

Abstract

It is a concern that children represent an under-researched group in flood education and preparedness because as adults they are more likely to experience flooding as the climate changes, and because it suggests their potential today, as agents of change, is being undervalued. Using action-based, participatory methodology with 7-9 year old children, a creative and inclusive flood education resource was developed as a stimulus for learning. Evaluation revealed that young children can learn about flooding and preparedness, and that intergenerational learning from child to parent can also occur, with children transferring the messages learned in school to home. However, thematic analysis suggests a number of key factors such as family relationships (empowerment of children) and the parents' disconnection and dissociation from risk limit the success of intergenerational learning. The implications of these in relation to flood education, flood preparedness and household resilience levels are explored.

Keywords: children, flood vulnerability, flood preparation, household resilience, flood education, intergenerational learning, participatory method.

Introduction

In the global shift towards devolved responsibility for flood risk management, there is an imperative for increased household involvement in local resilience building (Johnson & Priest, 2008; Butler & Pidgeon, 2011). A principal driver in this policy change has been acknowledgement of the economic and technical limitations of structural flood defences as the sole solution, given longer-term climate change and projected increased flood exposure (Nye, Tapsell & Twigger-Ross, 2011; Begg, Walker & Kuhlicke, 2015). Emphasis is consequently being placed on 'learning to live with floods', including developing a broader range of engagement approaches, as well as adaptation measures at the community and household levels (Geaves & Penning-Rowsell, 2016).

Research focused on effectively communicating climate change identifies children and young people as an under-represented group (Corner et al., 2015). Furthermore, none of the UK government guidance to families at flood risk promotes the involvement of children. This is the case despite research suggesting that the inclusion of children in flood plan formation and implementation may mean that the impact on children experiencing a flood is not as

devastating (Peek, 2008; Whittle, Walker, Medd & Mort, 2012), or isolating as it could be (Vogel & Vernberg, 1993). Involving children directly in developing household resilience planning might also have logistical advantages. For example, older children could be responsible for implementing a flood plan if adults are out at work or are unable to get home due to floodwaters. There is also evidence that beneficial outcomes can occur because children exchange knowledge and understanding with parents and older family members. The value of this reverse intergenerational learning has been illustrated in Education for Sustainable Development (ESD) initiatives (Ballantyne, Connell & Fien, 1998, 2001; Ballantyne, Fien & Packer, 2006) but less so in the context of environmental risk.

In contrast, children, and particularly young children, are often seen solely as a 'vulnerable group' in risk planning (Norris et al., 2002), thereby under-valuing their potential as proactive and effective agents in achieving resilience. Clearly there is an unexplored potential for younger family members to have a greater role in building household resilience to risk. Equally there is value in assessing whether intergenerational learning could be an effective strategy for, and mechanism in, improving local resilience.

This paper addresses these questions in relation to a group of young children (aged 7-9 years) and their families, through evaluating the impact of a novel participatory methodology. The aims were (i) to evaluate the impact of a specific creative intervention on children's learning and subsequent agency in flood preparedness within the household, and (ii) to explore the potential of young children to educate and affect change within their families and communities through inter-generational and inter-community learning.

The literature review addresses themes of children, flood risk education, vulnerability and preparedness and draws across international research in geography, psychology, sociology and education to explore children as catalysts for change and intergenerational learning. This highlights the need for interdisciplinarity in both theoretical and empirical work and positions the conceptual framing for the research. The methodology section presents the multi-method approach, including participatory activities and semi-structured interviews with children, and subsequent semi-structured telephone interviews with parents/carers. This is followed by thematic analysis of the data, accompanied by an assessment of its implications for research, practice and further investigation.

Literature Review

Children, vulnerability and preparedness

Peek (2008, p1) emphasised the vulnerabilities and increased psychological and emotional risks to children during disasters, concluding that ‘in order to promote children’s resilience in this setting, we must improve their access to resources and empower them by encouraging their participation’, crucially recognising and encouraging the potential and distinctive contribution children can make to disaster preparedness. For households who live in flood risk areas, a key element of the UK environmental regulators’ (Environment Agency (EA), Scottish Environment Protection Agency (SEPA) and Natural Resources Wales (NRW) guidance to residents is to be prepared including having a household flood plan. Similar approaches are also promoted by the US Department of Homeland Security (FEMA), and Emergency Management Australia (EMA). Evidence suggests that the link (adaptive learning) between flood experience and action is weak (Wachinger, Renn, Begg & Kuhlicke, 2013). This imperative poses questions about the roles of different family members in terms of ‘learning for resilience’, with children representing a key (Norris et al., 2002) but under-researched group (Haynes & Tanner, 2015; Corner et al., 2015).

Learning for Resilience

A growing number of initiatives are focussed on engaging younger people in learning about flooding, and the importance of ‘being prepared’ (Table 1; see <http://www1.uwe.ac.uk/et/research/cfcr> for a more detailed version). These range from creative projects co-working within the arts, through to technology-based learning programmes, at national and international scales. However these efforts in linking research, practice and social learning are currently disjointed, uncoordinated, and the impact of learning interventions is rarely evaluated with limited sharing of feedback. For children and young people (and everyone), methods involved in learning make a difference to how deep and actionable learning is (Davies et al., 2012). Using active participatory and inclusive methodologies with creative stimuli could mean that children engage more positively with a topic that could otherwise be thought of as upsetting, remote (e.g. technology mediated), or dry (through one-way delivery of information).

[Insert table 1]

Some flood education and prevention interventions contain a degree of evaluation, but urgent synthesis is required to evaluate relative effectiveness and ensure credibility and value in local application. In a content analysis of three websites (included in Table 1) containing preparedness materials for children, Ryan, Hocke & Hilyard . (2012, p300), discuss their limitations, emphasizing that ‘using fear appeals to emphasize severity and susceptibility, which may unintentionally trigger fear control responses in children rather than preparedness behaviour’. In a review of methodologies (in 35 studies) in disaster education programs, Johnson, Ronan, Johnston & Peace (2014), highlighted limitations including an over-emphasis on knowledge acquisition, and the gap in research concerning children’s role in their families and communities, concluding that it is important to pay attention to the affective domain and potential behavioural changes alongside cognitive factors when addressing an emotive subject such as flooding and being flooded.

In the aftermath of the July 2007 floods in North East England (Hull), UK, Whittle, Walker & Medd (2011), designed a specially commissioned suitcase aimed at children aged 11-14 years. This was designed to act as an educational resource that could be used to stimulate learning about the importance of being prepared for events such as flooding. Although no formal evaluation was completed, the authors emphasised the creativity and physicality of the suitcase and reported on its usefulness in dissemination in a range of settings. SEPA has also produced a range of creative resources to support learning about flooding and preparedness in schools with 9-10 year olds (see SEPA website). Working with flood affected children after the 2007 floods in Hull (UK), Walker et al., (2012, p8) found that children can recover quicker both practically and emotionally when they ‘have some involvement in the repairs and recovery process, such as being included in family discussions or providing practical help’. In the Australian literature, the successful inclusion of evaluated natural hazard education in schools is emphasized (Dufty, 2009). To date, there are no similar resources in the UK that target a younger age group who may benefit cognitively from more participatory and creative stimuli that engage a range of learning styles.

Intergenerational learning

The UN Convention on the Rights of the Child states that ‘children’s perspective should be taken on all things that affect them’ stressing that they are active, competent agents, have responsibilities, and can be influential in families and communities

(<http://www.unicef.org/crc/>). United Nations International Children's Emergency Fund

(UNICEF) advocate working with children with a developmental approach to education in emergencies, stressing children's future role as environmental stewards (Pigozzi, 1999). Furthermore the Sendai Framework 2015-2030 suggests 'Children and Youth are agents of change who should be given the space and modalities to contribute to disaster reduction'. Children's potential to act as catalysts for change has been explored in environmental education (EE) research (Ballantyne et al, 1998, 2006; Connell, Fien, Lee, Sykes & Yencken, 1999), and a focus on children's learning through formal education is a key policy strategy in building resilience in communities in some Less Economically Developed Countries (Izadkhah & Hosseini, 2005), such as Costa Rica (Vaughan, Gack, Solorazano & Ray, 2003), El Salvador and the Philippines (Tanner, 2010). Here the messages can be fully expected to be transferred to parents and communities, resulting in valuable intergenerational and inter-community learning. Cultural issues can inhibit this strategy however. For example, research with children in Java, Indonesia suggests that they feel unable to influence their parents /communities (Prabawa-Sear, 2015). In the UK, there are fewer examples of this being strategic policy, with children often absent in formal and co-curricular learning around preparedness for environmental hazards (Mitchell, Haynes, Hall, Choong & Oven, 2008).

Through intergenerational and inter-community learning, there is potential for deeper and broader learning and for information to reach more people, thereby having greater impact. Traditional models of learning assume older generations teach younger, but there is increasing evidence from a range of practices that this relationship can work just as well in reverse, for example with technology (Baily, 2009), in business management fields (Chaudhuri & Ghosh, 2011), and in health education (Abraham, Sheeran & Johnston, 1998). Reversing this traditional model of learning and allowing younger generations to teach and exchange knowledge, influence and mentor can break down barriers in communication and aid learning. Intergenerational learning has been the focus of Education for Sustainable Development (ESD) for some time (Brundtland et al., 1987; Tilbury, 2004; Strachan, 2014), as well as to some extent within local environmental management education (Uzell, 1999; Ballantyne et al., 1998; Vaughan et al., 2003), and environmental education research (Sutherland & Ham, 1992; Duvall & Zint, 2007). In the hazard preparedness literature, young children's voices and the potential for inter-generational learning is yet to be explored fully (Haynes & Tanner, 2015).

Research indicates that family relationships and children's positioning within the wider community can be a crucial predictor of their potential influence. For example in Costa

Rica, importance is placed on environmental education which is focused on children as the main target group with the full expectation that adults will learn from the children. Here investing in children is prioritised by educators because ‘children constitute a captive audience, represent future environmental stewards, and are more easily taught and influenced than adults’ (Vaughan et al., 2003, p13). Vaughan et al. (2003) revealed a longer term improvement in knowledge by the children, their parents and a control group, suggesting that intergenerational and inter-community learning had taken place and persisted as a result of what children learnt. Peek’s (2008) review of research in Less Economically Developed Countries further suggests a link between resilient communities and educating children about disaster and risk.

Ballantyne et al. (1998) propose that a key factor to successful intergenerational learning is the reported strength of pre-existing relationships between children and their parents. Similarly, Istead and Shapiro (2014) focused on exploring child-adult learning from the perspectives of five children and their mothers through a series of in-depth interviews. When children were confident and secure in their relationships with their mothers, they reported a high degree of potential influence over their parents. However, it could be argued that families with a less strong or secure pre-existing relationship may find that having their children talk to them about what they have learned, or taking part in educational programmes together could strengthen their relationship, as well as increase their mutual knowledge and preparedness.

Theoretical Framing

In developing a theoretical framework to explore these empirical research findings, its’ dual focus necessitates the drawing on both educational and psychological theories as well as disaster preparedness theories. With roots in experiential learning theory (Kolb, 1985, 2014), active learning theory (Hart, 2013) informs our methodology, and can be applied to explain how children learn through the experience of engaging in a novel, creative participatory event (as used in this research). Transformative learning theory (Mezirow, 1997) could explain cases where rapid learning and/or behaviour change occur, (Percy-Smith and Burns, 2013). By exploring parental views about their children’s attempts to transfer learning to them, we can begin to understand more about the factors that influence successful intergenerational learning and its potential to increase preparedness behaviour.

Social cognitive theories (Bandura, 1986; Paton, 2003) aid theoretical exploration, and have been used in research concerning preparedness (Paton, 2003; Becker, Paton, Johnston, Ronan, 2012). A range of theoretical models (including Transtheoretical Model, Theory of Planned Behaviour and Protection Motivation Theory) are discussed in relation to emergency preparedness by Paek, Hilyard, Freimuth, Barge & Mindlin, (2010).

Methodology

Taking a ‘new sociology of childhood’ approach to avoid tokenistic participation and make efforts to conduct research *with* children rather than *on* children (Green, 2015; Barrat-Hacking, 2013), this research is informed by participatory methodological theory. Guided by Shier’s (2001) 5-stage model, three principles underpin the participatory nature (Pain & Francis, 2003) of this research. Firstly, the children involved should be active participants in both their involvement as participants in research and also as beneficiaries of an effective learning experience. Secondly the children should be recognised as a group who can affect change through the research process and contribute to action for climate change. Thirdly, the children are involved in the development of the research stimuli which are carefully designed to be inclusive, active, informative and creative.

The complex nature of the research gave children the opportunity to act as agents of change within their families and communities. Participatory methodological theory can go some way to allowing this opportunity but there is not a ‘one size fits all’ template, and as such, innovation is needed in the research design (Groundwater-Smith, Dockett & Bottrell, 2015). That innovation involved skill from the researcher to create a research environment that was both active and participatory for the children, and generated a feeling of empowerment and ownership over the research process (Groundwater-Smith et al, 2015).

Design issues and process

Working in a school requires a great degree of flexibility and communication between the head teacher, the class teacher and the researcher in terms of scope and space for learning (Greig, Taylor & MacKay, 2012; Groundwater-Smith et al., 2015). Consultation with the children was initiated at the start of the research process by the researcher being introduced by the class teacher and spending time in the classroom. This early longitudinal engagement

was critical to the research process. Table 2 details the critical information about the different stages of the research.

[Insert table 2]

[Insert table 3]

Sixty-eight children from two schools identified as at flood risk participated in the study (see Table 3), with both located in deprived areas (Index of Multiple Deprivation, 2104). Data collection occurred in three phases each of which were tested with a small group of children in a home setting before the final roll-out. Phase 1 included children working with the researcher in school in small groups on a co-curricular activity facilitated by a PowerPoint presentation constructed by the researcher and informed by guidance from the environmental regulator (UK Environment Agency, EA) providing local and global examples of flooding which emphasised the importance of ‘being prepared’. The children made a ‘treasure box’, which acted as a surrogate for a ‘grab bag’ or a flood box, which was taken home. Previous interactive work with children (Williams, Wright & Freeman, 2002) underpinned development of the ‘treasure box’ intervention, ensuring research tools were innovative and interesting, resulting in engaged children (Ballantyne et al., 1998). This activity was participatory and creative, and involved children decorating a plastic box on a pre-prepared table. It was a relatively simple cognitive task centred on creative rather than numeracy or literacy skills ensuring inclusivity of all abilities. The researcher then filled the boxes with key information: a letter about the importance of being prepared to read with/to their families and some other items. Information and suggestions for filling the treasure box were provided in the letter to encourage parents/ carers to engage effectively with their children. Crucially this letter contained information (informed by EA) about the importance of being prepared, having a plan and reducing household risk. Careful attention was paid to specific details, for example:

- That age appropriate PowerPoint slides contained plentiful engaging images;
- Emphasis on ownership of the box was created by producing a purpose made sticker saying ‘This treasure box belongs to’s family’;
- Using water-themed stickers to decorate the box to boost the association to water and flooding;

- Filling the box with items such as a waterproof plastic wallet and a sticker for children to colour when they went home, adding incentive to open the box once it was home.
- That the treasure box was easy to transport (by a lid handle) so that parents / carers were not instantly disengaged by considering it a burden to carry home.

An example of the treasure box is provided in Figure 1.

[Insert Figure 1]

In phase 2, one week later, the researcher returned to school and children were individually interviewed. The researcher thanked the class and explained how useful the children's involvement in the research had been, reassuring them that they had 'helped us to understand more about how to help families'. In further de-briefing, the researcher e-mailed the class teacher with the headline results and sent a box of sweets to be shared by the class.

In phase three (one or two weeks later), twenty-one parents across the two case-studies were interviewed using a semi-structured telephone interview (see Table 4 for format) to investigate whether any intergenerational learning and/or changes in the families' behaviour had taken place. Themes addressed parent awareness of the treasure box, engagement with the flood messaging, subsequent conversations with the child and any links to actual or planned behaviour change, perceptions on the role of children during floods, and the potential role of children in flood preparedness.

[Insert table 4]

Following guidance to ensure that qualitative research and data analysis were carried out in a thorough and transparent manner (Gibbs, 2002; Welsh, 2002) the transcripts from the work with children and the 21 parental interviews were transcribed, coded and analysed using NVivo (Richards, 1999). The coding process involved initial 'careful reading and re-reading of the data' (Rice & Ezzy, 1999) to identify commonalities and patterns. Coding was conducted in two phases. Initial codes were developed to organise the data through a content analysis of the emerging patterns and themes. Using an interpretative approach to the data (Mason, 1996), these initial codes were then combined to produce over-arching thematic codes which were further analysed and from which quotes were selected to inform and support the research findings (see Figure 2). Validation of the themes was achieved through a blind inter-rater reliability test with a colleague. Participants had the opportunity to withdraw

from the research through a letter to parents, and in both cases the school acted as a broker. Ethical clearance was obtained through the host university; UK law requires that adults working with children hold a Disclosure and Barring Certificate (DBS) certificate.

[Insert figure 2]

Results

This section begins by analysing the potential of the group work and treasure box activity to be an effective way to engage children aged 7-9 years in thinking and learning about flooding, and about the importance of being prepared. Themes emerging from interviews with children and parents in relation to inter-generational learning follow.

Engaging children in learning about flood preparation

The group work and treasure box intervention were very popular with the children on the day who thought it ‘Epic’ (child aged 7 years) and ‘So cool. I wish we could do this everyday’ (child aged 7 years) and also when they remembered the activity one week later ‘...we made a special box for flooding with stickers and mine is really cool and I’ve put it in my room’ (child aged 8 years). Teachers also agreed that the intervention had ‘generated a buzz in the school’ and that ‘the children loved making them [the treasure boxes]’.

Parents also commented positively on the intervention:

“Yes. If they had just come home with the letter, you get loads of letters, I don’t know whether I would have paid so much attention to it. I might have listened to [name] but I may not have kind of got into it the same. The box is so visible. The kids, well [name] was really excited, and her group were so excited by it.” (parent of child age 8)

“She was really keen on the project, it really sparked her imagination.” (parent of child age 9 years)

The key issue and measure of success was whether the children remembered the information, and whether they took the treasure boxes home and filled them with appropriate items.

Evidence from the interviews with the children is provided in Table 5

[insert table 5]

Children remembered the information about flooding and recalled a high level of detail about the group work, and about making the treasure boxes which in all but one case were taken home. There was a difference between the ages of children and the likelihood that the children filled the box with appropriate items, with the younger age group (7-8 years) filling the box less often and with less relevant items.

The group work and treasure box intervention combined the reality of the experiences of flooding with a fun creative task. Themes emerging from the group work with children revealed a high level of empathy and understanding of the negative effects of flooding. In response to global photographs of international flood affected people, children talked about life being 'hard'; that 'they might lose their home and toys'. In the post-intervention interviews, children reported that they had talked with their families about 'praying' for recent flood victims and about making and sending useful items. The parental interviews confirmed these reports.

Intergenerational learning

A high percentage of children (75%) reported that they had talked to a parent or family member about flooding suggesting a degree of inter-generational communication. Conversations occurred mainly between parents (Mum mentioned 56 times, and Dad mentioned 44 times) and siblings (mentioned 34 times), but also with grandparents (mentioned 8 times), uncles, aunts and cousins (mentioned 6 times). Most of these conversations were initiated by the children telling their family members about flooding and about the treasure box, or by the parents asking the children what the box was for.

In sixteen cases (11%), children reported that deeper conversations had occurred in their family. Some of these involved parents making suggestions about what to include, and helping their children to fill their box. In five cases, the children indicated that they had done something more once they got home; one revealed that he and his Dad had visited the river and talked about the defences; one said he had written and told a story to his family and relayed this to the researcher. One child said she had made a PowerPoint to show to her family and two said that they had looked for information on the internet:

“I went to the river with my Dad and he told me we won’t flood because we have ‘The Cut’ (local river flood defences)” . (Case study 1: age 9 years)

“Mum helped fill the box, looked at youtube, made another box”. (Case study 1: age 9 years)

“Mum and dad said they could put passports inside”. (Case study 1: age 9 years)

“Mum put plaster inside”. (Case study 1: age 9 years)

“Mum and dad said they'd learned some stuff that they didn't know about flooding”. (Case study 1: age 8 years)

“We had a family meeting and I made a powerpoint”. (Case study 1: age 8 years)

“Mum suggested that Dad come over and he let me put a first aid kit in. I made a story about flooding for my little sister”. (Case study 2: age 9 years)

These reports from the children were confirmed by the parents:

“Yes she did. She said she would put in a raincoat because she would need it to keep dry. She would put in her wind up radio so she could keep updated with the news so she knew what was happening. [...] We were looking in the medical cabinet in the bathroom and she said, we will take those ones because they are waterproof. I think with the plasters she had symbolised more than I thought. I think she was trying to symbolise first aid. She put a soft toy in ... one her brother brought her when she was born. So she put something that was precious to her in there. [...] She said, this is important because it is my first toy so it is something that is important to me. She put a torch in there as well. The water will be dark”. (Case study 2: Mother of child aged 8 years)

In 14% of cases, children reported that conversations with their parents did not occur. This was attributed in many cases (21 overall) to parents not having time or to the stress created by younger siblings.

“I started telling my Dad but he didn’t listen cause the baby was crying his head off”.
(Case study 2: age 8 years)

Although in one case (older) siblings aided further investigation by the child:

“I talked to my big brother cause he’s got a computer in his room and we saw on Sky news there was lots of them [floods]”. (Case study 2: age 9 years)

Some parents also suggested time and family constraints limited their ability to engage with their children:

“No. I don’t really recall because it is really hard, looking after a baby. I have a vague recollection that he was mentioning about those and I just told him that every time, we will do that next time, look at your brother, he is crying. So I never had a chance to go back to him and shape a discussion regarding that. He didn’t really ask me again. It sounds like I will have to pay more attention to what he is telling us”.
(Case study 1: father of 9 year old)

There was some evidence of inter-community learning, with some of the parents revealing that they had talked to friends and neighbours outside the family about flooding.

“But I did read the letter. It helped; it helped my friend as well”. (Case study 1: mother of 9 year old)

“We talked as mothers. Because they had all got, we were really pleased..... They are kind of aware of emergency services but this was like a step on in a way. A little group of mothers, like a friendship group, thought ‘oh wow’”. (Case study 1: mother of 8 year old)

Thematic analysis of parent interviews

In all but one of the parental interviews, parents were aware of the treasure box and that it was related to work the children had done on flooding at school. Several key themes emerged

from the thematic analysis of the parental interviews. It should be restated that out of 21 interviews, only 1 interview was conducted with a male parent / carer.

Theme 1: Empowerment / disempowerment of children as a catalyst to learning

One key issue when considering children as potential catalysts for change is whether children are given 'permission' within their families, communities and societies to educate, influence or affect change. During the group work intervention in school, children were empowered and encouraged by the researcher to talk about what they had learned with their families. In some cases, it was clear that the parents were unable and/or unwilling to allow their children to influence them, believing that it is them as adults and/or parents who should educate their children. As a result, children may have experienced the feeling of disempowerment and an inability to educate or influence:

“.....I think it is more of the parents, your role is more important. As a parent it is about keeping them safe, I wouldn't see that they [children] have a particular role”.
(Case study 1: mother of 8 year old)

“I showed him how things happen, the most places it happens”. (Case Study 1: father of 9 year old)

“She probably did [talk about the treasure box] but I have got two [children] at that school, so I just tend to agree! That sounds awful”. (Case study 1: mother of 7 year old)

When children were given the consent to exert a degree of influence, conversations were deeper and parents more open:

“Yes. I think to be honest she is more prepared than we are!” (Case study 1: mother of 9 year old)

“I said to put it in her bedroom but she said that was not helpful, it needed to be somewhere you could grab it. She was really interested”. (Case study 1: mother of 9 year old)

“So he was talking about the floods down there and how it could affect people which was quite grown up talking”. (Case study 1: mother of 9 year old)

Theme 2: Disconnection

In some cases, there was a sense of disconnection in the interviews suggesting that parents were viewing the subject as a school project rather than something that might be of personal relevance. This may be a consequence of locating the research in a formal educational setting (school).

“The children must worry about it when they see it on the telly. It is good that the schools are getting involved and talking about it”. (Case study 1: mother of 8 year old)

This disconnection was also evident with parents, suggesting a negation or denial of risk:

“Because you don’t really think is going to happen, you don’t really talk about it”. (Case study 1: mother of 8 year old)

Or that flood events happen elsewhere:

“No. I think it was interesting for the children to plan for events like that. It does not happen here, when you are on holiday [abroad]”. (Case study 1: mother of 9 year old)

“Grandad told me about a flood in India. He had to stay in the house. Then he came here and now it is safe. Grandma said there is no flood here.....”. (Case study 1: child age 8 years)

These quotes also suggest some important cultural differences. One school had a high level of cultural diversity which resulted in two important findings. First, the children were acutely aware, interested and proud to point out and talk about their families’ country of origin during the group work, when looking at the map and associated pictures of floods around the world.

Second, the UK can be seen as a place of ‘safety’ to families who may have experienced flooding as a different and more extreme experience.

Theme 3: Contradiction

All parents interviewed strongly agreed (on a Likert scale) that children should know about and be involved in making plans to deal with flooding. Some suggested involvement from age 4 years and some from age 9 years. This would include most children involved in this research suggesting that in principle parents feel that children should know about, and be involved in flood preparations while they are at primary school. Parents also suggested a range of ages (3 to 13 years) as to when children should be involved practically in helping out within the family and community after a flood - although many (48%) suggested their own child’s age of 7 to 9 years.

There was a level of contradiction between parents’ responses to these generic questions and questions asked about their own children. This is evidenced by one parent who gave strong indication (5 on a Likert scale 1-5) that children should be involved in preparing and planning and helping practically, but had earlier said in answer to a question about her child’s role:

“I don’t know really, I think she might be too young, I think she would panic”. (Case study 2: Mother of 8 year old)

Eight parents indicated their intention to do more as a result of involvement in this research process. This may have been the influence of the researcher’s phone call, which highlights the importance of the research process itself in triggering reflection. Suggestions of what they intended to do ranged from ‘finding out more’, to looking on the internet, to making a flood plan. Most parents said that they would not be doing anything further mostly because they felt informed already, that they were not at risk of flooding or that they could rely on flood defences / local services. The latter may indicate a deferral of responsibility to agencies for dealing with flood risk management. There was some evidence of behaviour change towards increased preparedness through some parents helping their children to fill their treasure boxes, but little evidence beyond that. One parent, however, suggested that they had been getting additionally prepared:

“That we have done! What I have been doing is stocking the food up with tins, making sure the cupboards are full so if we, if there is an emergency at least we have

food to eat. I might not have done everything on the list but I have done a little bit".
(Case study 2: mother of 8 year old)

Discussion

Implications for childhood learning

A participatory creative event resulted in young children thinking and learning about flooding and engaging with preparedness. The younger (7-8 years) group of children reported filling their treasure boxes at home with appropriate items less often than the older children (8-9 years). This could reflect subtle differences in development (cognitive, affective and social), and particularly in translating learning into specific (independent) behaviours, illustrating the essential differences within relatively narrow age ranges. This suggests the need to ensure that educational resources and programmes are age-appropriate. As noted earlier, many current educational resources aimed at flood education for children are not evaluated, and include computer based games, stories and videos. Some of these suggest suitability to age ranges of 4-17 years (see Table 1 and the weblink). Given the developmental range in childhood, it is unlikely that one method and/or resource will be cognitively appropriate for such an age range (Piaget, 1972; Shute & Slee, 2015). These resources may also fail to take account of the emotional responses and potential fear that children may experience when thinking about 'risk' subjects such as floods (Peek, 2008).

Using the group work with its associated co-learning, and treasure box methodology made flooding and its' effects real for children, something that could be difficult to achieve through online resources and games. Experiential learning theory would suggest that it is this collective experience that influenced the success in young children learning (Kolb, 1985, 2014). During the group discussions, children talked about the experiences of people that they saw in the photographs. Empathy was displayed by children thinking about the effects of flooding on peoples' lives. This was confirmed by parents of the children suggesting that they had talked with their families and had prayed for or acted altruistically (making and sending blankets). This may also result in deeper and more meaningful learning with thinking, empathy and altruism (Eisenberg & Miller, 1987).

Implications for intergenerational learning

Children talked to their families about flooding as a result of the group work and treasure box, and where parents reported their child had a high level of engagement with the intervention, there was more learning by both the children and parents suggesting a reverse intergenerational learning effect. More deeply, securely attached adults and children are more likely to be open to learning together (Mikulincer & Florian, 1998). So the results may also indicate a relationship between learning and attachment, and have something to say about adults' confidence levels and parenting techniques – that secure attachment both in adults and children will result in higher levels of learning and preparedness. It is challenging to assess whether transformative learning (Mezirow, 1997) could have occurred for both child and adult due to methodological and time limitations in this research, but clearly this is a line of research that warrants further investigation with a longitudinal design. Children learning and transferring learning to their families and communities is a strategy that works elsewhere where there is political will and cultural acceptance (Vaughan et al., 2003), and it has the potential to be implemented in the UK (Maddox, Doran, Williams & Kus, 2011).

We must also acknowledge that there were parents who did not engage in conversations about flooding or with the treasure box. Flood risk areas are often also areas of higher socio-economic need (as in the areas within this research), and there is evidence that parents in such areas may be less engaged with their children (Bradley & Corwyn, 2002). This could indicate that the treasure box intervention, and many one-off interventions, are severely limited in their ability to influence and effect parents and families in settings that may be particularly vulnerable, although a comparative and more affluent area should be included in further research to investigate this more fully. It also supports the need for families in these areas to receive more scaffolded and targeted interventions leading to impacts that are more likely to be sustained (Yoshikawa, Aber & Beardslee, 2012; McLoyd, 1998). Investigating these family relationships, personality characteristics and attitudes and beliefs about response and action could help us understand more about lack of preparedness and barriers to behaviour change, and inform measures that could help develop increased capital.

It was observed that in some cases children were not given the role or permission to act as catalysts to adult learning. An assumption that adults (and parents) should be the ones who

educate children could result in a reluctance of parents to allow children to be ‘Knowledge Holders’ unlike Vaughan et al.’s (2003) findings in Costa Rica. This could also be because the research was conducted in a formal educational setting, and so parents were predisposed to view the information as if it was part of a school project and at a distance, therefore not affecting them personally. Conducting further research in societies with different child-parent relations, and in informal and formal settings, for example, community/social learning settings, would allow closer examination of the factors that impact both on intergenerational learning and its potential transferability from specific settings.

Analysis of the parental interviews identified three main themes: (dis)empowerment, disconnection and contradiction. Research in ESD emphasises a whole ‘project approach’ to teaching sustainability practices at an increasingly early age (pre-school) (Siraj-Blatchford, 2015). This involves empowering children and giving them some autonomy and influence; the idea is that values and attitudes formed early in life will remain and be strong enough to result in more sustainable behaviours in adulthood. The links between feelings of power and control over situations, and [mental] health and wellness are well established in adults (Ryan & Deci, 2000). Recognising a lacuna in similar research with children, Prilleltensky, Nelson and Peirson (2001) found that power and control were also linked with [mental] wellness in children. Importantly, they suggested a developmental (learning) characteristic that may sometimes be missed by parents who are reluctant to give their children power and control. Empowering children in educational settings is a common aspiration; building the relationship between children and schools and encouraging parents’ involvement in children’s education meets with limited success even in the most well designed school (Hoover-Dempsey & Sandler, 1997). The empowerment children felt during the group work in school with the researcher resulted in some children believing that they could educate their families about flooding, and that they could help their families and communities prepare for a flood event through the use of the treasure box (acting as a grab bag). Applying an empowerment theory approach (Zimmerman, 2000) to preparedness behaviour, empowered children who have meaningful conversations and engage in some preparedness behaviour with their parents, may become more prepared adults and reduce their reliance on third parties. Feeling disempowered as they tried (and failed) to talk to their families may have a very negative effect on children’s confidence to affect change, and on their developing values and attitudes. This could result in ‘learned helplessness’ (Seigleman, 1975), deferral of responsibility and in an over-reliance on others, with implications for their potential

functioning as young adults. It is also important that the researcher de-briefs children who may be left feeling disempowered by their involvement in the research process.

The second theme identified evidence of disconnection and ‘Not In My Back Yard’ attitudes (Norgaard, 2011) explained through cognitive dissonance theory (Festinger, 1962). There was evidence of reliance on the perceived effectiveness of flood defences, local government and government agencies, placing the responsibility to prepare for floods elsewhere. A developmental effect could also be evident as children who perceive that their parents do not want to know or talk about flooding (or prepare or take personal responsibility), may develop similar opinions and retain limited awareness. This could result in a consequent lack of action or intention to prepare and a continued reliance on third parties to ensure safety, so reducing overall resilience at household level. Paek et al. (2010) used the trans-theoretical model (TTM) to understand more about emergency preparedness in health settings and suggested factors relating to social cognitive theories (Fiske & Taylor, 2013) of self-efficacy, subjective norms and media effects as main influencing factors.

A level of disconnection was evident in the research as parents believed that children should know about, and be involved in, preparations and family flood plans but were less supportive of their own children’s involvement within the home. As an extension of the group work and treasure box intervention, future research could concentrate on how family flood plans can be co-developed, with children and parents engaging and working and learning together. This would also support the development of flood education strategies that include an element of reverse inter-generational learning, as has been shown to be effective in environmental education in some countries (Izadkhah & Hosseini, 2005; Vaughan et al., 2003).

There was only very little evidence of any disclosed change in behaviour in parents beyond conversations that occurred as a result of the children taking the treasure box home. This could be because not all households involved in the study were at flood risk (although proximal to these areas), and so there was no incentive to change behaviour in the household. Questions focused on the importance of supporting the wider community members, or the school community who may experience flooding did not generate any evidence of behaviour change either. Adapting the design to facilitate children and parents ‘learning together’ in a less formal setting may result in transformative learning and consequent behaviour change,

but in order to investigate transformative learning and observe behaviour change, a longer period of intervention and time is required, recognising the complex processes involved in changing behaviour (Mesirow, 1997; Azjen, 1985).

A combination of educational, psychological and behaviour change theories can provide explanation about the potential for inter-generational learning and children's role as catalysts. The method used here did not support the exploration of parent-child relationships enough to more than suggest that the empowerment of children, developmental issues, socio-economic factors, the development of values and attitudes, and the quality of the parental relationship as well as the political steer, are crucial in predicting whether children will be taken seriously in their attempts to affect change. This operates on family, community, and national levels. Further research isolating these factors more fully within the methodological design will allow more thorough investigation. A theoretical framework detailing how children can be involved in flood risk management should also be developed.

Limitations of the methodology and future research directions

Researching with children is challenging. The method used here was participatory and engaging, and the researcher was skilled and experienced in researching with children resulting in an effective method for investigating how and what young children can learn about flooding. However, there were limitations within the methodology that could be addressed through further research (see Table 6).

[Insert table 6]

Conclusions and implications

This paper addresses an acknowledged gap in flood education research and learning for resilience by young children (aged 7-9 years) and their families. Using an action-based, participatory methodology, a creative and inclusive flood education resource was developed as a stimulus for learning. Children expressed interest and enjoyment during the classroom session, and parents and teachers reported that this enthusiasm had persisted beyond the initial engagement. Knowledge retention by children was found to be high, with notable levels of empathy and understanding about the negative impacts of flooding evident during, and after, the initial session. We therefore consider the approach of a one-off intervention to

have been successful in engaging young children and in facilitating co-learning in formal educational settings.

A second aim of the research was to investigate the potential for young children to be agents in inter-generational learning and in improving household resilience. Interviews with parents revealed several examples of children transferring messages learned in school to home, some of which led to a wider exchange of knowledge around flooding. There is clearly the potential for reverse intergenerational learning to occur, but also for further learning that arises from the subsequent exchange of information within and beyond the family. In some cases these conversations were followed by actions (e.g. children filled the treasure boxes). This suggests that creative, participatory approaches could be effective in not only helping young children learn about flooding, but also translating this knowledge into actions at home, leading to improved resilience.

However, in many instances the intervention did not result in any identifiable improved household preparedness. Thematic analysis suggests a number of key factors such as family relationships (empowerment of children), and the disconnection and dissociation from risk limit the success of intergenerational learning. Nevertheless, the value of including children in household level flood planning was acknowledged by teachers, parents and the children themselves. Rather than considering children just as a ‘highly vulnerable’ group in flood risk management, we suggest they, as citizens, are potentially effective agents in both intergenerational learning and in playing an active part in building household resilience.

If this is to be realised, there are several urgent needs. Firstly, public policy should explicitly recognise the value and potential contribution of children in household resilience planning. Secondly, similar approaches using a range of age-appropriate materials should be trialled for a greater range of ages, and in a variety of socio-economic and flood risk settings. These could include multiple learning interventions over a longer timeline, and more detailed evaluation of the factors promoting or limiting intergenerational learning and translation of knowledge into household action. Whilst this study focussed on classroom activities, further effort could focus on designing and evaluating subsequent family-based activities in learning for resilience.

Table 1 A summary of children’s resources focused on flood education and awareness

Table 1 A summary of children’s resources focused on flood education and awareness: for more detail and web links please see:

Project Lead	Description	Target age group
AHRC funded project: University of Leeds and University of the West of England (UK): Multi Story Water	School river project work, fieldwork and exhibition.	5-11 years.
Science Kids (on-line resource based in New Zealand) http://www.sciencekids.co.nz/	Educational resources for children and parents	Age not specified
British Red Cross	Classroom activities: Flood Response - photo-based activities	School age
Caribbean Disaster Emergency Management Agency	Cool Flood Ready Kids - Flood Academy	For younger household members.
Christian Aid	Learning resources for teachers and youth leaders’ concerning a range of disaster scenarios.	7-14 years.
Cool the Earth (USA) http://www.cooltheearth.org/ Grassroots, school-to-home program	A climate change assembly programme and website	School age
Education Scotland: Ready for Emergencies resource	Emergency preparation learning resource: Journeys and Videos.	Age not specified
Essex (UK) County Council (Developing	Books, on-line games, videos, puzzles,	Age not specified

Community Resilience programme)	stationery and colouring resources.	
Hampshire (UK) Fire and Rescue Service	Susie the child-minder: 'The flood' book – hard copy and online.	Primary school ch
Lancaster University Hull Children's Flood Project -	The Flood Suitcase – Key Stage 3	11-14 years
Mercy Corps: Flood education in Nepal	Hands-on drills and first aid training, and learn about safety precautions through games, art projects and drama competition.	Age not specified
Pima Country Flood Control District, Tucson (USA)	Sherrif Hank Highwaters Flood Safety Homepage: fun things and facts about water and desert environment.	Age not specified
Public Broadcasting Service	Educational flood resources including programme and lesson plan.	9-11 years
Queensland Government: Natural Hazard's Children's programme developed by the Australian Bureau of Meteorology and James Cook University.	Learning and teaching resources for kids, young people and schools. Get Ready Kidnas!: interactive and self-directed educational resource household. Red Alert! Digital Stories: developed by young people aged between 12 and 18 years for their peers. Stormwatchers: a 3D interactive web based game	6-12 years. Age not specified 12-18 years.

		Primary and secondary age.
Save the Children; Disaster Risk Reduction programme; Philippines	Information about being prepared delivered by Save the Children in school – combined with giving useful items to children/families.	Age not specified.
Scottish Environment Protection Agency	SEPA Kids. Flood facts including information on coastal flooding, how floods can affect people. Animations on flood kits, a family flood plan and what causes flooding. Flood play devised by SEPA theatre.	7-11 years. Primary school age
The Federal Emergency Management Agency (FEMA) in connection with The Department of Homeland Security (DHS) (USA)	Be A Hero: various online activities.	8-12 years.
United Nations & International Strategy for Disaster Reduction	Stop Disasters! Online disaster simulation game.	Core age 9-16 years anyone can play a game.

Table 2: Procedure

Phase 1: Groupwork (30mins; 20 minutes discussion 10 minutes making box).
Children came out of their classroom in groups of five or six.
Time spent building a rapport (talking about University) and when the children appeared relaxed the researcher suggested that they look at some pictures on her laptop.
A series of PowerPoint slides with global images of flooding were used to talk about flooding (this followed the sequence, why floods happen, what happens when it floods, the importance of being prepared, how to get prepared).
At a pre-prepared table containing a plastic container and variety of water themed stickers children made a treasure box (see Figure 1).
Children are gathered back into the group and show their treasure box to each other in turn. The researcher commented on a unique aspect of each treasure box and praised the efforts made.
Researcher gave children items to put in their box; a waterproof plastic wallet, a letter for parents (containing information and useful websites about flooding), and a 'praise word' sticker that the children could colour in at home.
Researcher stressed the importance of making a plan and talking to their families at home about flooding.
Children return to classroom.
Phase 2: Interview with individual children one week later
Short semi-structured individual interviews conducted with children. The researcher asked the children what they remembered, what they talked about with their parents/families, what they made and what happened to the treasure box in their home.
Phase 3: Parental Interviews one week later
Semi-structured telephone interviews conducted with parents mostly there and then or in some cases at a mutually convenient time.

Table 3. Details of areas and participants

	<u>Area and Lower Super Output Area (LSOA) reference</u>	<u>Multiple Deprivation area rank</u>	Number of child participants (7-9 yrs)
<u>Case Study 1</u>	<u>Bristol UK (LSOA) [E01033359]</u>	<u>7.3% most deprived area in UK</u>	<u>Male</u> <u>16</u>
			<u>Female</u> <u>26</u>
<u>Case study 2</u>	<u>Swindon UK LSOA [E01015540]</u>	<u>top 10% of most deprived area in UK</u>	<u>Male</u> <u>14</u>
			<u>Female</u> <u>12</u>
<u>Total</u>			26

Table 4. Summary of questions asked in parental telephone interviews

<p>Q1 A couple of weeks ago I worked with your child in school and we made a treasure box. What do you know about it?</p> <p style="padding-left: 40px;">What did she/he tell you about the box?</p> <p style="padding-left: 40px;">What did she/he tell you about flooding?</p> <p style="padding-left: 40px;">What happened to the box?</p>
<p>Q2 There was a letter inside the box, did you read it? What are your comments?</p>
<p>Q3 What conversations have you had with your child about being prepared for flooding? Have you done anything different? If so what? (a list of possible actions was included in prompts)</p> <p style="padding-left: 40px;">Do you plan to do something more? If so what?</p>
<p>Q4 What role do you think children can play in their families and communities in the event of a flood? A likert (1-5 scale) was included so that participants could strongly agree to strongly disagree whether children should be involved in preparations before and in the recovery process in the event of a flood.</p>
<p>Q5 How old should children be before they can:</p> <p style="padding-left: 40px;">Know about flooding?</p> <p style="padding-left: 40px;">Be involved in making a family flood plan?</p> <p style="padding-left: 40px;">Helping their families/communities in the event of a flood?</p> <p>Give reasons for your answers.</p>

Table 5. Thinking, learning and talking about flooding

Case Study	Age	Number of Participants	Level of high recall	Took treasure box home	Filled appropriately	Talked to at least one member of family
1	8-9	23	95%	95%	43%	82%
1	7-8	19	100%	100%	16%	68%
2	8-9	26	100%	100%	69%	81%

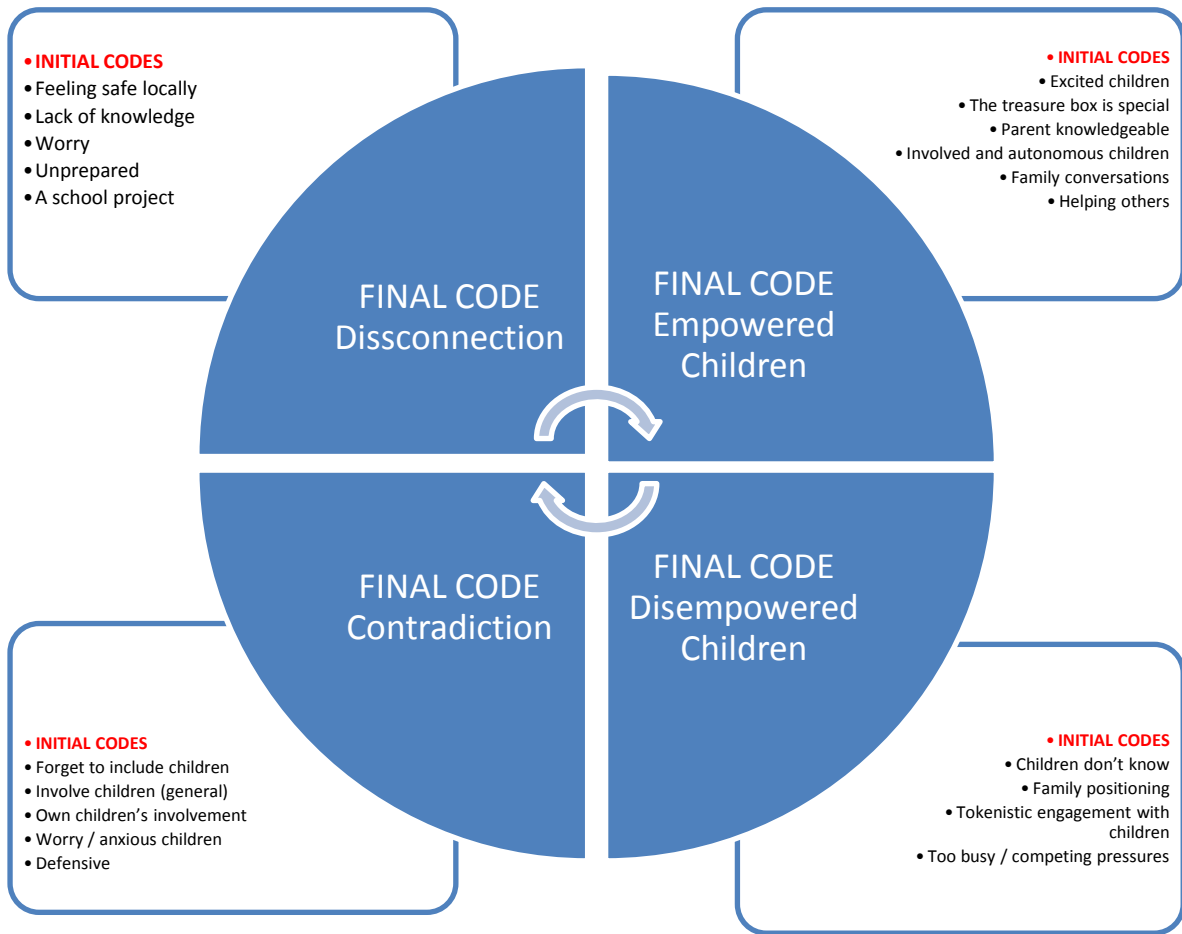
Table 6. Future Research Directions

Limitation	Further Research
<p>The school was in a flood risk deprived area, but this did not guarantee that all the participants were at risk of household flooding with some living in high rise flats or at higher elevations.</p>	<p>Target households at risk of flooding, and or focus on shared / community responsibility for those in flood risk areas.</p> <p>Comparisons of these results with more affluent areas.</p>
<p>Conducting the research within the school setting was practically useful as the school acted as a broker between the researcher and the families. This may, however, have influenced the parents to engage with the topic rather than something personally relevant to them</p>	<p>There is a need to evaluate and compare different settings (formal and informal) and different methods of flood education interventions with a longitudinal element included in the design to ascertain whether children experience ‘deep’ or ‘transformative’ learning about flooding.</p>
<p>A more sophisticated design could allow further investigation of inter-generational learning.</p>	<p>The factors (cultural, social, family relations) influencing successful inter-generational learning in environmental hazards settings require further attention and isolation in order to be investigated further.</p>
<p>Expanding and testing of theoretical models to further investigate effective learning and intergenerational learning and behaviour change.</p>	<p>It is important to bring together the theoretical framing from different disciplinary settings, for example transformative learning from education could be applied to explain the success of the group work and treasure box intervention. Social learning theory from psychology and behavioural change theories can potentially provide explanation about successful and less successful inter-generational learning.</p>

Figure 1: The treasure box



Figure 2. Thematic Analysis showing levels of coding and final codes



References

- Abraham, C., Sheeran, P., & Johnston, M. (1998). From health beliefs to self-regulation: Theoretical advances in the psychology of action control. *Psychology & Health*, 13(4), 569-591.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior (pp. 11-39). Springer Berlin Heidelberg.
- Baily, C. (2009). Reverse intergenerational learning: a missed opportunity?. *Ai & Society*, 23(1), 111-115.
- Ballantyne, R., Connell, S., & Fien, J. (1998). Students as catalysts of environmental change: A framework for researching intergenerational influence through environmental education. *Environmental Education Research*, 4(3), 285-298.
- Ballantyne, R., Connell, S., & Fien, J. (2006). Students as catalysts of environmental change: A framework for researching intergenerational influence through environmental education. *Environmental Education Research*, 12(3-4), 413-427.
- Ballantyne, R., Fien, J., & Packer, J. (2001). Program effectiveness in facilitating intergenerational influence in environmental education: Lessons from the field. *The Journal of Environmental Education*, 32(4), 8-15.
- Barratt Hacking, E., Cutter-Mackenzie, A.N., & Barratt, R. (2012). 'Children as active researchers: the potential of environmental education research involving children', in RB Stevenson, M. Brody, J. Dillon & A.E.J. Wals (eds), *International handbook of research on environmental education*, Routledge, New York, pp. 438-458.
- Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Prentice-Hall, Inc.
- Becker, J. S., Paton, D., Johnston, D. M., & Ronan, K. R. (2012). A model of household preparedness for earthquakes: how individuals make meaning of earthquake information and how this influences preparedness. *Natural hazards*, 64(1), 107-137.
- Begg, C., Walker, G., & Kuhlicke, C. (2015). Localism and flood risk management in England: the creation of new inequalities?. *Environment and Planning C: Government and Policy*, 33(4), 685-702.

- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, 53(1), 371-399.
- Brundtland, G., Khalid, M., Agnelli, S., Al-Athel, S., Chidzero, B., Fadika, L., & Singh, M. (1987). Our Common Future. (\'Brundtland report\').
- Butler, C., & Pidgeon, N. (2011). From ‘flood defence’ to ‘flood risk management’: exploring governance, responsibility, and blame. *Environment and Planning C: Government and Policy*, 29(3), 533-547.
- Chaudhuri, S., & Ghosh, R. (2012). Reverse mentoring a social exchange tool for keeping the boomers engaged and millennials committed. *Human resource development review*, 11(1), 55-76.
- Connell, S., Fien, J., Lee, J., Sykes, H. & Yencken, D. (1999). If it doesn't directly affect you, you don't think about it': A qualitative study of young people's environmental attitudes in two Australian cities. *Environmental Education Research*, 5(1), 95-113.
- Corner, A., Roberts, O., Chiari, S., Völler, S., Mayrhuber, E., Mandl, S., & Monson, K, (2015). How do young people engage with climate change? The role of knowledge, values, message framing, and trusted communicators. *Wiley Interdisciplinary Reviews: Climate Change*. 6 (5), 523–534.
- Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P. & Howe, A. (2012). Creative learning environments in education—A systematic literature review. *Thinking Skills and Creativity*, 8 (April 2013) 80–91.
- Dufty, N. (2009). Natural hazards education in Australian schools: How can we make it more effective? *The Australian Journal of Emergency Management*, 24(2), 13-16.
- Duvall, J. & Zint, M. (2007). A review of research on the effectiveness of environmental education in promoting intergenerational learning. *Journal of Environmental Education*, 38(4), 14-24.
- Eisenberg, N. & Miller, P. A. (1987). The relation of empathy to prosocial and related behaviors. *Psychological bulletin*, 101(1), 91.
- Festinger, L. (1962). A theory of cognitive dissonance (Vol. 2). Stanford university press.
- Fiske, S. T & Taylor, S E. (2013). Social cognition: From brains to culture. Sage.

Geaves, L. & Penning-Rowsell, E. (2016). Flood Risk Management as public or a private good, and the implications for stakeholder engagement. *Environmental Science and Policy*, 55, 281-291.

Gibbs, G. (2002). *Qualitative data analysis: Explorations with NVivo (Understanding social research)*. Buckingham: Open University Press.

Green, C. J. (2015). Toward Young Children as Active Researchers: A Critical Review of the Methodologies and Methods in Early Childhood Environmental Education. *The Journal of Environmental Education*, 46(4), 207-229.

Greig, A & Taylor, J & MacKay, T. (2012). *Doing research with children: A practical guide (3rd ed.)*. London: SAGE Publications Ltd.

Groundwater-Smith, S., Dockett, S., & Bottrell, D. (2015) *Participatory Research with Children and Young People*. London: SAGE Publications Ltd.

Hart, R. A. (2013). *Children's participation: The theory and practice of involving young citizens in community development and environmental care*. Routledge.

Haynes, K. & Tanner, T. (2015). Empowering young people and strengthening resilience: Youth-centred participatory video as a tool for climate change adaptation and disaster risk reduction. *Children's Geographies*. 13(3) 357-371.

Hoover-Dempsey, K. V. & Sandler, H. M. (1997). Why do parents become involved in their children's education? *Review of educational research*. 67(1), 3-42.

Istead, L. & Shapiro, B. (2014). Recognizing the child as knowledgeable other: Intergenerational learning research to consider child-to-adult influence on parent and family eco-knowledge. *Journal of Research in Childhood Education*. 28(1), 115-127.

Izadkhah, Y. O., & Hosseini, M. (2005). Towards resilient communities in developing countries through education of children for disaster preparedness. *International journal of emergency management*, 2(3), 138-148.

Johnson, C. & Priest, S. (2008). Flood Risk Management in England: A Changing Landscape of Risk Responsibility. *International Journal of Water Resources Development*. 24(4), 513-525

Johnson, V. A., Ronan, K. R., Johnston, D. M. & Peace, R. (2014). Implementing disaster preparedness education in New Zealand primary schools. *Disaster Prevention and Management*, 23(4), 370-380.

Kolb, D. A. (1985). Learning styles inventory. *McBer, Boston, MA*, b8.

Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT press.

Maddox, P., Doran, C., Williams, I. D. & Kus, M. (2011). The role of intergenerational influence in waste education programmes: The THAW project. *Waste Management*. 31(12), 2590-2600.

Mason, J. (1996). *Qualitative Researching*. London: Sage.

McLoyd, V. C. (1998). Socioeconomic disadvantage and child development. *American psychologist*. 53(2), 185.

Mezirow, J. (1997). Transformative learning: Theory to practice. *New directions for adult and continuing education*, 1997(74), 5-12.

Mikulincer, M. & Florian, V. (1998). The relationship between adult attachment styles and emotional and cognitive reactions to stressful events.

Mitchell, T., Haynes, K., Hall, N., Choong, W. & Owen, K. (2008) The Roles of Children and Youth in Communicating Disaster Risk. *Children, Youth and Environments*. *Children and Disasters* . 18(1), 254-279.

Norris, F.H., Friedman, M.J., Watson, P.J., Byrne, C.M., Diaz, E. & Kaniasty, K. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981-2001. *Psychiatry*. 65, 207-260.

Norgaard, K. M. (2011). *Living in denial: Climate change, emotions, and everyday life*. MIT Press.

Nye, M, Tapsell, S. & Twigger-Ross, C. (2011). New social directions in UK flood risk management: moving towards flood risk citizenship? *Journal of Flood Risk Management*. 4, 288–297.

- Paek, H. J., Hilyard, K., Freimuth, V., Barge, J. K. & Mindlin, M. (2010). Theory-Based Approaches to Understanding Public Emergency Preparedness: Implications for Effective Health and Risk Communication. *Journal of Health Communication*. 15(4), 428.
- Pain, R. & Francis, P. (2003). Reflections on Participatory Research. *Area*. 35(1), 46-54.
- Paton, D. (2003). Disaster preparedness: A social-cognitive perspective. *Disaster Prevention and Management*. 12(3), 210-216.
- Peek, L. (2008). Children and disasters: Understanding vulnerability, developing capacities, and promoting resilience—An introduction. *Children Youth and Environments*, 18(1), 1-29.
- Percy-Smith, B & Burns, D (2013). Exploring the role of children and young people as agents of change in sustainable community development. *Local Environment: The International Journal of Justice and Sustainability* 18. (3), 323-339
- Piaget, J. (1972). Intellectual evolution from adolescence to adulthood. *Human development*, 15(1), 1-12.
- Pigozzi, M. J. (1999). Education in emergencies and for reconstruction: a developmental approach. *New York: UNICEF, available at <http://www.unicef.org/girlseducation/files/EducEmerg.pdf>, last accessed, 1(07), 06.*
- Prabara-Sear, K. (2015) “Education culture clashes and its impact on environmentally conscious and active youth in Indonesia” Paper presented at the 8th *World Environmental Education Conference: People and Planet – how can they develop together?* Gothenburg. Sweden.
- Prilleltensky, I., Nelson, G., & Peirson, L. (2001). The role of power and control in children's lives: An ecological analysis of pathways toward wellness, resilience and problems. *Journal of Community & Applied Social Psychology*, 11(2), 143-158.
- Red Cross (2007): <http://www.redcross.org.uk/What-we-do/Preparing-for-disasters/How-to-prepare-for-emergencies/Floods-and-flooding>
- Rice, P. L., & Ezzy, D. (1999). *Qualitative research methods: A health focus* (Vol. 720). Melbourne.
- Richards, L. (1999). *Using NVivo in qualitative research*. Sage.

- Ryan, R. M & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, 55(1), 68.
- Ryan, E. L., Hocke, T. M. & Hilyard, K. M. (2012). Ready or not, here it comes. *Journal of Children and Media*. 6(3), 300-316.
- Seligman, M. E. (1972). P.(1975). Helplessness: On depression, development, and death. *Friedman, San Francisco*.
- Sendai Framework for Disaster Risk Reduction 2015-2030 (2015) UN Conference on Disaster Risk Reduction. Sendai. Japan.
- Shier, H. (2001). Pathways to Participation. *Children and Society*, 15, 107–117.
- Shute, R. H., & Slee, P. T. (2015). *Child Development: Theories and Critical Perspectives*. Routledge.
- Siraj-Blatchford, J. (2015). Early Childhood Care and Education for Sustainable Development: Taking Young Children More Seriously. Keynote Speech presented at the 8th *World Environmental Education Conference: People and Planet – how can they develop together?* Gothenburg. Sweden.
- Strachan, G. (2014). Development Education and Climate Change. In *Development Education in Policy and Practice* (pp. 158-172). Palgrave Macmillan UK.
- Sutherland, D. S., & Ham, S. H. (1992). Child-to-parent transfer of environmental ideology in Costa Rican families: An ethnographic case study. *The Journal of Environmental Education*, 23(3), 9-16
- Tanner, T. (2010). Shifting the narrative: Child-led responses to climate change and disasters in El Salvador and the Philippines. *Children & Society*, 24(4), 339-351.
- Tilbury, D. (2004). Environmental education for sustainability: A force for change in higher education. In *Higher education and the challenge of sustainability* (pp. 97-112). Springer Netherlands.
- The UN Convention on the Rights of the Child | UNICEF UK. Retrieved September 29, 2015, from <http://unicef.org.uk/UNICEFs-Work/UN-Convention/>
- Uzzell, D. (1999). Education for environmental action in the community: new roles and relationships. *Cambridge Journal of Education*, 29(3), 397-413.

- Vaughan, C., Gack, J., Solorazano, H., & Ray, R. (2003). The effect of environmental education on schoolchildren, their parents, and community members: A study of intergenerational and intercommunity learning. *The Journal of Environmental Education*, 34(3), 12-21.
- Vogel, J. M. & Vernberg, E. M. (1993). Part 1: Children's psychological responses to disasters. *Journal of Clinical Child Psychology*, 22(4), 464-484.
- Wachinger, G., Renn, O., Begg, C. & Kuhlicke, C. (2013). The risk perception paradox – implications for governance and communication of natural hazards. *Risk Analysis*, 33(6), 1049-1065
- Walker, M., Whittle, R., Medd, W., Burningham, K., Moran-Ellis, J. & Tapsell, S. (2012). 'It came up to here': Learning from children's flood narratives. *Children's Geographies*, 10(2), 135-150.
- Welsh, E. (2002). Dealing with Data: Using NVivo in the Qualitative Data Analysis Process. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 3(2).
- Whittle, R., Walker, M., & Medd, W. (2011). Suitcases, storyboards and newsround: Exploring impact and dissemination in hull. *Area*, 43(4), 477-487.
- Whittle, R., Walker, M., Medd, W. & Mort, M. (2012). Flood of emotions: Emotional work and long-term disaster recovery. *Emotion, Space and Society*, 5(1), 60-69.
- Williams, S. J., Wright, D. B. & Freeman, N. H. (2002). Inhibiting children's memory of an interactive event: the effectiveness of a cover-up. *Applied Cognitive Psychology*, 16(6), 651-664.
- Yoshikawa, H., Aber, J. L. & Beardslee, W. R. (2012). The effects of poverty on the mental, emotional, and behavioral health of children and youth: Implications for prevention. *American Psychologist*, 67(4), 272-284.
- Zimmerman, M. A. (2000). Empowerment theory. In *Handbook of community psychology* (pp. 43-63). Springer US.