked, considered and transformed. Note also, the coding of social learning and community connectedness in this narrative extract.

What this particular snapshot of coded narrative shows is how trust as a process took several steps to occur:

1. Initial outreach.
2. Attendance by an individual at a ‘citizens police academy’.
3. Learning what the police do in their different teams.

This coded narrative illustrates that there were a number of conscious and unconscious decisions from the individual, which when coupled with learning intentions and the learning experience it brought, caused this individual to reflect upon it. This resulted in this individual (and others who had talked about engaging with emergency service professionals) making the following connections:

1. The engagement with these professionals gave them a reason to be more confident and to trust them.

2. Learning intentions were considered to be transparent and open to a two-way process of learning.
3. This enabled a process of engagement and learning from one another.

This very short section of narrative provides a reasonable building block for the foundations of trust to be built upon. This example also shows how TL takes place in the communicative domain of learning via discourse (Mezirow, 2003). Habermas suggests that social systems “might be viewed as networks of communicative actions” (Habermas, 1979, p. 98). In other words, communicative action (the doors to which were opened by outreach attempts described here) might be considered as a source of new productive relations. Although Habermas (1979) was responding to and critiquing Marx’s alienation of the worker, he understood that forms of social integration established in the communicative domain as having the potential to change learning processes stating that they:

“...also take place in the dimension of moral insight, practical knowledge, communicative action and the consensual regulation of action conflicts – learning processes that are deposited in more mature forms of social integration...”

(Habermas, 1979, p. 98)

Consequently, there are parallels to be drawn between the works of Habermas that are still relevant and *present* in the community in Santa Barbara. For instance, alienation, not of the worker (although to some degrees this exists), but of lack of engagement in wider society (which brings about increased vulnerability to disasters) and borne of mistrust in police and government institutions. By bringing both together in the communicative domain with spaces and places provided by Listos and citizen police academies it is possible for transformation from mistrust to trust occur.

At first glance, this might appear to be an over-reach to make connections between the highlighted narrative and how trust is transformed. But it just happens to provide a neatly packaged version of what one person described using their words. This is what is effective about the narrative inquiry approach methodology, as well as its weakness. Not everyone makes the same connections, assertions or meaning perspectives, which from a statistical perspective might make these comments

outliers if this was a quantitative study. But in a qualitative study such as this, in which narratives provides the storied experiences and perspectives of individuals, groups and communities, it is possible to build a picture of what is observed, processed and analysed. Other interviewees talked about how trust was not only built but also provided via the learning intentions and experience as the following narrative extract shows:

“It is important that you we are **inclusive and diverse** because when disaster strikes if they **trained together**, if they **talked together** if they’ve **eaten a meal together**, if they know who the fire-fighters are, and they recognize them, **this builds trust.**”

(DPL L, emphasis added)

This observation provides a different view of inclusivity and diversity that is not racially bound and described. The terms are used in a different way to mean diversity of backgrounds, education and professions of the trainees as well as being inclusive of disaster professionals. Consequently, understanding of the meaning of ‘community’ became widened and uniformed professionals were accepted and included. Emergency management and response professionals became more visible, and the physical presence of emergency and disaster professionals helped to transform attitudes to learning, which included learners trusting their intentions and being accepting of and respecting their professional knowledge. One particular recurring theme in this short narrative extract is the word ‘together’. This is used to illustrate that being present in the same place for similar aims creates understanding of the other and initiates bonds of trust. Without such initiatives and programmes, it is unlikely that this will occur.

5. Discussion

This article sought to explore how the socially constructed and shared elements of learning affect TL outcomes for closing the value action gap between intentions and behaviours for DRR. This combines elements of social learning in which there is mastery of accomplishments through practice and observation of others with discussion and reflection on the ways in which this was achieved. It was demonstrated that learners were able to move beyond self-cognition to shared group cognition. Consequently, learners learned to place group efficacy and competence,

above that of individual competence within the CERT case study, for example. This is significant because it opens up pathways to wider TL, that it is argued is required for greater depth and maintenance of learning to take hold. Prior pathways include facing difficult dilemmas which are tackled via the learning intentions, rational discourse (part of the social construction of learning) and finally critically reflection.

The TL framework model proposed by Sharpe, (2015, 2016, 2018) was useful in identifying and recognising that the journey and sequence of events are unique to the individual, with prior phases of TL revisited or reconsidered as learners negotiate blockages or difficulties. This supports original assertions made by Mezirow (1978) but revisited at other times (1991, 2009) that a rigid ordering of phases is not required for TL to occur.

The research also supported the wide body of acceptance amongst scholars from various disciplines that knowledge and learning is constructed through social interaction (Vygotsky, 1978; Bakhtin, 1981; Resnick, Levine, and Teasley, 1991). For example, the learning intentions of CERT and Listos allowed the burden of new and challenging ways of thinking or doing to be shared through discursive practice, making it seem less overwhelming. This discourse-based reflective practice set up opportunities that included emphasis on and space for, critical reflection, a key determinant of TL (Mezirow, 1978; 1995).

Relational spaces existed within and without learning interventions explored here that impacted on shared cognition or collective learning (e.g., Barron and Rochelle, 2009), that differed depending on context. This was augmented by the personal relationships and connections to others found to be key in underpinning trust. These connections across and through social networks were driven and influenced by knowledge brokers (Oldham and McLean, 1997). Knowledge brokers negotiated the most appropriate way of using learning materials in order to have the widest community reach. They mediated the spaces between the learning intentions and community needs. They were successful because of their knowledge and understanding of competing pressures (work and family commitments) on learning, tailoring their own attitudes and teaching and learning styles to capitalise on this.

One way of examining the role of knowledge brokers is through their influence in bringing about social change. This can be linked to ‘conscientisation’ brought about through learning that enables the disempowered to face uncomfortable truths, leading to social change (Freire, 1970). Therefore, knowledge brokering can be applied in addressing the value action gap while knowledge brokers are also agents of social change:

“...brokering is designed to enhance access to knowledge by providing training to knowledge users which may lead to positive social outcomes. In this context, brokers are seen as capacity builders.”

(Ward, House and Hamer, 2009. p.3)

However, the problem remains as to how to identify and utilise such individuals across social networks. Formal attempts at knowledge brokering, especially in capacity building, have concentrated in the policy space. Critiques of formal knowledge brokering has included the time and resources required for it to be effective (Bowen and Martens, 2005) alongside a lack of knowledge regarding how it works, what contextual factors influence it and its effectiveness (Conklin, Hallsworth, et al, 2008). Consequently, further research, especially within the field of DRR, might better our understanding of the process.

In the contexts outlined here, knowledge brokering was found to occur via informal channels. In the case of CERT and Listos, part of their role was characterised as ‘being present’. This created trust and acceptance of knowledge broker’s experiences and the stories that they used to let learners navigate them. Further research, especially within the field of DRR, might better our understanding of the process.

A caveat to the implications of findings revolves around the cultural specificity of the fieldwork based around southern California for the CERT and Listos programmes. There are legitimate questions around how DRR learning differs in other parts of the world with fewer resources, for instance. Differences also tend to vary at micro levels between the human beings that make up the teacher/student or trainer/trainee dynamic (e.g., Hofstede, 1986).

Problems include the impact of social positions between teacher/student, difference in the relevance of curriculum between two different societies and differences (real or assumed) regarding cognitive abilities. This is relevant to note because learning that is successful in one country or region might not be successful elsewhere if there are automatic responses on behalf of those facilitating or the learners themselves. While understanding that thorny issues of power, gender, class and status all influence such automatic responses, TL has great potential in allowing these to be recognised and addressed through relevant learning opportunities inclusive of critical reflection.

One of the aims of the study was to assess the extent to which TL led to *maintained* changes in behaviour. This is harder to assess without revisiting the same community of practice or residential community and carrying out further interviews to explore what changes had been maintained over the elapsed time. Being aware of this as a limitation provides spaces for future research. During second fieldwork in Santa Barbara in 2017, it was noted (through recognition and on hearing their names) that two students from the University of California, Santa Barbara (UCSB) interviewed in 2015, (C13_{US} and C20_{SBR}) were now leading training for newer students on campus. Meanwhile, C5_{US} was still actively involved in drills and was also volunteering at the Fire Station. Because fieldwork occurred at two-year intervals, there was a chance to engage with other individuals that had gone on to advanced CERT classes, become CERT trainers and even carry out CERT ‘train-the-trainer’ programs. This showed that engagement with emergency preparedness extended beyond the reach of the initial outreach and training, suggesting that the learning was personally transformative to them.

6. Conclusions

The research showed how CERT and Listos programmes enhanced personal relationships and connections to others, creating or enriching existing social capital while socially constructed learning underpinned trust and maintenance of learned behaviours. These training programmes led to mastery of competency accomplishments for disaster preparedness, strengthening self and group efficacy beliefs that empowered action and maintenance of behaviours beyond the initial

training period.

In particular, CERT and Listos programmes were shown to have a role to play in changing bad habits of mind (ignoring risk or maintaining it to be the purview of others) to good habits (collective responsibility including having emergency kits, and first aid training). It would be tempting to suggest that these interventions should be scaled up and applied elsewhere. This would miss point made about the importance of trust, which is often rooted in local knowledge and relationships across social networks. Consequently, opportunities for TL are best evidenced in individuals and small groups at very local levels. There is suggestive evidence for this being partially due to the role of knowledge brokers who initiate trust through their actions, commitment and knowledge.

This was demonstrated by the maintenance of connections that occurred across and through social networks, driven and influenced by knowledge brokers via informal channels, (see section 4.6). CERT and Listos respondents characterised this as ‘being present’ in the community and ‘community connectedness’.

In particular, the building of social relationships and the ways in which knowledge brokers allowed formerly disparate viewpoints, attitudes and values to be heard, bound the learning together. This was supported and enhanced by bonds of trust that unfolded as individual’s learned and shared in experiences and training through which new learning was tested and critically reflected upon. Such transformations may be required to building community resilience to disaster threats.

This shared cognition, derived from combined experience and actions has positive implications for making links to research in other fields such as explaining thinking about a phenomenon from a particular perspective (Webb, Troper, and Fall, 1995), observing the strategies of others (Azmitia, 1988) or listening to the explanations of others (Coleman, 1988; Hatano and Iganaki, 1991). The learning opportunities, interventions and programmes outlined here may allow learners to learn new ways of negotiating problems, creating deeper transformation that go beyond initial behaviour change intentions.

This research illustrated how certain processes and experiences might be considered to be transformative, leading to a reframing of risk for individuals and communities so that appropriate responses might be considered. There appear to be clear benefits to learning opportunities that have the potential to transform habits, behaviours and actions to enable better preparedness and resilience to disasters. In conclusion, CERT and Listos were shown to be practice oriented, culturally and socially adapted programmes that fostered transformative learning, trust and social networks as key resources for community resilience to disaster risk.

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Appendices

The following are look up tables for respondent codes applied to interviews and extracts provided here. All participants gave permission for their first name to be used.

A1: Table of code identifiers, their meaning and contextual information for CERT respondents.

Identifier	Meaning	Name	Contextual Information
C1 _{SBR}	CERT, Santa Barbara Resident	Amy	Junior Emergency Manager.
C2 _{SBR}	CERT, Santa Barbara Resident	Anthony	Human Resources/ church organizer.

C3 <small>US</small>	CERT, University Student	Aura	VP of Red Cross Club
C4 <small>SBR</small>	CERT, Santa Barbara Resident	Bonnie	Volunteer, wheelchair dependent.
C5 <small>US</small>	CERT, University Student	Dulce	Student of Medicine
C6 <small>SBR</small>	CERT, Santa Barbara Resident	Eric	Fire Safety, Environmental Health.
C7 <small>US</small>	CERT, University Student	Hannah	N/A
C8 <small>US</small>	CERT, University Student	Heather	Life-Guard/Red Cross.
C9 <small>SBR</small>	CERT, Santa Barbara Resident	Hillary	Works for state legislature. Media relations
C10 <small>SBR</small>	CERT, Santa Barbara Resident	Holly	N/A
C11 <small>SBR</small>	CERT, Santa Barbara Resident	James	Waste Management, UCSB.
C12 <small>SBR</small>	CERT, Santa Barbara Resident	Marck	Santa Barbara City Worker/Red Cross Volunteer.
C13 <small>US</small>	CERT, University Student	Melissa	Pre-Med/Red Cross club.
C14 <small>SBR</small>	CERT, Santa Barbara Resident	Nicole	UCSB Librarian.
C15 <small>SBR</small>	CERT, Santa Barbara Resident	Robin	UCSB Environmental Health
C16 <small>SBR</small>	CERT, Santa Barbara Resident	Rubayi	Orfala Charitable Foundation/Volunteering Organisations Against Disaster.
C17 <small>LAR</small>	CERT, Los Angeles Resident	Sean	Ex-UCSB student. Transferred to paramedic training from MD route.

C18 <small>SBR</small>	CERT, Santa Barbara Resident	Stephanie	UCSB Nurse.
C19 <small>SBR</small>	CERT, Santa Barbara Resident	Trish	UCSB Nurse.
C20 <small>SBR</small>	CERT, University Student	Taylor	Now a trainer. CERT involved post degree.
C21 <small>SBR</small>	CERT, Santa Barbara Resident	Zach	N/A

A2: Table of code identifiers, what they mean and contextual information for Listos respondents.

Identifier	Meaning	Name	Contextual Information
L1 <small>G</small>	Listos, General	Alejandra	18 months in USA. Stay at home mother. Little English.
L2 <small>G</small>	Listos, General	Angel	Shop worker. Excellent spoken English.
L3 <small>B</small>	Listos, Braille Institute	Beatrice	Blind. Excellent spoken English. Often at home alone. Translator.
L4 <small>G</small>	Listos, General	Cecilia	Good spoken English. Listos trainer.
L5 <small>G</small>	Listos, General	Cuco	Some English.
L6 <small>G</small>	Listos, General	Dora	Excellent spoken English. First Aider at work. CERT trainer.
L7 <small>E</small>	Listos, English as a Second Official Language Class	Estela	Well-educated lawyer. Limited English.
L8 <small>G</small>	Listos, General	Jose-Geraldo	Good spoken English. Translator. Listos and CERT trainer.

L9_E	Listos, English as a Second Official Language Class	Juana	Very little spoken English
L10_G	Listos, General	Lissie	Excellent spoken English. Community Police Academy.
L11_E	Listos, English as a Second Official Language Class	Lizzy	Very little spoken English
L12_B	Listos, Braille Institute	Luis	Some English. Teacher at Institute.
L13_E	Listos, English as a Second Official Language Class	Maria	Very little spoken English
L14_G	Listos, General	Paco	City Worker/Good English
L15_G	Listos, General	Rosario	Limited English. Husband of a trainer.
L15_G	Listos, General	Sangario	Good spoken English.

A4: Table of code identifiers, what they mean and contextual information, for CERT trainer respondents.

Identifier	Meaning	Name	Contextual Information
CT1_{SBR}	CERT Trainer, Santa Barbara Resident	Bob	Security Manager, Scout Leader.
CT2_{SBR}	CERT Trainer, Santa Barbara Resident	Dora	Bilingual. CERT and Listos trained.

A5: Table of code identifiers, what they mean and contextual information, for CERT and Listos Leaders.

Identifier	Meaning	Name	Contextual Information
DPC_J	Disaster Prevention, CERT leader	Jim	UCSB Emergency Manager. Set up CERT programme to support

			this role. Lead Instructor.
DPC γ	Disaster Prevention, CERT leader	Yoli	City of Santa Barbara Emergency Manager. Set up CERT programme to support this role. Lead Instructor.

Method:	Justification and approach:	Sampling and data collection:	Data analysis:	Bias, ethics and positionality of researcher:
Narrative Inquiry – For CERT and Listos.	Inductive in order to explore issues of understanding, processes and transitions in learners. Informed by participant views. Room for exploration of feelings, values and reasoning.	25-30-minute interviews: 22 from CERT and 16 from Listos. Interviews held at various UCSB offices on campus, Santa Barbara City Fire station and various community locations and offices. Data collection between April-May 2015 and the April-May 2017. Ages 20-64 in both contexts.	Open coding and axial coding. Axial coding initially tested against analytical framework (figure3). Coding opened up to include observations and connections made by respondents to analyse connections.	Identical initial questions. Follow-up questions used to seek further participant clarification or explanation, limiting researcher influence or biasing of responses. Narrative Inquiry allows for respondent perspective to inform. Ethics procedure followed and paperwork completed.
Semi Structured Interviews – Emergency Managers and Trainers of CERT/Listos.	Used to examine learning intentions of programme initiators. To learn viewpoints on efficacy, transformation and sustainability of programme.	Data collection between April-May 2015 and the second between April-May 2017 (Six in total). Included Emergency/Disaster Managers as well as CERT/Listos trainers. Held in Fire Station, Offices of Emergency Management and UCSB Environmental Health.	Context for understanding learning intentions and learning delivery/facilitation through comparing what was said with observations of practice. Extracts were weaved into the texts in empirical chapters.	A more rigid structure applied to questioning during interviews to explore context and intention for learning from different perspectives avoiding researcher influence. Aware that as an educator, temptation might be to assert my perspectives. Ethics as above.
Informal Observations Of CERT and Listos classes.	Informal observations of classes, drills and discussions. This allowed for context and understanding of what respondents reported with what was observed. This strengthens the validity of statements made.	This was primarily of training, classes and drills with BOTH CERT and Listos on two field visits. The first between April-May 2015 and the second between April-May 2017. Classes and drills observed throughout Santa Barbara City and County area at various locales.	Observations were included to support statements or extracts taken from narrative inquiry interviews and analysed in empirical chapters. Photographs taken were also analysed to support findings and assertions.	Some questions asked, but informally over coffee break, etc. This helped to break down barriers to make respondents comfortable in interviews. Aware that observations are subjective and therefore in a supporting methodological role.

A2 Summary of methods developed and applied to investigate TL in the chosen contexts.

