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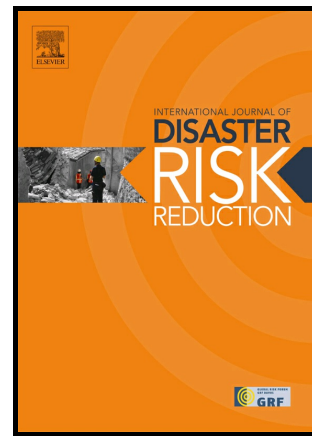
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Understanding and unlocking transformative learning as a method for enabling behaviour change for adaptation and resilience to disaster threats.

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Introduction.

Ongoing threats from disaster provide a reminder that human beings need to find ways of living with uncertainty. Learning to cope with both the threat and the actuality of disasters is a great challenge. Resilience and adaptation to climate change indicate processes of flexibility and adjustment. However, the range of adaptations open to individuals and by extension collectives will be limited in many ways. One important limiting dynamic is associated with capacity to learn, and the depth or superficiality of any learning. This includes the relative capacity individuals hold to deal with the challenges to normality and surprises that disasters bring.

Learning is considered an integral element of the resilience of social-ecological systems and features prominently in influential definitions of the concept (Berkes, Colding and Folke 2003; Folke 2006). Additionally, the development of adaptive capacity is critical to resilience in social-ecological systems (Armitage 2005), where adaptive capacity refers to the aspect of resilience that reflects learning, flexibility to experiment and to adopt novel solutions, including the development of a generalized response to broad classes of challenges (Walker et al. 2002).

Learning is understood here, as being a change in knowledge, beliefs, behaviours or attitudes. (e.g. Ambrose et al, 2010). Transformative learning describes learning that leads to a change in an individual's frame of reference (Mezirow, 1991, 1995, 1996; Cranton, 1994, 1996). These frames of reference are the cognitive building blocks that support deep changes in values, attitudes and associated behaviour that are central to evolving how we respond to living with disaster threats, including climate change. Learning outcomes, including transformative learning outcomes, are strongly influenced by their social context (intended or otherwise) and by the learner's capacity to reflect (Wilkinson, 1999). Learning is also enabled when learners are challenged and given the expertise, knowledge and time for reflection (Maclellan and

Soden, 2003).

Consequently learning outcomes expressed through value and behavioural change are linked to the experience of learning - who learning is shared with, what is being learned and how this is reinforced. This builds from but goes beyond established notions of learning as outcomes of psychological orientation and social context. Central to the argument of the experience of learning influencing learning outcomes, is the degree to which learning opens space for reflection. It is argued here, that having the time, space and opportunity for reflection is more likely to allow the learner to undergo deeper shifts in values and associated behaviour - so called *transformational learning*; and that this opens important space for learning to live with disaster risk and loss.

It is contended that this sort of transformation is critical at all levels of society, including at governmental level. A call for transformational learning, and a recognition for its trans-scalar application arises from the recognition that existing dominant systems of social and economic life are reproducing, and often accelerating the root cause of risk (Blaikie et al, 1994, Pelling, 2011, Klein, 2014). Research in this field that supports this view goes back more than forty years (e.g. Hewitt, 1983; Cannon, 1994; Oliver-Smith, 1996), yet the impact of continued disturbance and shocks brought about through disasters remain. Consequently, this requires learning that can escape from its own social context of institutions, cultures and values, and associated routines and behaviours. It is not surprising that such ambitious learning is met with resistance by dominant institutions; a response that could be argued, is another form of resilience (Pelling and Manuel-Naverrete, 2011). Resistance to change by dint of feeling threatened by new information and emerging knowledge leaders, points of view or scientific research have a long history of automatic responses (e.g. papal responses to scientific treatise) and filibustering in which progress of the wider global community have been stunted by a few elites who have not had the motivation to acknowledge or question such responses.

Furthermore, resilience as a concept has emerged from its use and development in wide ranging disciplines that include ecosystem stability (Holling, 1973; Gunderson, 2009), engineering infrastructure (Tierney and Bruneau, 2007), psychology (Lee et

al., 2009), the behavioural sciences (Norris, 2011) and disaster risk reduction (Cutter et al., 2008). This wide use has led to critiques of its efficacy in leading to transformed communities that “can bounce” forward rather than returning to the status quo following disasters (Manyena, 2009, 2011). The aspects of resilience that I wish to explore here, is more closely linked with the 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). By placing learning at the heart of adaptive capacity allows for flexibility of thought, reflection and an ability to transform practices that are able to react more positively to change.

However, current resilience thinking and specifically recent application of Social Ecological Systems (SES) understands resilience, as systems functioning through disturbance. This presents a central problem – how to make fundamental change to deeply unsustainable and unjust systems through a resilience lens that seeks to promote the persistence of core systems functions? If we think about the future in terms of the persistence of core systems functions this directs and constrains innovation of thought, practice and action in ways that can block movement towards sustainable and just development. Bringing transformative learning inside conception of resilience helps to open conceptual and policy space for deep reflection and to move the juggernaut of public policy from reducing risk to protect development – to questioning the root causes of risk that lie in dominant development pathways.

Yet these messages are not getting through to governments who it has been argued govern... “with their eyes on the rear-view mirror”, (Mulgan, 2006 p.306) meaning that governmental response to disasters are sometimes more influenced by political, ideologies and how they are perceived by economic and political elites and less by taking allowing time for reflection and learning from crises and the shocks that extreme events can pose. Unless embedded practices are challenged and open to being transformed, it is hard to see how progress towards sustainable futures might be made.

The following sections introduce transformative learning, propose a visual model for enabling learners to understand how the process of transformational learning might

unfold and then highlights critical reflection as key to confronting some of the wicked problems that humanitarian disasters, inclusive of climate change, pose.

Transformative Learning

Transformative Learning (Mezirow, 1991, 1995, 1996; Cranton, 1994, 1996) is that which leads to a change in an individual's frame of reference. Frames of reference can be identified 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). Such frames of reference can result in a strong tendency to reject ideas that fail to fit an individual's preconceptions, leading them to be dismissed as irrelevant or wrong.

This may go some way to explaining why some choose not to address threats posed by disaster risk - doing so may challenge deeply held assumptions about life and identity. It is posited that transformative learning allows learners open experiences that enable new, difficult or challenging frames of references to be accommodated, and not denied (Hulme, 2009).

Consequently, Transformative Learning (TL) allows learners to question their assumptions, both current and prior, which then have the potential to change as a result of experience. Mezirow and Taylor suggests that it is teaching for change (Mezirow and Taylor, 2009), while Armitage et al. (2008), notes Mezirow's suggestion 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).

In terms of its roots and development, TL theory has taken on many influences during its development over the past 40 years. According to Kitchenham, (2008), this includes Kuhn's work on paradigms (Kuhn, 1962), Freire's theory of conscientisation (Freire, 1970) and Habermas's domains of learning (Habermas, 1971; 1984). However, critically for a theory of learning that seeks to engage learners in new paradigms, a visual representation of the theory as a process is not readily available or over-simplifies the process so that important nuances of learning are overlooked (e.g. Nerstrom, 2013).

Such visualisations may be important to learners and to those wishing to facilitate it, because the learning effectiveness of an individual may be impacted differently depending upon the media and medium used for delivery. This goes beyond simple catering to learning styles, towards having an awareness of meta-cognition that allows for self-reflection, evaluation and correction and before epistemic learning practices, such as TL, allow the learner to think about their own, “frameworks, or worldviews which provide the context or perspective through which we are learning about learning and learning about the matter at hand” (Bawden, 1997a, p. 27). Moreover, Bawden (1997b) alludes to epistemic learning as that which allows the learner to learn how to challenge and change worldviews and paradigms, including dominant ones of “reductionism, determinism, autonomous individualism and materialism” (after Vitz, 1996). If dominant views described by Vitz (1996) are to be challenged by new learning or consciousness, then TL brings together those learning approaches that have this as their aim or within their scope of aspiration.

The next section attempts to clearly show what might be expected to occur as part of the TL process, dealing with the parts of the practice that take place consciously and unconsciously and offering ways to view the process at a glance, in an attempt to simplify the understanding of the process.

Why a visual model of TL?

The visualisation model proposed here (figure one) was developed with the intention of providing a starting point for engaging with Non-Governmental Organisations (NGO’s) who were struggling with the concept of organizational learning, but with whom I would be engaging in research interviews as part of my PhD research. The visualisation model was presented to NGO’s attending workshops, as a way of helping them understand how TL might be used to unlock learning that transformed their practices in relation to disaster resilience programmes. The overall focus of my PhD research is an investigation into the extent to which transformational learning is able to change cognition and behaviour concerning adaptation and resilience towards disaster risk. One strand of the empirical research involves working with NGO’s seeking to transform their practice in the field of disaster resilience.

Working with NGO's involved in disaster risk reduction, resilience and climate change provides a useful baseline for understanding the depth and fixity of transformation in organisations in which individual practitioners are open to change but the wider organisation may provide resistance or barriers. By carrying out interviews with these practitioners provides an opportunity to understand how learning is undertaken, how it is negotiated and how challenges overcome (including the strategies used to do so). Through these interviews a range of viewpoints and ways of working can be accrued to assess the relative impacts of flexibility of thought, deemed to be a hallmark of perspective transformation, which in turn is a central component to changing attitudes and/or behaviour that has the potential to result in a different form of action. This is particularly relevant to humanitarian NGO's whose focus is often response led, with limited time and space for reflection.

By allowing *prospective* learners (including those from NGO's that I wished to carry out research with) to view the visualisation model of the TL process it was thought that it might:

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- Appear less overwhelming or intimidating as each phase is clearly described.
 - Allow for a feeling of solidarity and understanding for the feelings and views of others who are going through now, or may go through in future, the same phases and challenges as part of TL.
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A further reason for developing the model and sharing with individuals charged with learning within their organisations is to address some of the criticisms (e.g. Taylor and Cranton, 2013) about TL research being primarily retrospective and focusing on interviews with individuals who have already gone through the process of TL.

A Visual Model: what it means for understanding transformative learning.

In the visualisation of the TL process (figure 1) there are several phases shown that are said to be required in order for existing frames of references to be challenged and accommodated in a new schema of understanding that brings about changes in intention, behaviour or action (Mezirow, 1991, 1995, 1996; Cranton, 1994, 1996).

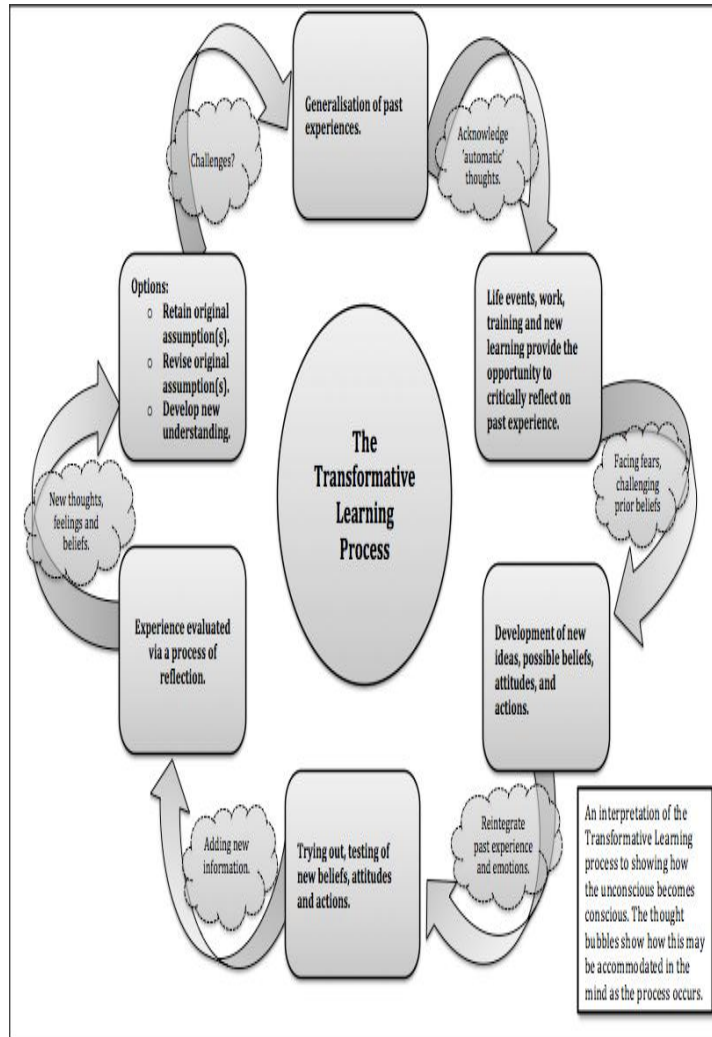


Figure 1: The Transformational Learning Process (Sharpe, 2015a,b)

The visualisation draws heavily on the phases of TL described by Mezirow (2000) alongside the processes and outcomes described by Taylor (2013), Cranton (1994, 1996) and others. This particular representation also recognises that unconscious thought and cognitive processing are as important as the critical reflective processes required for true transformation of thoughts, beliefs and intentions revealed in current or future practice or actions. These are represented in figure one by thought bubbles in which unconscious thoughts allow processing and reflection both when directly engaged in learning but also in quieter moments away from stimulus, experience or activity.

It is argued that these moments and periods of unconscious thought may provide buffers and connections to the more recognised and formal phases of transformative learning, while occurring discretely throughout the process. By allowing learners to acknowledge the impact of unconscious thought in *blocking* learning pathways (Cranton, 2006) it paves the way for the TL journey to commence. By providing a visualisation of the unconscious in Figure 1 it may make this idea less abstract and more concrete – it is there on the page to be viewed, thought about and assimilated! When engaging with NGO's in TL workshops, I have also found it to be useful to have an A0 size poster with blank Post-It notes scattered around so that the viewer may add comments or ask questions, bringing the model into the real world rather than existing on a slide within a PowerPoint presentation.

In order to help those new to the theory of TL not be confused by the first phase of the process, *generalisation of past experiences*¹ is substituted for what Mezirow (1991; 1995; 1996) calls frames of reference in order to simplify the model/process for learners, although the meaning is intended to be the same. These generalisations of past experience purposely indicate minimal reflection but also recognise that they exist as memories borne from that experience. These memories may also have become embedded via repetition of a task or way of doing something so that it becomes reflexive rather than reflective. In other words, habits of mind also produce habits of action or repetition, which can lead to stasis and a lack of innovation, all the while being defended in the mind as: “We have always done it like this”. If there is

¹ Italics are used in this section to denote the various phases of transformative learning as shown in the framework/visualisation in figure 1.

little reason (in the mind of the individual) to change practice because they have not been challenged by new experience then it is unlikely to change. Consequently, the unconscious mind provides a stream of ‘automatic thoughts’ which when linked to memory and past practice forms a strong connection to belief in one’s intentions, behaviours and actions.

This presents a particular challenge to those seeking to engage individuals in thinking about potential consequences of disasters (including climate change), because individuals may, for example, field a number of automatic thoughts in order to deflect examination of their patterns of consumption, transport and energy use or disaster preparedness. Furthermore, cultural lenses including religious background and beliefs, influences from friends and family and political affiliations may inhibit their self-efficacy in bringing about change. These are all encompassed in the original models of transformative learning as individual *frames of reference* (here represented by generalisation of past experiences) which when altered is said to lead to transformative learning (Mezirow, 1991, 1995, 1996; Cranton, 1994, 1996).

Furthermore, such frames of reference can result in a strong tendency to reject ideas that fail to fit an individual’s preconceptions, leading them to be dismissed as irrelevant or wrong. This may go some way to explaining why some choose not to address threats posed disaster risk, as doing so may lead to discomfort. However, TL has the potential to *challenge previously held beliefs via life events, work-based training or independent learning*, in the next phase. In particular, certain life events may well come as a shock or series of shocks that remove the individual from his/her comfort zone and cause them to question previously held beliefs, ways of doing something or actions. This change in awareness or awakening is central to what Homer-Dixon advocates as the adoption of the prospective mind that is, “grounded in the knowledge that constant surprise and change are now inevitable” (Homer-Dixon, 2006 p.29)

Critical reflection is significant to the examination of fears, challenges and prior beliefs that previously were initiated as *unconscious responses* to perceived threats to modes of living, working etc. Confronting these problems through new learning experiences may be easier to cope with if experiences are shared with others

undergoing similar transitions. Therefore TL is also a socially constructed experience and one in which sharing in the recognition and negotiation of emotional responses may allow for new learning and change to feel less intimidating. By encouraging learners to share their fears, concerns or perceived barriers they will start to consciously process these and be able to start to formulate new ideas, beliefs, attitudes, intentions and actions to respond to the problem facing them. This is important for developing what Bandura referred to as ‘requisite competencies’ (Bandura, 2000 p.75) or ways of doing things that are only negotiated when faced with barriers that force the development of new ways of thinking or skillsets that would not be developed by non-engagement with a problem.

This also helps to develop efficacy at the personal level. This is known as self-efficacy (belief in one’s ability to do something) and if shared and experienced by a wider group this may also lead to group efficacy. The development of group-efficacy is also supported in a resilience context by Homer-Dixon (2006) who suggests that a collective mind would help make our societies – and each other - more resilient to external shock and more supple in response to rapid change (Homer-Dixon 2006, p30). Moreover, when collective learning is socially constructed and shared within safe confines of a group it conceivably makes it easier to *try out, test and formulate new ideas and beliefs*, especially if learners trust each other (e.g. Brown and Posner, 2001).

New information and experiences from others may also allow novel perspectives to be communicated and shared for consideration. This does not mean that this knowledge or experience is automatically accepted by all of the learners; but it is more likely to be accepted if this new knowledge comes from a trusted source. This all adds into the processing of new information, which may occur in moments of critical reflection where experiences (including vicarious ones told and shared by others) are evaluated.

However this is a complex process that may occur quicker for some than others, not least because of the strength of original frames of reference or generalisations of past experiences which are coloured to a lesser or greater degree by a wide range of cultural lenses and ethical considerations. Nevertheless if these thoughts and

experiences are given context and deeper consideration it is possible for them to be included in the formation of *new thoughts, feelings, beliefs, intention and actions* that may lead to the following learning scenarios:

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- A. Retention of the original assumptions.
 - B. A revision of the original assumption.
 - C. A development of new understanding.
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In terms of TL, a reverse order of the list above would be most desirable in terms of evolving learning, which has come from new information, experiences or ways of doing things, as the learner adapts their modes of thinking (both conscious and unconscious) to be reflective rather than reflexive leading to a *new understanding of the problem* (C, in the list above). This is the most radical form of learning, which may result in what Freire (1970) termed conscientisation. However revising original assumptions about a problem and written about in more detail below is a key underpinning of the cognition process required to unlock this new understanding.

Consequently, if the learner *revises his/her original assumption* regarding a problem (B, in the list above) this is likely to lead to strong feelings of belief in the validity of their newly learned, tested and reflected upon argument, position or way of doing something. This is extremely important in the development of self-efficacy beliefs (Bandura, 1986). It is believed that this construct influences the accomplishments and choices that individuals make in deciding what can and cannot be achieved. This is significant in disaster resilience contexts when the problems may appear overwhelming. Hence if TL processes can help nurture the development of self-efficacy beliefs, individuals and groups may learn to overcome obstacles and demonstrate resilience to unexpected events. In other words: their ability to cope with uncertainty, shocks and change is increased when their self-efficacy beliefs are well developed.

Conversely a lack of self-efficacy belief lowers confidence in an individual's ability to achieve and the perception is that tasks are more difficult. Pajares (2002) argued that this creates stress and narrow vision of how to best solve the problem. The role

that TL plays here is by encouraging learners to recognise that such thoughts are automatic responses rather than considered ones (see figure one). This requires the development of critical thinking and reflection in order for self-efficacy to develop via testing and trying out new ways of thinking about a problem. Bandura (1986) suggests that, "persons with a strong sense of efficacy deploy their attention and effort to the demands of the situation and are spurred by obstacles to greater effort" (Bandura, 1986, p. 394). Therefore, when a *revision of original assumptions* occurs, they bring with it a deep level of accomplishment learned via the development of requisite competencies. These requisite competencies are ways of tackling obstacles or problems inherent in the development of self-efficacy beliefs. This is also a key underpinning for TL.

Finally, the least desirable outcome of TL would be the *retention of original assumptions* (A, in the list above). If original assumptions are retained, this suggests a cognitive resistance to the acknowledgment of problem, which has persisted throughout the TL process. This is a possible scenario if a learner decides to take a dogmatic position and only relates from their own world-view, dismissing other experiences or emotions as invalid. It also unlikely that such an individual would be seeking out new information, ways of doing something or learning in the first place. However, by dint of an individual learning alongside others, it may lead to challenges being made to those world-views too. The addition of alternative perspectives might result in their original assumptions changing over time and indeed long after the learning has taken place as new experiences, challenges and temporality enables deeper reflection to occur. Therefore *critical reflection* is highlighted as the most important part of the process of TL and understanding how to initiate it may be key to unlocking all of the phases described as part of the original model as well as the visualisation offered here.

TL and the importance of critical reflection in adaptation and resilience contexts

The previous section illustrated that TL should not to be an abstract concept understood by a few and practiced and/or facilitated by fewer. It has the potential to unlock critical reflection and questioning of practices that are unsustainable and add to the vulnerability of those at risk from disasters. The idea of reflectivity is not new

and is seen as crucial to making sense of experiential learning (e.g. Dewey, 1938; Kolb, 1984); social learning (e.g. Bandura (1977) as well as transformative learning (e.g. Mezirow 1995, 1996, 2000). However a key challenge remains regarding how critical reflection can be effectively included as part of the learning process with limited time and funding and when the *idea* of response to disaster events is more seductive than perhaps the *ideal* response.

A useful example is provided by examining government responses following flooding in the UK in 2007 and 2014. In 2007 widespread flooding occurred across large swathes of the UK, affecting large numbers of people in urban areas including Hull, where 90% of inhabited land lies below the high tide level and with large areas built on reclaimed marshland. In total 55,000 properties were flooded across the UK, with 7,000 people affected while sadly, 13 people lost their lives (Pitt Review, 2007). Additionally, nearly 500,000 people were left without water or electricity and the insurance bill was expected to be more than £3 billion. The Pitt Review of Flooding (2007) was initiated in an effort to learn lessons from the event and to improve flood mitigation in light of future events. The review examined the floods from a number of perspectives, with input from traditional agencies as well as from those affected and disaster risk reduction experts. A total of 92 recommendations were put forward including: prediction and warning of floods, flood prevention, emergency management, resilience and recovery. The government's final response to the Pitt Review in 2012 stated: "Many of the recommendations were far-reaching and called for a radical reshaping of flood risk management practice" (DEFRA, 2012. p.4). Despite the radical nature of the recommendations, the government reported that 83 recommendations had been implemented with six on going (DEFRA, 2012).

Consequently, the government response to commission the Pitt Review allowed for a period of critical reflection, a re-evaluation of practices and a series of comprehensive recommendations, which were largely implemented by government over time. Critical reflection included: how the floods impacted individuals and businesses, the various agencies charged with managing watercourses, sewerage and drinking systems and those who responded to the largest civil emergency since the Second World War (Pitt Review, 2007).

It could be argued that these socially constructed experiences allowed for perspective transformation because time, space and funding were given over to a comprehensive period of critical reflection and consultation. This is crucial when seeking to unlock wider transformation of practice and is fundamental to tackling wicked problems, including climate change. However, despite providing an example of the gains to be made through critical reflection guided by TL, it is not always identified or applied. The following example show how these gains can be undermined through political short-termism coupled with what I have already characterised as the idea of response, rather than the ideal one. It provides an example of what the TL model calls 'automatic responses'.

In the winter of 2013/14 there was again widespread flooding across the UK but much of the focus of government centred on the Somerset Levels, in southwest England. Local landowners, including farmers, blamed the floods on a lack of river dredging and were vocal about this during national TV and radio reports. As a consequence, the English Environment Agency produced a leaflet on outlining arguments on why dredging was not the answer (Environment Agency, 2014a) but media and political pressure brought about a promise of extra funding which led to targeted dredging in the area (Environment Agency, 2014b).

This particular event highlighted a shift in flood response from technical and managerial modes informed by evolving practice through critical reflective learning, to political ones, played out in the 24 hour news cycle, supported by footage and photographs of land under water. This led to public debate and inclusion in national politics with both the dredging and the finances to pay for it, hastily made available and announced by the Prime Minister. This response illustrates a marked contrast to the 2007 flooding that led to widespread managerial change (via the Pitt Review) but not to statements by the Prime Minister in response to media and political pressure in 2014.

This lack of critical reflection has implications for future adaptation and resilience building when one of the key stakeholders in hydrological management avoids scrutiny of their practices. The 2014 flooding of the Somerset Levels provides an

example of what might be considered automatic response exhibited by landowners, including farmers. In their frustration at both the situation and their perception of inaction by the Environment Agency, blame for flooding was laid at the government's door. However critical reflection was absent in a number of areas, with the perceived rapid response and call to action overriding longer-term views surrounding causation and appropriate measure that might be taken. As farmers and landowners went on the offensive in the media, laying blame for flooding on lack of dredging, it neatly deflected questions regarding their own practices, allowing them to be perceived as victims rather than actors playing a key role in increasing the vulnerability of those on the flood plain. Thorne (2014) suggests that a cocktail of market forces, incentives and food security concerns drive rural land use management decisions that increase flood risk. In particular he points out that a recent: "trends towards conversion of grassland to arable crops, production of forage maize, high animal stocking densities and use of heavy equipment during wet conditions justify these concerns." (Thorne, 2014, p.302) These practices are known to produce increased soil degradation and runoff, which increases the need for dredging. Consequently, the assumptions of landowners and farmers regarding the causes of flooding (local and global) went largely unchallenged, which doesn't help address what will happen when floods occur again. And action at the local scale, when scaled up across a region or country does have a wider trans-boundary impact.

It is argued that engaging with more holistic approaches, including TL, may lead to more open dialogue between stakeholders at all levels, including groups, communities, professional bodies and governments. This view is supported by previous research outlining the role of stakeholder participation in facilitating learning that includes critical reflection among participants (Cundill 2010; Diduck 2004, Gerger-Swartling et al. 2015). Key to this participation is the development of established mechanisms and opportunities for all members to meaningfully contribute their knowledge and experience to the learning. This can and should include the development and facilitation of inclusivity and learning that respects the experience and knowledge of all parties before carefully considering or *reflecting* upon them (Sharpe et al, 2016). This reflection is significant to cognising experiences and fitting them within a schema of understanding. It can also allow for the sense making processing of new experiences (even in the light of shocks, unexpected events or

outcomes).

Furthermore, learning to reflect upon one's own thoughts, automatic responses and ways of thinking may have further benefits to enabling community resilience. Scott's (1991) research on the transformative experience of community organisers found that when the needs of the ego (a person's sense of self-esteem or self-importance) are transcended through participation, this engenders a better understanding and empathy for the needs of the collective, whilst also allowing for a group to develop, which can 'serve to represent symbolically alternative thoughts, structure, directions, and images for what is appropriate in today's society' (Scott, 1991 p. 240). Taylor (2002) also cites studies that provide insight beyond an ego-centred motivation that allows for the inclusion of spirituality and transpersonal realms of development alongside compassion for others, which can lead to a new connectedness with others.

Having views challenged, which is a stimulus that can awaken feelings of empathy and engender respect for the knowledge and opinions of others, may have benefits that go beyond community activism. As disaster risk inclusive of climate change remains both a real and present danger, TL that unlocks these useful psycho-social skills contributes to allowing disengaged communities to take up reasoned discourse and analysis of these dangers.

Conclusion

This paper supports existing argument that learning is key to enabling adaptation and resilience to disasters including climate change, while recognising that the superficiality or depth of this learning impacts on its effectiveness at bringing about transformation of attitudes, values and behaviours. It was posited that a need for transformational learning has arisen from recognising that existing dominant systems of social and economic life are reproducing, and often accelerating the root cause of risk. This includes social contexts and pathways for learning.

Therefore new ways of approaching learning are required to help break-out of established ways of thinking and tackling problems. TL provides a means of achieving this. TL helps to open conceptual and policy spaces for deep reflection; allowing public policy to move away from reducing risk to protect development – to

questioning the root causes of risk that lie in dominant development pathways.

The concept of a TL process model was introduced to enable a better understanding of what TL entails by showing its constituent parts and how they relate to each other. This included both the conscious and the sub-conscious, which is important for recognising the influence of automatic thoughts that might lead to a dismissal of new or challenging ways of doing something, stifling innovation at times of stress, such as when disasters occur. Ongoing critical reflection throughout and beyond the initial learning opportunity was highlighted as key to unlocking true transformation while recognising that this can be undermined if political decisions fail to tackle the root causes of a problem, as illustrated in the comparative responses to two flood events in England. In these examples, one was inclusive, holistic and transformative, the other was exclusive, insular and potentially more damaging as automatic thoughts and responses played out through the media took precedence over critical reflection. These examples illustrated the dichotomy of response in dealing with wicked problems, such as threats and impacts from disasters, including climate change, might also be viewed as an opportunity to learn. However, the depth of learning and the extent that it initiates transformation varies. By providing an explanation of TL, illustrated by the visual model proposed here and applied to disaster adaptation and resilient concepts, it opens the door to alternative ways of thinking about and understanding the complexities of the root causes of disasters.

Returning to the issue of climate change, its trans-boundary nature means that it has the ability to affect everyone. However it is also recognised that impacts will be more keenly felt by developing nations which allows those living in wealthier nations to position the problem as part of the 'other' and not insert themselves, their behaviours and actions as being either contributory to the problem or part of the solution. This occurs despite a wealth of media coverage informed in part by scientific, economic and social literature used to build an evidence base and raise awareness. However, while acceptance of climate change is one thing, changing the attitudes, intentions and behaviours of individuals is not readily achieved solely by the acquisition and sharing of new knowledge or acceptance of a perspective alone. This is where TL has a role to play in allowing individuals, groups and communities to undergo deeper questioning of practices and habits of mind as part of a wider conscientisation (Freire, 1970) that

includes the ‘other’ through empathetic understanding, critical reflection and positive actions. The changes that TL can bring are not merely desirable; they are essential for the evolution of our response, adaptation and resilience to disaster risk.

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