ACCEPTED VERSION

Too much, too young? Teachers' opinions of risk education in secondary school geography

Abstract

Ecological and social risks are part of life on Earth, and yet they have increased during the late modern era due to environmental change and rising inequality. People who are well-educated are better able to plan for and respond to risk, both individually and collectively. Geography teachers' perceptions are critically analysed to examine the contemporary approach to risk education. There can be drawbacks of focussing on risks, including the emphasis on negative futures that could dissuade students from engaging with relevant issues. However, a range of advantages of risk education include: engagement with important issues and concepts; learning about practical responses to relevant risks; higher order inquiry-based learning into societal issues; supporting resilience in students; and assistance with personal and democratic decision-making. The teachers' narratives on risk education are used to frame a critical discussion on the roles of the formal education system to prepare students for uncertain futures. The teachers recognised the need for more risk education to prepare students for a second modernity, but cautioned that teaching and learning approaches must focus on appropriate, relevant issues to provide opportunities to imagine and enact hopeful futures.

Introduction

There is rapid change influencing the pedagogy and curricula of secondary education in Australia. Part of the change is being driven by policy and perceived best practice for teaching and learning (Rudd and Gillard 2008; Donnelly and Wiltshire 2014). However, much of the change is being driven by exogenous factors including the shifting demands for entrance into the workforce or tertiary education; globalisation and associated technologies; and, over the last decade, emerging social and ecological risks. Those risks are apparent in a range of forms, many of which may be experienced by students and include issues ranging from bullying and stranger-danger, to road safety and terrorism, to life-long risks of environmental hazards, poverty and exclusion. It is the enduring risks that students encounter as they find their place within society and adapt to environmental change that frame the discussion in this article. The research aims to analyse how, and in what forms risk is taught within secondary school Geography; what the outcomes of that teaching are; and in fact, whether or not it is even the role of schools to prepare students for future risk. The analysis draws from a survey of Geography and/or Society and Environment teachers to critically evaluate the roles of risk education. While the discussion is in the context of secondary schools in South Australia (SA), the implications, like the emerging social and ecological challenges, are universal.

Risk and education systems

There are enormous ecological and social challenges emerging at different scales. As I write this in January 2015, more than a million people have just marched on the streets of Paris to stand up for freedom of expression after the attacks on the French satirical magazine, *Charlie Hebdo*. The 2015 World Economic Forum meeting in Davos, Switzerland was overshadowed by the acknowledgement of the risk of rising inequality undermining social cohesion (Agbonlahor 2015). In Australia, there have been strong debates about increasing costs of public services from university degrees or visits to the doctor, to support for remote indigenous communities, which together could suggest a crisis in

the Australian welfare state. Ecologically, the year began with a bushfire across 13,000 hectares of the peri-urban fringe of the capital of SA, Adelaide, destroying 27 homes (Rice and Robertson 2015). A media report summarised a *Science* article that suggests humanity is exceeding threshold rates of degradation of numerous socio-ecosystems (Steffen et al. 2015; see also Stocker et al. 2013 and Carroll et al. 2014). At the same time, NASA has confirmed that 2014 was the warmest on record globally (NASA 2015), and US President Barak Obama used his State of the Union address to acknowledge that "I will not let this Congress endanger the health of our children by turning back the clock on our efforts to combat climate change" (Lehmann, Irfan, and ClimateWire 2015). There is an argument to suggest that both directly and indirectly, risk will increasingly influence students' lives. Such an argument extends to a proposal that formal education systems will have an increasing role to ensure students are competent in the articulation and evaluation of risk to adapt individually and collectively to the emerging challenges (Bardsley 2007; Mackey 2012; Bonnett 2013).

Risk in its formal sense is framed as a function of the likelihood and severity of a particular hazard on a place or system (Standards Australia/Standards New Zealand 2004). Yet, since the work of Ulrich Beck on the Risk Society in particular (Beck 1992a;b), risk has been conceptualised more broadly in the social sciences to argue that the interaction of environmental and socio-economic challenges, and responses to them, are increasingly shaping the form and function of society (Beck 2009; Urry 2011). Risks are apparent for students currently passing through the secondary education system (Fildes, Robbins, Cave, Perrens, and Wearring 2014). A recent Australian review suggests that Generation Y or Millennials, born from the early 1980s until 2000, could be the first of the modern era to have fewer economic opportunities than earlier generations (Daley, Wood, Weidmann, and Harrison 2014). That same Generation Y will be living through a century in which fundamental environmental change is projected for the earth (Stoker et al. 2013; Steffen et al. In Press). There is now clearer evidence that the actions of earlier generations have generated an "ecological debt" (see

Warlenius, Pierce, and Ramasar 2015), which will need to be repaid in actions by current and future generations. Together the levels of risk suggest that "we have to open up to global dialogues and conflicts about redefining modernity" (Beck 2010, p. 264).

Transformations in society are not easily governed, but must draw from the ability of citizens to understand and critically analyse complex systemic issues and respond effectively (Voss, Bauknecht, and Kemp 2006). Decisions ranging from where people choose to live; to how food, energy or transport is accessed to voting intentions must be informed by comprehensive understandings of risk, and the unequal impacts on different people and places. One of the major inter-generational challenges is the additional costs that must be borne by current generations to ensure future generations can access and maintain sustainable socio-ecosystems. Intra-generational equity is also problematic, because inequality of opportunity across societies and classes, including inequities in education, spill over into unbalanced abilities to respond to risk (Thomas and Twyman 2005; Tracy, Norris, and Galea 2011; Frankenberg, Sikoki, Sumantri, Suriastin, and Thomas 2013). These are not small demands on any generation, as they suggest a requirement for a re-learning and reorganisation of society in a manner that previous generations have not been able to achieve (Berkhout, Hertin, and Gann, 2006; Tschakert and Dietrich 2010; Bardsley 2015).

Education systems must provide people with the capacities to understand narratives on future risk, so that generations to come are willing to support policies and practices that lead to effective responses (Löf 2010; Taylor 2013; Muttarak and Lutz 2014). At the very least, as Beck (1992b, p. 107) states, people must maintain "the right to determine according to their own internal standards the global social question of the most intensely political nature: how safe is safe enough?" In fact, as other religious and community institutions that have framed the development of young people's perceptions of self and place become less important in a reflexive modernity (Beck, Giddens, and

Lash 1995), the roles of schools evolve into broader places of socialisation. That situation increases the responsibility of the education system to meet demands for new knowledge and norms of behaviour that will generate the agency to enable people to make good decisions in relation to environmental hazards and change (Sharpe and Kelman 2011; Boon and Pagliano 2014). How the Australian education system can respond equitably to the new risk given that secondary schooling is failing to provide high quality education opportunities for all students is a specific concern (Reid 2002; Gale et al. 2010; Kenway 2013; te Riele 2015). It is within such a context, that a study was undertaken of teachers' perceptions of risk education in secondary schools, with a focus on the discipline of Geography in SA.

Geography Curriculum: The example of South Australia

It is important for the understanding of teachers' responses to risk education to have some background on how Geography curricula are evolving in Australia. Secondary school curricula have historically been developed and set within Australian states, but that is now changing as core studies in English, Maths, Science, and possibly in the future, History and Geography are established nationally (Donnelly and Wiltshire 2014; ACARA 2015). To date in SA, SA Certificate of Education (SACE) Geography has been taught within the compulsory subject, Society and Environment for students aged 11-15 (school years 7-10), while the distinctive Geography curriculum is taught as an elective to older students (aged 16-18) in years 11-12. Society and Environment curriculum has not been explicit about risk education, although risk is implicit to some dominant themes, including natural resource depletion, war, colonisation, spatial inequalities and crime (Government of SA 2004). In contrast, secondary students who chose Geography experience an explicit focus on the concept of risk in years 11 and 12 (Government of SA 2012), within:

- Key Theme 2: Natural Environments at Risk: This theme develops an understanding of the four spheres of the natural environment (atmosphere, biosphere, hydrosphere, and lithosphere) and how each of these is at risk from human activities.

- Key Theme 3: People, Resources, and Development: This theme, which develops an understanding of population and resources, focuses on human or built environments in those parts of the world where the survival of people is either at risk or continually challenged. The interplay of culture, economics, politics, and other social considerations is critical to this theme.

While the SA Geography curriculum remains in place, a new Australia National Curriculum could have a stronger influence over the subject in the future. Matthews (2013, p. 27) notes that "the seven key concepts set out in the *Australian Curriculum: Geography* are place, space, environment, interconnection, sustainability, scale and change." For school years 7-10, students are supported to reflect on their work on environmental change, food (in)security, spatial social inequality (McInerney 2013), and "propose individual and collective action in response to a contemporary geographical challenge, taking account of environmental, economic and social considerations" (ACARA 2014, pp. 9-10), as well as imaging the outcomes of their proposals. In this manner, the national curriculum would continue to guide an implicit review of risk, but the approach remains one of avoiding a direct focus on the literacy of risk and vulnerability. In fact, environmental and social elements are not as strongly emphasised in the new Australian Geography Curriculum (Maude 2013; Casinader 2015), and Geography may miss an opportunity to claim the concept of sustainability as core to the discipline (Bardsley 2004). Instead, concepts of sustainability are included as an over-arching theme across all national curricula, but here again there are criticisms that strong issues of sustainability are avoided (Gough 2011; Kennelly, Taylor, and Serow 2011). Even then, a recent

review of the national curriculum by Donnelly and Wiltshire (2014) questions the validity of sustainability as a core theme of Australian education.

At a national level, the role of providing for universal school education remains a basic principle of the Australian welfare state (Marginson 1997; Rudd and Gillard 2008). SA Social Inclusion policy aims to bring opportunity to all young people in the state, and it is in that context that Gill (2008, p. 458) states that, "Schools are seen to have an important role, both in modelling inclusive environments and in preparing young people to take their place as participants in the broader community as workers and earners." Marginson (1997, p. 5) also outlines the approach: "education shapes people as citizens. There are also other institutions that do this – for example the family, work, the churches and consumption – but none of these sites are open to government intervention and social change." In a secular state, schools are the only institution that can be made to perform these important roles independently of a young person's background (Reid 2002; Griffin 2014). If pedagogy and curriculum could emphasis appropriate learning about risk, social inequities in agency to adapt to risk could be partially eliminated, and it is within that context that this research examines Geography teachers' perceptions of risk education in secondary schools in South Australia.

Method

The analysis draws from a survey of Geography and/or Society and Environment teachers at the annual conference of the SA Geography Teacher's Association (GTASA) in May 2012. Prior to the survey, teachers received a presentation on the topic of "How much should we be teaching about risk? Climate change and the local region" from the author, and were subsequently asked to complete a brief questionnaire on how, in their opinion, education systems could best teach about risk or even if it that was a role of secondary education. To complete the question, "What are the most important risks your students will face?" teachers were lead through a risk analysis process based on the

Generalized Matrix for determining risk level (Standards Australia/Standards New Zealand 2004). In a guided process of reflexivity (Pillow 2003), they were asked to critically analyse their own teaching on risk. Teachers also provided their opinions on the consequences and likelihoods of different risks in their students' lives, including ecological risks (climate change, drought, natural resource depletion), social risks (widening social inequality, A regional economic downturn, crime) and economic risks (rising living costs, lack of suitable accommodation, employment opportunities). Thus, the approach aims to learn from teachers' experiences (see also McNaughton 2012) to inform an analysis of approaches to risk education.

A total of 59 teachers completed or partially completed questionnaires that were returned, with not all respondent teachers answering each question. All but three of those 59 teachers taught in lower secondary (13-15 year olds) or upper secondary (16-18 year old students) or both (Secondary), the remainder teaching primary students (5-12 year old students). Teachers were asked to indicate the range of years they had been teaching and to categorise the average socio-economic status of their students from Low to High. Those 59 teachers represent almost half of the total of 120 teachers who attended the annual conference that ran over two days (GTASA figures). The responses were transcribed, organised into key themes and critically analysed using a generic approach to interpret the opportunities and drawbacks of risk education (Morehouse 2012). Most of these data discussed below are presented in the form of quotes from the teachers' returned surveys and discussed in qualitative form with citations referencing the source teacher(s), but some key quantitative data are also presented to emphasise particular themes. In this manner, teachers' informed, complicated understandings of risk education are used to construct the discussion on the advantages and disadvantages of the concept and different pedagogical approaches.

Risk education and teaching

Risk is being taught in secondary schools in South Australia. Given the implicit or explicit framing of risks in the curriculum it is unsurprising that almost all Geography teachers are teaching some elements of risk:

- 27 teach elements of both social and ecological risks

- 24 teach only about ecological risks

- 4 teach only about social risks

- 3 teachers did not believe that they were teaching about risk.

The results regarding teaching of risk are not presented according to types of students and teachers because they are confounded by the needs of curriculum that constrain pedagogical choices in SA. Nevertheless, the spatial and temporal relevance of risk was reflected in the fact that two-thirds of teachers identified that the most important risks students will face during their lives would be due to socio-economic factors, with ecological risks also important, but not as strongly emphasised (Table 1).

Table 1 here

The findings on importance of different risks were examined against student age group and socio-economic status (Tables 2-3), but there appears to be no relationship. Interestingly however, the analysis of teaching experience against the emphasis of the types of risks suggests that the more experienced teachers are recognising that it is socio-economic factors that will generate more challenges for their students in the future.

Tables 2-4 here

While many teachers perceive that it will be socio-economic risks that will be most influential in their students' lives, such a perception was not reflected in the focus of their teaching, which necessarily focuses on ecological issues. Even those teachers who concentrate on socio-economic risks were doing so largely in relation to human interactions with ecological issues such as water, coasts, food, wildfires and other hazards, and climate change. Typical of the range of responses were:

- "Clearly in hazards and disasters but also discussed when looking at future impacts of current human behaviour" (Teacher 57).

- "Risk of higher sea levels; risk of the overuse of resources; risk of particular government decisions; risk of becoming an 'affluent' society" (Teacher 33).

- "Human impact on the coast. Also, we look at human and economic impacts on the environment, and where we will be in 50 years" (Teacher 32).

- "Risk of depleting resources and rising costs of existing food sources; pressures on water and food zones; our society's industrial ability to adapt to those potential risks" (Teacher 17).

- "Risks concerning decision making eg. Energy usage; roles of government, business and individuals to understand issues (vulnerability) and to take actions based on impacts (perceived or real)" (Teacher 13).

- "Global warming and climate change. Linked to food production/urbanisation etc. Focus on the effect on lives in developing countries. Students look at the current issues and make predictions for the future" (Teacher 5).

This finding implies a possible mismatch between the focus of risk education on ecological issues and the perceived risks that are going to be most important in students' lives. The material being taught is driven by the curriculum that emphasises the environment, but perhaps the subject is

neglecting core themes on social risk. Teachers different perspectives on the importance of ecological or socio-economic risks could be seen as differing perspectives on the types of risks that they would like to focus on if they were free to do so, but more research is required to focus on that question. For example, Teacher 8 noted that "all decision making involves some element of risk. This element can fit into many aspects of the curriculum. More should be done on social risk, for example why people take risks and are they well informed or is the decision-making taken out of their hands." While there appears to be more opportunity to include social risk education in the SOSE curriculum, it raises the question whether students are accessing opportunities for deeper learning on social and socio-ecological risks, especially as many do not choose Geography in Upper Secondary. Perhaps also, the elements of social risk are more strongly developed in other subjects including Economics, Psychology, Philosophy or English, but results do suggest that more could be made of social issues from a geographical perspective in the curriculum. Teacher 12 noted that conceptions of risk are "a life skill that permeates all areas of curriculum not just Geography. For example, in English and Drama, students read and understand and act out why people and how people take risks, and the benefits/costs of that risk." It needs to be noted that the presentation prior to the survey was on ecological risk, which could have biased results, and yet the teachers themselves recognise that issues of social inequity do, and will continue to, generate significant livelihood and lifestyle issues for the students, especially in the context of future environmental change.

Another broad finding emerging from the teacher survey was that as students learned about risk, they develop a deeper interest in topics and often translate their learning into actions such that they feel part of the solution. Teacher 44 stated that "it can be very empowering for students to make small changes in their lives eg. Recycling to feel they can contribute to lower the risks," and Teacher 39 similarly stated that "it's good to get students engaged in solutions/ideas." Teacher 33 noted that "in

making it relevant to students' lives, the risks become 'real' to them. They feel they have the ability to create change." The approach of explicitly teaching about risk in relation to local issues has led to a range of pedagogical advantages:

- "Students seem to gain more from discussions that incorporate the question of 'What might happen if…' – they enjoy the higher order concepts rather than just learning basic facts" (Teacher 58).

- 'It promotes relevant discussions around potentially controversial issues and how to manage them' (Teacher 43).

- 'It engages students in deep thinking about their place and their influence on society' (Teacher 35, their emphasis).

- "It causes the student to consider the 'what if' scenario, and allows for a deeper exploration of many topics" (Teacher 47).

- "Students are more likely to make links and consolidate learning as it could make learning more relevant and personalised" (Teacher 50).

- "It engages the majority of students due to a 'morbid fascination' and real world implications" (Teacher 27).

Teachers identified risk education as enabling students not only to learn what is presented to them, but also engage in deeper investigations (Bardsley and Bardsley 2007; Sharpe and Kelman 2011; Bonnett 2013). As Mitchell and Borchard (2014) also emphasise, children can be great innovators and lead local adaptation ideas. "Students are genuinely interested in learning about risk" noted Teacher 20, "it makes the curriculum more interesting, relevant and REAL" (their emphasis). "Kids engage with risk – frisson and fear sometimes helps to create evaluations and various responses to the management or planning of risk areas" (Teacher 29).

While teaching and learning about local risks is engaging, it can also lead to learning about specific practical outcomes that are relevant to students' lives (Rivera and Miller 2008). Teacher 31 stated that "if it's not immediately relevant to a student, they close their minds, and don't accept their role." "The advantage is that it places a more personal emphasis on the topic" (Teacher 47), and that it is "engaging and real" (Teacher 23). Teacher 50 stated that the advantage of teaching about risk is important "living in a country with dramatic shifts in weather eg. droughts, bushfire areas and floods." Teacher 59 noted that a great advantage was that "Students in bushfire prone areas give insights for others who are unaware." Similarly, Teacher 4 cautioned that "often the risks are not 'risks' to the students. Immediate risks such as bushfires are ok, but impacts of climate change are too remote." A focus on topics that are relevant to the places and systems that students know can also help to put the risks in proportion and support students to develop appropriate mental models concerning the hazards that they are exposed to in their place (Bosschaart, Kuiper, and van der Schee 2015). Such balanced teaching can also help to avoid the extreme negativity of the scope of global issues of risk.

Avoiding Relentless Doom and Gloom

All but six of the 59 teacher respondents agreed that schools should teach more about risk. While the few that did not made similar points along the lines of: "if we do what we do well, then more is not necessary" (Teacher 54) or "young people need reassurance in what can be a threatening world" (Teacher 29). Those who agreed that more risk education was required, almost universally provided a caveat that the teaching should not focus on negative futures – the "doom and gloom" scenarios that are highly disadvantageous (Teachers 2, 10, 24, 28, 32, 39, 40, 43, 47, 57). "Too much study of risk results in passive/blasé attitudes developing in students. I think students study environmental risks throughout their schooling. A balance is needed so that students can focus on a risk and a solution, and not continual risk, after risk, after risk. We need to leave them with a positive rather

than a negative view of the future" (Teacher 15). Some students "are sick to death of 'talking' about it – that mentality of 'not again'" (Teacher 54). Numerous respondents picked up on the issue of the immense scale of future risk generating a sense of hopelessness, and that the relentless re-emphasis of the emerging risks is detrimental. Typical of the comments was: "Schools need to be mindful of not repeating topics and overexposing students to the same risk studies. Providing it is in a well-organised and balanced way – encouraging students to generate and investigate their own questions by not preaching and balancing positives and negatives realistically" (Teacher 55). Teacher 57 echoed this point when they stated, "It can become a very negative exercise and it is important to stress the optimistic element of adaptability and the ingenuity of the human capacity for risk responses."

There is the potential for risk education to deter students from learning about important issues if not taught effectively. Teacher 56 voiced the concern that there is "growing disinterest with constant fear publicity and mistrust of the authorities/professionals, so why care?" That attitude of not caring, or fearing and denying the emerging risks can be confirmed but other mentors in a child's life, including parents. Teacher 45 noted that "some students go home and tell their parents about what they are learning. This can create 'scared' students, or parents telling the students that the teacher is wrong." Teacher 21 summarised this point with a continuum: "Risks all present challenges - can be overstated = scared off…= turned off!!" Perhaps then the role of risk education must contend with that lack of caring explicitly and attempt to generate appropriate levels of ownership of both the concept of risk and the values of engaging and caring.

The findings here support work by Dickinson, Crain, Yalowitz, and Cherry (2013) who suggest that when dangerous or concerning futures are couched in topics relevant to students' lives then the learning becomes both relevant and effective. For example, Teacher 57 stated that it was "important

not to be doom-mongers, but stress the creativity of managing and responding to risk." Similarly, Teacher 24 noted, "Build an interest, not a fear. Teaching risk can heighten awareness in kids and provide the ability to discuss risks to the environment etc. as well as things we can do to help, so they can feel empowered, buoyant and enthusiastic." Teacher 23 supported risk education but "to the extent that it can engage and problem solve and plan for sustainability and growth." Teacher 18 stated that we "do need to focus on adaptive capacity of humans to prevent pessimism amongst students", while Teacher 17 also noted the need to "look at possible opportunities to make adaptive change." What emerges from the discussion is that there are potential advantages of risk teaching and learning, but it is not just the 'what' of the pedagogical process that is important, rather, as Teacher 11 stated, "we need to inform students about risk, and the world is a risky place, but what it comes down to it <u>how</u> you teach the risks. If you focus only on the negatives then students only see the topic as negative" (their emphasis).

The personalisation of risks can extend to making young people feel responsible for issues in society over which they have very little influence. Teacher 27 cautioned that teaching about risk can send "mixed messages-guilt-fear…" Teacher 32 noted that "it is difficult to provide an unbiased view and avoid the doomsday geographers' predictions. It is difficult for young students to handle." Teacher 28 supported more risk teaching and learning, "but only if done in a way that doesn't make students feel responsible for every problem the world faces." "It can get depressing for the students if they are not given options of moving forward and the possibility of a positive future" (Teacher 25). The level of negativity inherent in risk education raises significant challenges for teachers. "It's hard to balance 'sunshine geography' with negative outlooks which can disempower students" (Teacher 6). Some recognise a responsibility to guide a very careful path to discussions of future risk. "I take a more 'gently, gently' approach as I teach only year 8s, and they can be sensitive to the problems facing

them in the future" (Teacher 9). Similarly, Teacher 5 noted that "it shouldn't be the starting point. We need to foster a love/respect/appreciation of the planet before moving on to 'risk.'"

A range of teachers suggested that part of their cautious pedagogy was the explicit avoidance of the term 'risk', even as they teach the content and emphasise positive elements of response. For example, Teacher 39 stated, "In my teaching I deal with many environmental and social issues and problems, but haven't used the terminology/language as <u>RISK</u>. So I feel that my <u>focus</u>/emphasis/theme is a bit different" (their emphasis). That raises the question of whether the etymology of risk is important or only the concept. Some respondents were quite explicit about why they taught about risk, arguing that a familiarity with the term itself is now required for students:

- "Risk as a motivator/creator – risk creates an opportunity to explore concepts/human instincts etc." (Teacher 35).
- "To allow students to be able to assess risk, solve problems and find solutions – become active citizens" (Teacher 18).
- "Enabling students to comprehend a topic and its impacts. These give them good analytical problem solving skills for all manner of topics they will encounter in the future. It opens up the explanation of 'what can we do?' It provides empowerment" (Teacher 13).
- "It's a good way for students to be empathetic and view a situation from multiple perspectives. We investigate why people choose to live in particular areas despite the risks associated with that area" (Teacher 12).

These insightful comments by teachers suggest that debates about the potential advantages or disadvantages of risk education could be seen to obscure the point that the risk is real and apparent, and whether people like it or not, ecological and social risks need to be prepared for. Irrespective of

the potential for "Doom and Gloom", risk education enables contemporary issues-based inquiries that could be seen to be increasingly vital for students.

A Responsibility to develop a Curriculum of Risk?

A number of teachers argued that there is a responsibility of the education system to teach about risk. Put simply, "it is important for students to be prepared for the world that they will live in" (Teacher 2). The majority of teachers expected that socio-economic risks will increase in the future (Table 1). Some of those risks are clearly associated with a liberal economic society, which provides opportunities but also requires resilience to withstand setbacks or problems (Slater 2015). Teacher 9 noted that students may "not be getting the wages they are expecting to receive" (their emphasis). Teacher 3 similarly noted that risk education "to get students focussed on how future events WILL impact on their lives. They have high expectations – their parents have high incomes – but they will have to adapt" (their emphasis). Teacher 44 noted that social justice and the cost of living were vital issues with "a widening gap between the 'haves and the have nots'". In a specific case, Teacher 18 stated that "the most important risk for regional students whom I teach has been the same in recent years, as it will be in the future, declining rural communities." Teacher 39 also noted that there had been "Social changes due to downturn in agricultural production" leading to "less opportunities and facilities in local towns", especially "no/less jobs for local young people." Arguably, supporting the development of resilience to withstand shocks and hindrances to life paths becomes an important element in education for a reflexive modernity, where the state or other institutions are less likely to provide welfare support.

Several respondents had a sense that students would experience considerable change in their lifetimes and that the formal education process must respond to provide the means for students to navigate those changes:

- "Our current students are going to experience even greater risks and change in their future, especially in relation to social, economic and environmental risks" (Teacher 1).

- "We insulate ourselves to risk, for example with the desalination plant, which gives ourselves the notion that there's no risk or that there is a solution for everything" (Teacher 37).

- "Need to prepare students for increasingly 'risky' world without the old certainties. The government will not be able to mitigate all risk. Students need to adapt, assess, identify risks to their futures" (Teacher 4).

- "Risks are unavoidable! However, students need a base understanding of things so that they can make decisions about risks in an informed way and with positive attitudes" (Teacher 6).

- "We are moving into an era of high risk in terms of environment, social and economic issues, which will impact on students' lives. It is constantly talked about in media etc. and it is important for students to understand what risks are" (Teacher 25).

Globalisation appears to be accelerating or expanding the need to learn about risk. Teacher 10 stated that "We are living in a global community, and it helps students recognise that all lives and impacts are interlinked and interwoven" and Teacher 44 noted that "Students need to know we are all part of this – interconnectedness." Similarly, Teacher 8 highlighted the value of risk pedagogy, because it "makes students aware of the complexities with risk management, that individuals are different and hold different attitudes towards risk, and that people want to be empowered to be able to make decisions based on open information." Teacher 36 stated that it "makes students aware of the environment and what changes there are likely to be, not just here in Australia but globally," and continued on, "The world is changing – students need to be aware of the changes. Students need to be prepared – they need to have an understanding so when they are voting they are ensuring correct policies are being put in place for theirs and the next generation." Teacher 40 also stated at length that, "Students need to be more aware of the risk/impacts of certain things. It makes them question

that risk is associated with many aspects of geography. It makes subjects relevant and keeps them informed. The advantage is to be able to give students all the information, not just what they see in the media. Risk in education gives students the opportunity to find the solution to these risks."

The emphasis on the empowerment of students echoes arguments presented by Mackay (2012), who cites Article 29 of the UN Convention on the rights of the child (UNCROC 1989), which states that "it is the child's right to gain knowledge about the earth so that with this knowledge the child will understand how to care for the earth in a way that is appropriate for their culture, their place of play and learning, and their capabilities." Teacher 39 placed a ring around "Empowering students", and went on, "Giving them the skills and the ability to problem solve and make decisions about their futures" (their emphasis). According to Teacher 35 the goal is for "students to willingly engage with uncertainty." In particular, the personalisation of risks helps students to feel part of a new era. Teacher 30 noted that teaching on risk was "a great way to build confidence in students' abilities to become flexible, adaptable members of our society who embrace change. Due to current projections of our global community, change and risk are inevitable and therefore needs to be prepared for through education."

The forms of representation of different types of risk are being explored explicitly in classrooms. "Students get to explore what is actually being presented in the media, government policy etc." (Teacher 40). Teacher 15 noted, "I find students take on board social risks more than environmental risks these days. They identify with economic risks; they fear the economic risks and tend to see them as more realistic – more likely to affect them eg. climate change is debated so much in the media they question whether it even exists." Teacher 52 also stated that "risk adds interest. Students want to learn about consequences and projections and they question their involvement in the process." Teacher 17 suggested that it was important to outline "competing attitudes to risk through

teaching about bias." These comments suggest that learning about future risk in a manner that is scaffolded by appropriate pedagogical approaches in the safe school environments could be the best way for students to engage with and learn about proportionate and relevant risk analysis and adaptation.

Awareness-raising was seen as a key value of risk education. Teacher 16 emphasised that "students need to be aware of what is happening as they are our future and they need to continue saving the planet." Teacher 14 supported more teaching about risk, "otherwise we are ill-preparing tomorrow's adults to manage and live successfully and sustainably on the planet." "The biggest issue is that the students will not be able to make decisions based on the facts," suggested Teacher 8, and continued, "therefore they will not be empowered – big problem." A similar point was outlined at length by Teacher 52, who stated, "Currently many students see it as other people's problems. They don't realise that they can live more sustainably. They are unaware of how their choices impact the world and that they can influence legislation when they are older." Teacher 56 noted that it is "very important for students to think and act independently, to be aware of how to re-act to risk situations whether environmental, social, political or lifestyle," and continued, "we need to introduce them to strategies for risk management for their future career, lifestyles and community." These notions parallel work by Jones, Instone, and Mee (2014), who argue for the importance of "making risk real" to enable appropriate responses to specific issues. The challenge of the pedagogical process is to achieve that goal of ownership of risk without generating a sense of the enormous scale of the risk making individual thought or action irrelevant.

The responsibility to propagate students' knowledge about ecological and social risk extends beyond the values to the student themselves to include their role as democratic actors (Marginson 1997; Reid 2002; Harry and Klingner 2014; Torbjörnsson and Molin 2015). As McInerney (2013, p. 10) argues

"The engagement of young people with Geography is of paramount importance in the development of an informed, responsible and active citizen." Again, the respondents echoed such notions. Teacher 7 argued that "the issues are so important to our immediate and long-term future, we can't ignore them." Teacher 28 noted that "we need future thinkers on these issues", and Teacher 53 similarly stated that more risk education "would lead to more informed discussion in the community." Teacher 27 simply stated "better informed students = better future decisions." Teacher 26 elaborated on this point: "I feel that it is important to encourage my students to become more 'global' in many respects, particularly their thinking and opinions, through education. That can make for better, informed decisions."

Educators and practitioners are regularly arguing for social learning about socio-ecological change, but if the formal education system is not framing in-depth learning on the key themes of that change, the lost opportunity may not be available in other societal institutions. Perhaps as Geography continues to re-invent itself at a time the discipline is coming under pressure internationally (Butt and Lambert 2014), and aims to generate policy on standards of professionalism and core concepts (Bourke, Ryan, and Lidstone 2012; Matthews 2013), the risk that is re-defining modern society could also aid to delineate the discipline. As Teacher 7 noted, "No other subject deals with these risks as issues like we do" (their emphasis). Social and ecological risks are apparent and are projected to increase, and in that sense, formal geographical education systems could provide a more comprehensive role to facilitate life-long learning through a literacy of and engagement with enduring risks (Kriewaldt 2001; Kopnina 2014).

Conclusion

When they are finding their places in society, the generation currently passing through the education system is likely to confront an era increasingly defined by risk. There is some precedent for the

development of risk education appropriate to a generation. Campbell and Proctor (2014, p. 172) indicate that social studies curricula evolved during the Second World War "to educate children about the broader context of the war." The question that needs to be asked is whether the current generation are facing similar levels of social and ecological risk, and if so, how they should be supported to manage that risk. Students from lower socio-economic backgrounds are less likely to achieve high academic levels; they are more likely to leave school prior to completing Year 12; and they are more likely to go on to poorly paid jobs, or to un- or under-employment (Bardsley 2007; Hatcher 2012). That situation places a unique burden on formal education systems to incorporate education on social and ecological risk in the curriculum, and develop appropriate pedagogical approaches for engaging students to own the concept in relation to their own lives. Students most at risk need the chance to access learning on risk, especially if they do not choose to continue into Upper Secondary School. While this study focussed on a more general theme of risk education, more quantitative research is required to examine how appropriate themes and pedagogy can meet the needs of students in different socio-economic and geographical contexts.

Geography teachers with different levels of experience and teaching to students from a range of socio-economic backgrounds agree in general that risk education is important and that more risk teaching and learning is required, but more experienced teachers are more concerned about social risks. Clearly there can be drawbacks of focussing on risks for students, teachers and for the subject of Geography. Just as clearly, however, a range of advantages of risk education were articulated by teachers including:

- Engagement with current issues and important concepts
- Learning about practical responses to relevant risks
- Higher order inquiry-based learning into societal issues
- Supporting resilience in students

- Supporting personal and democratic decision-making

The high levels of future risk suggest that education systems themselves must become more reflective to meet the needs of students. Here, teachers' enthusiasm for risk education was tempered by the recognition of the potential drawbacks of inappropriate risk pedagogy, especially the overemphasis of negative futures or the failure of progression in learning. On the other hand, there are opportunities to overcome the doom and gloom of risk education by making students realise that they are part of the solution, and they can change their own behaviours or advocate for societal change. As the ecological and social risks projected for the earth increase, a risk education will assist students to conceptualise and articulate issues; allow them to more readily accept some negative impacts of change; and make the types of decisions that will enhance their resilience and adaptability. In a second modernity, an important role of a geographical education becomes one of preparing students for uncertainty and change. More needs to be done to develop curriculum that supports teachers to enable risk education to respond to students' future needs and to provide resources to enable effecting learning and teaching on the topic.

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Table 1 Teachers' assessments of the most important risks that their students will face during their lives

Future risk	Percentage of respondents who mentioned that risk (n=59)
Socio-economic risks	**61**
• Social inequality	15
• Rising living costs	15
• Economic risks	12
• Declining regional communities	5
• (Lack of) employment opportunities	5
• Moral decisions	2
• Personal risks	2
• Population	2
• Social isolation	2
• Understanding of information	2
Ecological risks	**31**
• Drought	10
• Climate change	8
• Resource depletion	8
• Environmental issues	2
Other	**2**
• Change	2
No Answer	**8**

Table 2 Analysis of emphasis on importance of ecological or socio-economic risks in students' lives according to age of students taught

Ages of students taught	Number of teachers in each category who answered this question (n=54)	Average weighting between Ecological (1) or Socio-economic (2) risks being more important
5-12	3	1.67
13-15	19	1.70
13-18	17	1.71
16-18	15	1.67

Table 3 Analysis of emphasis on importance of ecological or socio-economic risks in students' lives according to socio-economic status of students taught

Socio-Economic Status of students taught	Number of teachers in each category who answered this question (n=54)	Average weighting between Ecological (1) or Socio-economic (2) risks being more important
Low	6	1.67
Low and Medium	4	1.75
Medium	25	1.72
Medium and High	2	1.00
High	17	1.71

Table 4 Analysis of emphasis on importance of ecological or socio-economic risks in students' lives according to experience of teachers

Experience of teacher	Number of teachers in this category who answered this question (n=54)	Average weighting between Ecological (1) or Socio-economic (2) risks being more important
Not yet teaching	1	1
1-5 years	11	1.45
6-10 years	12	1.58
11-19 years	7	1.71
19+ years	23	1.87