Films to change a climate: the power of narrative in promoting action competency on climate change amongst New Zealand youth.

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Abstract

Although there is an increasing urgency for individual citizens to take meaningful action to combat climate change, proportionately few New Zealanders are doing so. There is a need for climate change education to be integrated into the New Zealand curriculum in a way that tackles this attitude-action gap and promotes action competency amongst young people. I investigate the reasons behind the attitude-action gap, and discuss the effectiveness of key components of the umbrella movement of Education for Sustainability (EfS) movement in tackling the determinants of this gap, before touching on the barriers that have hindered its widespread implementation in New Zealand schools. I argue that storytelling can be an effective conduit for climate change education because of its effectiveness in transmitting knowledge, and because of its intrinsic transformative potential. Film is a particularly strong narrative medium, and I use Lessons from a Melting Icecap, a film that I produced as part of this thesis, as an example of how a film can be designed to significantly increase student action competency on climate change. I also discuss the results of a survey of filmmaking students that suggests - much as EfS theory advocates - that involving students in community-linked, action-focused climate change filmmaking projects has the potential to be an even more effective way to promote their action competency than simply showing them films. Furthermore, I explain how narrative-based climate change resources and processes can be used to spread EfS throughout the New Zealand schooling system by incorporating them into traditionally non-EfS subjects like English and Media Studies, and by encouraging cross-curricular projects.
Preface

This thesis was written whilst studying at the University of Otago’s Centre for Science Communication (Dunedin, New Zealand). Many people and organisations, in Dunedin and around the world, supported the production of both thesis and film. They are too numerous to list here, but a huge mihi to all who supported me on this long journey!

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The film would not have been possible without the support and vision of Freemasons New Zealand and the Royal Society of New Zealand, and the ongoing backing of RSNZ staff, Faith Atkins in particular. Claire Cowan showed exceptional dedication to produce such a beautiful score even in the light of tight timeframes and even tighter budgets, and without the assistance and encouragement of Guy Ryan, the film’s graphics would have struggled to come to life.

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Introduction

Despite an increasing urgency for citizens to understand, and to individually and collectively mitigate and adapt to climate change, proportionately few people seem to be taking action. There is a pressing need for climate change education to be incorporated throughout New Zealand’s education system in a way that supports and enhances action competence on the issue, so that young people – those who will be most affected by climate change – are empowered to take action.

My undergraduate degree in Ecology was the first time that I was provided with an opportunity to learn about climate change in any detail. Through work with Sustainable Dunedin City, founding and running the Dunedin Secondary Students’ Climate Forum, and as the Enviroschools national Youth Action Coordinator, I began to grasp how little young people know about the issue. As a writer and filmmaker, I started to appreciate the power of narrative as a means for New Zealand youth to begin to positively engage with it. As I have learnt more, I have become increasingly passionate about the need for all young New Zealanders to be supported at school to understand and take action on an issue that will have a significant impact on their lives.

This thesis aims to investigate how the use of films and filmmaking in schools can build students’ action competence on climate change issues. I have attempted this through the production of a film, through a review of the relevant literature in the areas of psychology, education for sustainability, narrative and film, through discussions with teachers and through a survey of young filmmakers.

The film, Lessons from a Melting Icecap, documents the journey of three New Zealand secondary school girls to London, where they investigate sustainability initiatives, and on to Greenland, where they come face to face with the harsh realities of climate change. The film ends with their return to New Zealand, and the actions they take on arrival. It is designed specifically to promote action competence amongst a New Zealand secondary school audience.
In Chapter 1 I draw on the literature to outline the challenges posed by climate change, explain the need for individuals to act on the issue, and discuss what it means to be action competent. I then delve into the problem of apathy and inaction, and investigate factors influencing the attitude-action gap, particularly in relation to young New Zealanders.

Chapter 2 considers what is currently known about climate change education in New Zealand secondary schools. Little research has been carried out on climate change in particular, so I focus on literature from the umbrella Education for Sustainability (EfS) movement, explaining how its key components act effectively to close the attitude-action gap. I then draw on both the literature and discussions with teachers to establish existing barriers to the implementation of EfS and climate change education in New Zealand schools, and conclude with a discussion of the potential for climate change education to become a conduit for EfS throughout the mainstream curriculum.

In Chapter 3, I open literature on narrative to discuss the power of stories as educational tools. I look at their intrinsic narrative effect, both knowledge-based and transformative, and at the potential for this narrative effect to be amplified through careful narrative design. I consider the impact of narrative effect on the attitude action gap, and argue that personal narratives in particular have the potential to play a big role in educating for action competency around climate change issues in our secondary schools. Finally, I contend that film is a powerful vehicle for exploration of these narratives.

Chapter 4 moves from theory to practice. I use the case study of Lessons from a Melting Icecap to describe how a film can be designed for a New Zealand secondary school audience to promote action competency on climate change issues. Pulling in EfS theory, I then discuss the need for such films to be backed up with a place-based, community-linked, action-focused project, to ensure maximum effect. I use a survey of student filmmakers to establish the potential for filmmaking as learning process that effectively closes the attitude-action gap. Finally, I discuss the barriers to, and opportunities for, film and filmmaking as conduits for climate change education (and thus EfS) throughout today’s mainstream curriculum.
Chapter 1

Climate change, the need for action competency, and the attitude-action gap.

In this chapter I will outline the challenges posed by climate change both globally and nationally, and the impact it is likely to have on the next generation of New Zealanders. I will explain why individuals' action on climate change is so important, and discuss what it means to be action competent on climate change issues. Finally I will outline the problem of apathy and inaction amongst the younger generation of New Zealanders, and investigate factors influencing the attitude-action gap, relating these factors back to the challenges facing young New Zealanders.

1.1 The problem of climate change

1.1.1 The global problem

Climate change has never been higher on the international agenda. As citizens we are constantly reminded by politicians (e.g. Obama 2009; Rudd, cited in AAP 2007), United Nations agencies and officials, (e.g. Ban, cited in UN News Service 2007; Watkins 2007) and aid and conservation organizations (e.g. Adams and Jenrenaud 2008; Niskala, cited in International Federation of Red Cross and Red Crescent Societies 2008) that it is one of the greatest, if not the single greatest challenge facing humanity today. Economists have recently added their voice to the chorus – the 2007 Stern Review concluded that climate change is a serious global threat demanding an urgent global response (Stern 2007) - and the international medical community has recently said climate change may be the biggest global health threat of the 21st century (Costello et al. 2009). Scientists have never been more categorical in their warnings of the potentially devastating effects of human-induced climate change. In their Fourth Assessment Report (AR4) the United Nations’ Intergovernmental Panel for Climate Change (IPCC) states that the case for human-induced climate change is “unequivocal” (Pachauri and Reisinger 2007, p. 2), and
that it could cause widespread, “abrupt” or “irreversible” impacts (Pachauri and Reisinger 2007, p. 13). The report predicts that the world’s average temperature will be between 1.8 and 4°C higher by 2100, and sea levels will rise by between 28 and 43cm (Pachauri and Reisinger 2007). AR4 predictions, however, do not take into account the impact of melting polar icecaps on sea level, nor the impact of positive feedback loops (the effects of warming releasing more carbon, and thus causing yet more warming). More recent reports (e.g. Allison et al. 2009, Richardson et al. 2009), which take into account post-AR4 science, suggest IPCC estimates are conservative. Polar icecaps are melting faster than previously thought, and the most recent science suggests the world will be facing a meter or more of sea level rise by 2100 (Richardson et al. 2009).

The global community began responding to climate change at the 1992 United Nations’ Earth Summit in Rio de Janeiro. There, member countries adopted the United Nations Framework Convention on Climate Change (UNFCCC). Climate change was accepted as a “common concern of mankind” (United Nations 1988, para. 1), and the tenets of sustainable development and the precautionary principle were accepted. Sixteen years and thirteen Conferences of the Parties later, many argue that little progress has been made (e.g. Prins and Rayner 2007a). The Kyoto Protocol (which has binding targets for developed countries, to be met by 2012) entered into force in 2005, and has now been ratified by 171 countries (UNFCCC 2007). Critically, it doesn’t include targets for developing nations, and has not as yet been ratified by the United States. Some argue that it hasn’t produced demonstrable reductions in emissions, or even in anticipated emissions growth (e.g. Prins and Rayner 2007b). Others focus on the importance of including the world’s two largest carbon emitters – China and the United States – into global agreements around emission controls (e.g. Victor et al. 2005). Talks are now underway to develop a post-Kyoto agreement, but even these look shaky (BBC 2009).

1.1.2 The New Zealand problem and the importance of individual action

In New Zealand, regional warming has already occurred, and the impacts of climate change are already being felt. The IPCC’s AR4 predicts that New Zealand’s climate will become increasingly warmer with more heat waves and fires, and more frequent and intense floods, landslides, droughts and storm surges. Risks to major infrastructure will escalate in the face of the increased frequency of these extreme events. There will be
fewer frosts and less snow, and while the west of the country will become wetter, the east will become drier. Substantial water scarcity is predicted by 2030 (in Northland and some eastern regions) as well as coastal flooding by 2050 (Northland to Bay of Plenty). New Zealand will experience a significant loss of biodiversity by 2020, particularly in alpine areas, as species fail to adapt to the effects of climatic changes. It is expected that production from agriculture and forestry will decline by 2030 over much of eastern New Zealand, although areas around major rivers in Southland may see an initial increase in production as a result of a longer growing season and fewer frosts. A warmer climate may lower the incidence of some winter ills, but raises the possibility of tropical pests and diseases successfully invading from elsewhere. (Hennessy et al. 2007).

Climate change is also likely to have indirect impacts on New Zealand. It’s likely that the country will be a destination for climate change refugees, particularly from the Pacific (Hennessy et al. 2007), as rising sea levels erode land and inundate coastal Pacific Island settlements, many of which sit very close to current sea level (Mimura et al. 2007). Countries the world over will be affected by climate change and disrupted by an increasing frequency of extreme climatic events (Pachauri and Reisinger 2007). This will be felt in New Zealand as increasing volatility in interactions with the global economy, e.g. in import and export markets and in tourist numbers. The IPCC warns that the implications of these changing global interactions are large for New Zealand because of its strongly export-based economy (Hennessy et al. 2007).

The New Zealand Prime Minister in 2007, Helen Clark publicly declared carbon neutrality to be a national aspiration. “I believe New Zealand can aim to be the first nation to be truly sustainable across the four pillars of the economy, society, the environment and nationhood. I believe we can aspire to be carbon neutral in our economy and way of life.” (Clark 2007, para. 24). In spite of this, her Government, when in power, struggled to reduce New Zealand’s carbon emissions. In terms of its international agreements, New Zealand is not expected to meet its Kyoto Protocol target of reducing emissions to 1990 levels by 2012. New Zealand’s carbon emissions over the first commitment period will average out at an estimated 78.3 million tonnes carbon dioxide equivalent – a rise in emissions of more than 30% comparative to 1990 levels (New Zealand, Ministry for the Environment 2008a). The last six years of Labour-led
Government saw the development and subsequent demise of both a levy on emissions from farm animals (the ‘fart tax’) and a carbon tax on goods and services. A controversial Emissions Trading Scheme passed into law in late 2008, and although many argued it was weak (e.g. Fitzsimons 2008), the incoming National-led Government quickly parked it for a review. The resulting legislation has been labeled “incompetent” and “damaging” (Oram 2009, para. 32), “farcical”, “undemocratic” and “politically unsustainable” (New Zealand Listener 2009, para. 2). As Atkinson (2007) claims, the two failed carbon taxes – abandoned in the face of public opposition – and the difficulty in getting the Emissions Trading Scheme through Parliament, show that government alone cannot avert the climate crisis. Schreiner et al. (2005) point out that, at the macro political level, the financial systems of many economies are linked to oil consumption, so there is a conflict between reduction in carbon emissions and the demand for a stable or growing economy. Politicians try to find a balance between doing the best they can for the country, and getting re-elected. Legislation can play a role, but policy must reflect public opinion, and thus climate change isn’t just ‘the Government’s problem’, but the public’s problem as well (Atkinson 2007).

Perhaps because of the frustrating lack of movement at the government level, a lot of emphasis has in recent months been placed on the importance of action at the individual level. At the launch of AR4, IPCC Chairman Ragendra Pachauri declared the need for “a new ethic by which every human being realises the importance of the challenge we are facing and starts to take action through changes in lifestyle and attitude” (Zhang 2007, para. 5). At the same launch, Achim Steiner, Executive Director of the United Nations Environment Programme (UNEP), said that “unless people care about what’s written in this Report, political leaders cannot move” (Zhang 2007, para. 6)

**1.2 What constitutes individual action?**

Pro-environmental behaviour is defined as personal action that directly and consciously “seeks to minimise the negative impact of one’s actions on the natural and built world” (Kollmuss and Agyeman 2002, p. 240). Jensen (2002, p. 326) contends that this definition is too narrow in its scope – espousing the similar but slightly broader “action competence” approach.
First espoused by researchers at the Royal Danish School of Educational Studies, action competence is similar to Kollmuss and Agyeman’s pro-environmental behaviour in that it defines ‘action’ not in terms of the behaviour itself, but by the motivation behind the behaviour – an ‘action’ is intentional. In the same way, it argues that ‘competence’ is more than just possessing ability – it’s about being willing to carry an action out. An ‘action’ is self-directed, rather than the result of an instruction from an authority. And while ‘investigative actions’ may be carried out to establish the extent or nature of the problem, true ‘environmental actions’ must address the root causes of a problem. (Breiting and Morgensen 1999; Jensen 2002; Jensen and Schnack 1997).

Despite these similarities, Jensen argues that there are two significant types of action that pro-environmental behaviour (as defined by Kollmuss and Agyeman 2002) neglects to encompass. Although Jensen distinguishes direct actions, or “actions that directly contribute to solving the environmental problem that is being worked on” (Jensen and Schnack 1997, p. 170) from indirect actions, or “actions whose purpose it is to influence others to do something to contribute to solving the environmental problem in question” (Jensen and Schnack 1997, p. 170), both are considered to fall under the action competence umbrella. Kollmuss and Agyeman’s pro-environmental behaviour, Jensen (2002) suggests, does not take in these indirect actions, nor does it include collective action – and in the real world, collective action is often what is required. Jensen’s (2002) argument is based on the assumption that environmental problems are grounded in the structure of society and in people’s ways of life. The aim, therefore, must be to ensure that citizens are able to act to solve problems both at personal and societal levels – and to reach this goal, both indirect and collective actions must be employed.

In relation to climate change, this argument is particularly relevant. New Zealand authorities are focused on reducing people’s individual carbon footprints, because the sum of New Zealanders’ individual action amounts to a significant reduction in carbon emissions (New Zealand, Ministry for the Environment 2007a; New Zealand, Ministry for the Environment 2008b), and doesn’t require radical structural change. But because individual actions take place within the context of New Zealand society, as long as there are high carbon processes, structures and values in place at the societal level, the maximum possible reduction in New Zealand’s carbon emissions will not be reached. Collective action, and indirect action (lobbying of central and local government, as well
as community based social marketing) must play a central role in changing these processes, structures and values, before carbon emission reduction can reach its full potential. Finger (1993, cited in Sobel 2007) found that some experience of environmental activism was a crucial determinant of direct pro-sustainability behaviour in Swiss adults, and concluded that social and collective change were therefore a necessary part of education activity. The argument for inclusion of indirect and collective actions under the umbrella is therefore very strong. It is backed up by Tilbury’s (1995) list of actions designed to solve environmental problems – four of her six categories (outline in Table 1, below) could be considered indirect action.

**Table 1: Tilbury’s (1995) action categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negotiation</td>
<td>Attempting to reach an agreement over an environmental issue, policy or practice through discussion</td>
<td>Indirect</td>
</tr>
<tr>
<td>Persuasion</td>
<td>Attempting to modify other’s viewpoints, through public debate, speech making, letter writing, pamphleteering or media campaigns, and community based social marketing</td>
<td>Indirect</td>
</tr>
<tr>
<td>Consumerism</td>
<td>Discriminating through social action or boycotting goods and services; economic action aimed at changing business policy and products</td>
<td>Direct</td>
</tr>
<tr>
<td>Political Action</td>
<td>Attempting by means of lobbying, voting or supporting candidates to persuade an electorate, a legislator or government to adopt a particular environmental policy</td>
<td>Indirect</td>
</tr>
<tr>
<td>Legal Action</td>
<td>Attempting to ensure the enforcement of a law or the constraining of certain behaviour by legal means</td>
<td>Indirect</td>
</tr>
<tr>
<td>Ecomanagement</td>
<td>Maintaining or improving the landscape through physical action</td>
<td>Direct</td>
</tr>
</tbody>
</table>

(adapted from Tilbury 1995)

Even direct actions could potentially have an indirect impact – putting out recycling regularly might influence a neighbour to do the same.
Gough (2002) outlines yet another problem with the ‘pro-environmental behaviour’ definition, arguing that meaning is socially constructed, and it therefore can mean different things to different people (Sauve 1996). The impacts of what one group perceives to be ‘pro-environmental behaviour’ can be different at different scales, impacting negatively on other people’s constructed notions of ‘environment’. Actions which benefit the built environment tend to degrade the natural environment, and vice versa. Finally, he argues that to use the word ‘minimise’ is wrong because it fails to acknowledge the reality that the ultimate goal is an acceptable trade off between the interests of humans and those of non-humans. The advent of notions like Cradle to Cradle design (McDonough and Braungart 2002) suggest that the definition needs to be expanded to include actions which maintain or generate ecological value, rather than those that simply minimise the negative.

In line with this consideration, the concept of action competence asserts that solutions to environmental problems are not just quantitative but qualitative, and therefore citizens must be “capable of envisioning alternative ways of development and ... able to participate in action according to these objectives” (Jensen and Schnack 1997, p. 164). In essence, it promotes the importance of critical enquiry and participation in democracy. It argues that, if citizens are able to identify, exploit and analyse conflicting interests [relating to resource management] and the way the affect the future, then in the long term they will be better qualified to handle environmental problems. For the purposes of this thesis I have thus adopted ‘action competence’ as the ultimate goal of environmental education, but also use the term ‘pro-sustainability behaviour’ to describe any conscious action (individual or collective) that aims either directly or indirectly to safeguard the life-supporting capacity of natural and physical resources. The term pro-sustainability behaviour encompasses the concept of pro-environmental behaviour, but is broader in its scope and recognises that the action in question must be towards achieving sustainability.

1.3 New Zealanders’ engagement with individual action

New Zealanders purport to care quite a lot about environmental problems, but don’t seem to be acting in line with this concern. In the Ministry for the Environment’s 2007 Household Sustainability Benchmark Survey (hereafter referred to as the 2007 Survey),
53% of respondents stated they were “deeply concerned” that New Zealanders aren’t doing enough to protect the environment for future generations, but just 31% reported that they “plan and take into account the impact on the environment” in most things they do (Fryer et al. 2008, p. 7). The findings of the 2008 State of the Environment Report are proof that, if we are worried about our effect on the environment, we’re certainly not acting on it individually. On the contrary - we are living in bigger houses with fewer occupants, we are consuming more, and our energy demand is rising steadily. We own more cars per head of population than almost any other country, and our cars are getting larger and older – and therefore less fuel-efficient. We’re also driving further in them than ever before, and emitting a lot of carbon in the process (New Zealand, Ministry for the Environment 2007b). The dominant assumption seems to be that the climate change problem is too big for the individual to solve, and therefore it’s business-as-usual for most individuals.

Although younger generations will suffer the worst effects of today’s environmental degradation, the average young New Zealander appears to be almost as apathetic about sustainability. When it comes to civic engagement, just one in four 18-24 year olds enrolled to vote in the 2008 national election (Elections New Zealand 2008). A 1997 study of 700 16 and 17 year old New Zealanders found that just 21% had signed a petition, written a letter or attended a meeting to protect the environment, and just 12% had reported or complained about something they thought was bad for the environment (Keown 2002). The 2007 Survey suggests that, relative to other age groups, 18-29 year olds are less likely to consider the environmental impact of their everyday actions. 42% of those surveyed admit to doing little to help with the environment, in spite of the fact that 54% are “deeply concerned” about the level of action for the environment (Fryer et al. 2008, p.7). Although the 2007 Survey suggests that most young New Zealanders frequently engage in household actions that benefit the environment (e.g. recycling), it should be noted that the proportion taking action is highest where it is also cheaper, easier or healthier. Oft-cited reasons for lack of action are lack of time and financial costs (Fryer et al. 2008). The 2007 Survey also failed to examine the level of young people’s engagement with actions that demand more personal sacrifice, like avoiding air travel. These have been examined by similar overseas surveys. A British survey of national university applicants found that although 84% of respondents believed climate change would be affecting their lives within 25 years, just 16% expected to avoid taking
a flight for environmental reasons within the next 10 years (Forum for the Future 2008). It’s likely that such opinions would be shared by young people in New Zealand, where an ‘Overseas Experience’ is almost a rite of passage, and visiting any other country requires travel over large distances. The unwillingness of people to make significant changes to their lifestyle is backed up by a 2007 United Kingdom Department for Environment, Food and Rural Affairs (DEFRA) survey which found that, although the majority of Brits subscribe to the need for individual behaviour change, almost half agreed that any change they make to help the environment needs to fit into their lifestyle (DEFRA 2007). Another British study found that individuals use their engagement with small green household actions like recycling to justify carbon-intensive actions like flying (Barr, 2008).

1.4 The attitude-action gap

The ‘value-action gap’ (Blake 1999) or ‘attitude-action gap’ (Kollmuss and Agyeman 2002) is a term coined by environmental psychologists. It describes the almost ubiquitous disparity between the (relatively high) level of environmental knowledge and awareness that individual possess about environmental problems, and the (relatively low) level of pro-sustainability behaviour that they display. This is the disparity New Zealanders are exhibiting, but they are not alone. On the climate change issue in particular, public response not only in terms of individual behaviour, but also in terms of social activism and pressure on government, has been meager in all Western nations (Norgaard 2006). Over the years multiple theoretical frameworks have attempted to establish the reason for the attitude-action gap. Early linear models were based on the theory that increased environmental knowledge led to changes in attitudes and more pro-sustainability behaviour, but it has now been established that an individual’s level of environmental knowledge plays only a minor role in bringing about pro-sustainability behaviour (Hungerford and Volk 1990). Owens (2000) reasoned that models are becoming increasing complex because while greater knowledge may be worthwhile in its own right, barriers to action do not lie primarily in a lack of information or understanding. More important mediating factors are the framing of problems, social and political context, and personal and institutional constraints.
Over the years researchers have drawn on models of pro-social behaviour e.g. Schwartz’s Model of Normative Decision-Making (Schwartz 1977, Schwartz and Howard 1981), recognizing the large influence social norms have on pro-sustainability behaviour, and the fact that to a great extent pro-sustainability behaviour is altruistic (Klocekner and Matthies 2004). Kollmuss and Agyeman (2002) completed an analysis of a number of models attempting to explain the attitude-action gap, and summarised influencing factors into three main categories. This analysis has been endorsed even by those who critique their central focus on pro-environmental behaviour (e.g. Breiting and Morgenson 1999, Gough 2002). Their categories are outlined below, and each is related back to its potential role in preventing young New Zealanders from engaging in action to lower their carbon footprint.

1.4.1 Demographic factors

In the DEFRA study described above, young people, in particular young men between 16 and 29, and those in lower socio-economic groups were most likely to say that the environment was a low priority in their lives. The New Zealand trends outlined above suggest that age is similarly important here. Whether this is the characteristic of an entire cohort of New Zealanders, or whether it is an age-related set of values that will change in a single cohort over time, remains unclear.

Kollmuss and Agyeman (2002) identify two further demographic factors – gender, education. Studies have found that, although women have less environmental knowledge, they are more emotionally attached to environmental issues, believe less in technological solutions, and are therefore more willing to change their lifestyles than young men. And those that are more educated have more environmental knowledge, but this does not necessarily translate into more pro-environmental action.

Other studies have found ethnicity to be an influencing factor - Milfont et al. (2006) found differences between European New Zealanders and Asian New Zealanders in “environmental motive concerns” (Milfont et al. 2006, p. 745), and the implications for their exhibition of pro-sustainability behaviours. They found that Asian New Zealanders were more egoistic in their concerns than European New Zealanders, who tended to be more concerned about the broader environment. In European Kiwis, this biospheric
concern was positively correlated with pro-sustainability behaviour, while for Asian New Zealanders both biospheric and altruistic concern predicted pro-sustainability behaviour.

1.4.2 External factors

External factors refer to the wider context within which an individual takes action. In many ways these are beyond the individual’s immediate control, but impact significantly on individual decision-making.

a. Institutional factors

Kollmuss and Agyeman (2002) argue that pro-environmental actions can only be made where the infrastructure is in place to support them. In many parts of New Zealand the infrastructure is not developed to a level that ensures pro-sustainability decisions are the easy option. In 2006, for example, kerbside recycling was still not available for over 25% of the population (New Zealand, Ministry for the Environment 2007b). And although substantial central Government funding has been poured into public transport recently, many consider it has a long way to go to be an ‘easy’ option.

b. Economic factors

People’s behaviour is strongly influenced by economic factors. People opt for decisions with short payback times – choosing a ‘cheap’ item often has a shorter payback time than buying an ‘environmentally friendly’ one.

Young people in New Zealand are among the poorest in the country. They earn the least (Statistics New Zealand 2007), many have large student loans (New Zealand, Ministry of Education 2007a), and rates of home ownership are falling dramatically amongst young people (Housing New Zealand 2004). It could be suggested, therefore, that economic factors will be a significant barrier to young people acting pro-environmentally.
Kollmuss and Agyeman (2002) note that economic incentives can be used to encourage people to exhibit pro-sustainability behaviour, but warn that they can backfire when they are removed.

c. Social and cultural norms

Pro-sustainability behaviour can be suppressed by existing social and cultural norms. The causes of climate change are rooted in our present and preferred lifestyles (Andrey and Mortsch 2000). Today’s youth are growing up in a society where the wider community is only just coming to grips with this concept, and the extent of the changes needed to make Western society sustainable. Norgaard (2006) goes as far as to argue that Western societies are employing “denial as a socially organised process” (Norgaard 2006, p.350), collectively ignoring climate change because it safeguards prosperity and an easy way of life.

Social norms of attention – that is, the social standard of ‘normal’ things to think about – are powerful, albeit largely invisible, social forces shaping what we actually do think about. Just as social norms of attention create the sense of what is real, they also work to produce the sense of what is not real, what is excluded from the immediate experience of normal reality.

(Norgaard 2006, pp. 361 – 362)

There is certainly evidence to support this hypothesis in New Zealand. Most pro-sustainability behaviour is still not a social or cultural norm. Many sectors of the New Zealand community still consider economic growth to be imperative (The Treasury 2003) despite strong evidence that it has detrimental environmental and social impacts (Statistics New Zealand 2002). As New Zealand’s economy has grown, so too have household spending and consumption - and New Zealand’s carbon footprint (New Zealand, Ministry for the Environment 2007b). High rates of consumption are fueled by increasingly savvy advertising. In 2007 New Zealand’s advertising industry turnover exceeded NZ$2.3 billion (Advertising Standards Authority 2007). Increasingly, advertising targets young people (Parliamentary Commissioner for the Environment 2004). Even Government documents are as yet promoting only ‘softer’ carbon reduction options – there is no mention of reducing flight-miles, consumption, or the amount of
meat and dairy in the Kiwi diet (e.g. New Zealand, Ministry for the Environment 2008b). Young people growing up with this norm of socially organised denial of climate change are arguably likely to perpetuate it, continuing to turn a blind eye to required behaviour change.

Teens’ social organization is such that it reinforces the strength of social norms. Most adolescents identify themselves with a peer group, which is recognised as providing a sense of belonging and support during a phase of “physical, emotional and cognitive adjustment” (Tarrant 2002 and references therein). Although the extent of peers influence relative to parents’ is debated, and it is likely that their level of influence is different in different areas (Biddle et al. 1980); many studies have shown peers to significantly shape each other’s behaviour (e.g. Berndt and Keefe 1995; Davies and Kandel 1981; Jaccard et al. 2005; Wood et al. 2004). And young people are conformists, with conformity peaking between 11 and 13 years (Constanzo and Shaw 1966). Under the combined pressures of peer influence and a desire to conform, it’s easy to see how focuses like sustainability, which aren’t yet social or cultural norms, are sidelined.

1.4.3 Internal factors

Internal factors are related to individuals' mindsets and thought processes. They are often unconscious modes of thinking that influence every decision we make, and are therefore, although theoretically more within an individual’s control than external factors, often more difficult to identify and address.

a. Motivation and priorities

Primary motives (which are larger scale, e.g. environmental values) are often diluted by selective motives (which are smaller scale, and push for one specific action e.g. personal comfort). A good example is heading out to coffee with a friend. If it's a sunny day and the friend wants to sit in the park, there's a lot of pressure to accept a take-out cup regardless of over-arching environmental concerns. Usually we prioritise the wellbeing of our families and ourselves. If pro-sustainability behaviour is aligned with these, we’re more likely to act pro-environmentally.
Twenge (2006) argues that Generation Me has grown up embedded in a culture where self-centric phrases like “Be yourself”, “Believe in yourself” and “You must love yourself before you can love anyone else” are deeply entrenched beliefs, and that today’s young people are more self-absorbed and more egocentric than previous generations. Because today’s younger generation has so many options, there is a lot of stress tied up in making the correct choices. Furlong and Cartmel (1997) argue that these demands are enough to drive young people to exhibit self-centeredness, and Schreiner and Sjoberg link this to a lack of concern with the large scale processes:

> When the prevailing public concerns of our time are connected to individualization, identity formation and self-actualisation, societal and global developments may be perceived as of little consequence.

(Schreiner and Sjoberg 2005, p. 73)

Shultz et al. (2005) ran a cross-cultural study (including New Zealand) looking at the relationship between values, attitudes and environmental behaviour. It supported other studies’ discoveries that environmental concern is positively correlated with values relating to self-transcendence (goals not directly tied to self-interest – equality, unity with nature, broad-mindedness and a world at peace) and negatively correlated with self-enhancement (goals directly related to self – success, social power and wealth). As long as young people’s actions are motivated mainly by the benefits to them as individuals, rather than as a member of a global society or ecosystem, principles of sustainability and concerns about global issues like climate change will be sidelined.

b. Emotional involvement

Kollmuss and Agyeman (2002, p. 254) suggest that “the extent to which we have an affective relationship to the natural world” is important in shaping our beliefs, values and attitudes. The more emotional investment we have in a problem, the more likely it is we will engage in pro-sustainability behaviour. Women tend to react more emotionally to environmental problems, and our emotional reactions are stronger if we experience something directly.
Lack of emotional investment can come from a lack of understanding of the issues, but it’s generally accepted that simply providing the information will not help – there is evidence to suggest that we resist perceiving or believing information that doesn’t support our existing values or beliefs. And even if we are experiencing an emotional reaction, we still may not act pro-environmentally, because often the reactions we experience when exposed to environmental degradation are negative, and we may actively try to quell these feelings. Secondary psychological responses (defense mechanisms) aim to relieve us from this negativity, and include denial, rational distancing, apathy and resignation, and delegation of responsibility. Stoll-Kleeman et al. (2001) report on these mechanisms acting powerfully to maintain the attitude – action gap around climate change issues in Switzerland. Another study of Swiss adults concluded that “fear and anxiety of environmental problems has the potential to turn environmental action into a counter-productive activity” (Finger 1993, cited in Sobel 2007, p. 17), and argued for the importance of balancing negative information with possibilities for action. It is possible New Zealand’s young people are simply feeling overwhelmed by the issues, and employing these mechanisms to prevent emotional trauma.

c. Values and attitudes

Both values (“what we hold to be important”) and attitudes (“an enduring feeling about a thing”) are dually influenced by social norms and personal experience (Kollmuss and Agyeman 2002, p. 252). Social psychologists refer to a similar concept that they call the “personal norm” - strongly internalised moral attitudes influenced by social norms (Schwartz and Howard 1980, p. 441).

Experiences in the environment (especially during childhood) have been found (e.g. Finger 1993, and Wells and Leckies 2005, both cited in Sobel 2007) to be important in engendering pro-environmental values, attitudes and behaviours. In New Zealand, where 86% of inhabitants now live in urban areas (Statistics New Zealand 2006), young people are growing up in an environment where encounters with and in the environment are much less frequent. It is possible that this gap in experience will result in younger generations holding the environmental less dear, and thus acting less to protect it.
Attitudes are thought to have only a small impact on actions. Diekmann and Preisendoerfer (1992, cited in Kollmuss and Agyeman 2002) explained this using their ‘least cost’ model - the influence of someone’s pro-environmental attitude on their actions decreases as the perceived ‘cost’ associated with acting pro-environmentally increases. People, for example, will recycle, but are less willing to limit their flying (e.g. Forum for the Future 2008; DEFRA 2008).

Individual values are created within the context of societal values, and both individual and societal values within the context of external influences like the media. In a time when we have little contact with our neighbours, but spend on average 2½ hours a day in front of the television (Statistics New Zealand 2001), the media plays an important role in value creation. The New Zealand public garners most of its information about how to help the environment from mainstream media (Fryer et al. 2008). It’s notable therefore that recent times have seen the ‘greening of the glossies’, with magazines like the New Zealand Listener introducing a ‘Ecologic’ column, the New Zealand Woman’s Weekly running a green issue, and new magazines like Good (‘New Zealand’s guide to sustainable living’) entering the market. Brands like Ecostore are becoming household names, and television programmes like TV3’s Wa$ted and TVNZ’s Off The Radar have been screened during prime time. Even the climate change reporting in top end US newspapers’ - which as recently as 2004 was casting significantly more doubt on the role of anthropogenic emissions - appears now to be in line with scientific consensus (Boykoff 2007). Having said that, Boykoff and Mansfield (2008) found that UK tabloid coverage significantly diverged from the scientific consensus that humans contribute to climate change, and as these papers have ten times the circulation of top end broadsheets, there is concern that a great sector of the population is still receiving mixed messages about climate change. Although no recent research has been done in New Zealand, a 2004 Parliamentary Commissioner for the Environment report articulates concerns that the national media (particularly television, which is very influential) is commercially driven, thriving on controversy and conflict. It is this focus on entertainment value rather than substance that makes it difficult for an understanding of sustainability and environmental issues to be developed through the media (Parliamentary Commissioner for the Environment 2004). Lack of knowledge about the issue amongst journalists, and the fluctuating attention it is paid by the media (Schreiner et al. 2005) compound the problem. Monbiot (2007) points out that, even if
climatic change is reported on correctly, it is of no use in shaping people’s beliefs and behaviour if it sits alongside advertisements that promote unsustainable rates of consumption. Company PR campaigns - designed to establish and maintain “social license to operate” (Nelson and Scoble 2006, cited in Galloway and Lynn 2006, p. 167) – have a huge impact on public perception of climate change. Huntingford and Fowler (2008) point out just how polarised the debate can seem in the environmental sciences department in any bookshop, with titles ranging from *Collapse to Shattered Consensus – the True State of Global Warming*. It could well be argued that, although New Zealand’s media is slowly ‘greening’, and accurate reporting of climate change is rising on the media agenda, there are many aspects of New Zealand’s media that could mean the impact of this ‘greening’ on national values is relatively superficial.

d. Knowledge and awareness

Knowledge appears to play only a small role influencing people’s actions, although people must have a basic level of knowledge of environmental issues and environmentally detrimental behaviours in order to change their actions for the better. Jensen (2002) contends that knowledge could effect more change in behaviour if it were taught in schools in an action-orientated manner that enabled students to “actively appropriate and internalise that knowledge”. Cultural norms and economic incentives or disincentives can cause people to act in a pro-environmental way without any basic knowledge, but such actions are easily reversed.

Although some would suggest that young people ought to know more about climate change than older New Zealanders (being at school at a time when climate change is a big global issue) the aforementioned Household Sustainability Survey suggests that 15 – 29 year olds feel no better informed about environmental protection measures than older New Zealanders, and are just as likely to want more information (Fryer *et al.* 2008). A review of international research focused on climate change education (Schreiner *et al.* 2005) found that, although students do possess some knowledge about climate change, they also hold some common misunderstandings and some alternative conceptions, and there are some missing links in their conceptual understanding. Perhaps more worryingly, students have very little understanding of scientific modeling, and very limited experience in decision making around socio-scientific issues.
Reviewers found a paucity research investigating the extent of students’ knowledge around adequate actions and possible channels of influence, and the extent to which students have an understanding of climate change in broader (social, cultural, political, historical) contexts, suggesting that this may be a reflection of the limited extent to which these areas are covered by schools. No research has been undertaken to ascertain whether climate change is being taught in mainstream New Zealand secondary schools at all, let alone to what depth, in what subjects and at what year levels. The little that is known about climate change education in New Zealand secondary schools is explained in more detail in Chapter 2, but regardless of the extent of their knowledge on the subject, as far as can be inferred from research to date, young people in New Zealand are less likely to act pro-environmentally than their older counterparts (Fryer et al. 2008).

Environmental awareness has both a knowledge-based component and a perception-based component. The non-immediacy of environmental issues like climate change limits our awareness of them, and most of the time “information [to communicate these intangible concepts] will further our intellectual understanding without making a link to our emotional involvement” (Kollmuss and Agyeman 2002, p. 253). To most young New Zealanders sitting in a classroom and reading from a textbook about drought in Africa, climate change is a distant, intangible, abstract concept. To talk about climate change at the local scale is not only delving into areas of science that aren’t well developed, but is touching political nerves that may be sensitive. And it is not just geographic distance that makes the problem of climate change seem remote – inertia in the global climate system means that the full impacts of climate change won’t be felt until some time in the future, lowering the perceived immediacy of the emissions problem (Schreiner et al. 2005). The uncertainties around climate science can also confuse understanding of the issue (Andrey and Mortsch 2000), depending on the way they are portrayed by central and local government and NGOs (Chambers and Rowell 2007) and the media (Boykoff and Mansfield 2008).

There are another two major barriers to our cognitive awareness of environmental problems, both of which are particularly relevant to the climate change example. The rate of climate change is as yet imperceptible at the local level. Citizens do not directly experience it. This makes it hard for the average person to understand and believe (Schreiner et al. 2005), and we’re slow to act when we can’t see things moving. Finally,
while all environmental problems are complex, climate change is particularly so, and this poses a problem for human comprehension of the extent of the challenge (Andrey and Mortsch 2000). This aspect of climate change poses big problems for conventional teaching models, particularly at secondary level, where teaching at secondary level is siloed into subject streams. This is investigated in more detail in Chapter 2.

e. Locus of control and responsibilities

Kollmuss and Agyeman (2002, p. 255) define locus of control as “an individual’s perception of whether her or she has the ability to bring about change through his or her own behaviour”. If someone believes that they do not have the ability to bring about much change, they will not act. In relation to climate change, the sheer scale of the problem, and the temporal delay in the impact of emissions reduction, makes individual contributions seem insignificant (Shreiner et al. 2005).

If someone believes that they have a responsibility to look after or protect the interests of another person or thing, or to fix something they personally have broken, they are more likely to act. In Western society, young people often are not delegated a lot of control or responsibility. In New Zealand, for example, most young people don’t have a lot of decision-making sway until they leave home, or enter employment. Even when they start working, it could be several years until they’re in a position of power. In part because of their economic situation, young people are choosing to defer having children, and rates of house ownership amongst young people are falling (Housing New Zealand 2004). Young people arguably have fewer responsibilities than previous generations, and are thus more likely to focus on themselves and their own material comfort than longer-term goals. Perhaps more significantly in terms of climate change, no one individual feels that they personally are responsible for causing it, and thus are less likely to feel a need to ‘fix’ it through behaviour change (Schreiner et al. 2005). Additionally, the brunt of the impacts will be felt by future generations and those in less developed countries - people perceived as far removed from New Zealand citizens on their hierarchy of responsibility (Andrey and Mortsch 2000).
f. Habit

Kollmuss and Agyeman (2002) do not address the role of habit in preventing pro-sustainability behaviour. Where habit (people’s unconscious everyday behaviour) is strong, the attitude-action gap is large, because although people may hold pro-environmental beliefs, their everyday actions may not be in line with those values (e.g. Kloeckner and Matthies 2004). It follows, therefore, that people may have well-established habits that are not easily changed simply by information aimed at changing attitudes (Dahlstrand and Biel 2006). There is a lot of social marketing literature (e.g. McKenzie-Mohr and Smith 1999) that looks at ways to change people’s habits using personal contact and social reinforcement.

g. Personality traits

Also not discussed by Kollmuss and Agyeman (2002) is the influence of character traits on pro-sustainability behaviour. Multiple studies have found various personality traits can predict pro-environmental values. Hirsch and Dolderman (2007), for example, found that ‘agreeableness’ (compassion, empathy and concern for others) and “openness” (levels of imagination, creativity and openness to ideas) were positively correlated with environmentalism. Thus, it’s likely that young New Zealanders with different personality traits will each exhibit different levels of pro-sustainability behaviour.

Climate change is a large and complex problem, and one that governments can not solve on their own. If we are to avoid devastating climate change, there is a need for citizens all over the world to take both individual and collective action. In New Zealand, despite a relatively high level of awareness about the problem, there is a disturbing culture of apathy and inaction - a phenomenon called the attitude-action gap. This is manifesting itself even amongst young people – those who will be most affected by climate change. The factors that influence the exhibition of pro-sustainability behaviour are, as illustrated above, multiple and complex. There is no ‘quick fix’ that will close the attitude-action gap and result in all of New Zealand’s young people exhibiting action competence on the issue of climate change. But the factors listed above also hint at ways that secondary school education can be targeted to maximise action competency around
climate change issues. Education for Sustainability (EfS) is a movement already in place in the New Zealand education system, and many of its key components directly address factors that contribute to the presence of the attitude-action gap. The next chapter investigates the potential of – and barriers to use of – EfS as a platform for climate change education in New Zealand schools.
Chapter 2

Education for Sustainability and climate change education in New Zealand schools: barriers and opportunities

The attitude-action gap, as described in the preceding chapter, has many implications for New Zealand’s secondary school education. Even before climate change hit the public consciousness, many were arguing that education for pro-sustainability behaviour had an essential role in our schools (Munro and Holdgate 1991). If climate change is indeed the single greatest challenge facing the world today, and there is a need for every human being to start making changes in their lifestyle and attitude, the need for education to promote pro-sustainability behaviour and ultimately action competency, is even stronger. Further, if knowledge alone does not facilitate action competence, then schools’ curricula must reflect the need for a broader approach to climate change education.

Although no study has been carried out investigating the state of climate change education in New Zealand schools, the umbrella Education for Sustainability (EfS) movement has been a focus area for researchers over the past decade. This chapter will investigate the potential relationship between EfS and climate change education. Firstly, I canvas the EfS literature, explaining how the key components of EfS very effectively tackle the attitude-action gap. Drawing on New Zealand-specific EfS research, conversations with New Zealand teachers, and literature focusing on climate change education, I will describe the potential barriers to the incorporation of EfS and climate change education in New Zealand schools, in particular at secondary level. Finally, I will identify possible opportunities that EfS and climate change education offer each other in moving towards schooling that promotes student action competency.

2.1 EfS and climate change education

EfS is increasingly a focus for New Zealand schools. This reflects the changing nature of
international concerns about the environment (Tilbury 1995). Until the turn of the century, the few New Zealand schools that offered any environment-focused tuition, focused on instigating Environmental Education (EE), as per government directives (e.g. New Zealand, Ministry for the Environment 1998; New Zealand, Ministry for Education 1999). These Government documents define EE as

> A multi-disciplinary approach to learning that develops the knowledge, awareness, attitudes, values and skills that will enable individuals and the community to contribute towards maintaining and improving the quality of the environment.  

(Ministry of Education 1999, p. 9; Ministry for the Environment 1998, p. 9)

Both in the literature and in New Zealand Government publications there exists a confusing mixture of terms. These include, but are not limited to, ‘education for sustainability’, ‘education for sustainable development’ and ‘environmental education’ (Huckle 1999). In the New Zealand context, EfS Advisor Tania McLean suggests these should all be treated as being equivalent to EfS, or at the very least, as falling under the EfS umbrella (McLean Mar. 2008), and are treated as such by this thesis.

Although EfS encompasses many of the principles of EE, its scope is broader, including more of the human aspects of environmental issues (Parliamentary Commissioner for the Environment 2004). EfS is more focused on educating for action on the big global environmental issues epitomised by climate change. Climate change, therefore, not only fits naturally into EfS, but arguably, as one of the biggest drivers pushing the world to adopt sustainability as a key tenet of future development, it should be one of the most prominent components of EfS.

2.1.1 The key components of EfS

Tilbury (1995) outlined the key components of EfS. As shown below, many of these act to narrow the attitude-action gap, proving that EfS is an ideal vehicle to drive for action competency around the problem of climate change.
a. Relevance

EfS encourages students to engage and grapple with global, contemporary environmental problems, in a way that identifies links between these issues and their own personal lives. The attitude-action gap is in part created when people feel that there is a great distance between themselves and the problem at hand. Helping young people identify the ties between individuals’ lives and global environmental problems will reduce this perceived distance and thus should reduce the attitude-action gap.

According to Smith (2007), place-based education is very important at a time in history when media increasingly draws young people's focus away from the local. To create possibilities for students to participate in real-world problems as they play out within their community is to cultivate a familiarity with, and influence on, processes at the local level, as well as merging the social and environmental dimensions of education, reducing the distance between home and school. Pro-sustainability behaviour is likely to increase if environmental problems and impacts are related more closely to the lives of the Me Generation (Schreiner and Sjoberg 2005), and thus brought within an individual’s perceived locus of control and/or sphere of responsibility.

b. Holism

EfS takes a holistic view both in terms of its content and in terms of the way it is taught. It recognises that environmental problems and social problems are interdependent, and looks at the way aesthetic, social, economic, political, historical and cultural factors interact to create them. This human focus is one of the major differences between EfS and EE – EfS acknowledges the importance of social justice in achieving sustainability (Tilbury 1995).

In relation to content, a holistic approach to climate change education has the potential to invite consideration of the role that social and cultural norms play in the attitude-action gap.

Agenda 21, adopted by 179 countries (including New Zealand) states that to be effective, EfS must be integrated into all disciplines (UNESCO 1992). EfS, it argues, can draw on skills from all aspects of the traditional curriculum to find new solutions to existing
environmental problems – certainly the case for climate change, which requires individuals to possess a diverse range of skills to adequately tackle the problem with direct and indirect pro-sustainability behaviour. Further, because individuals' value systems and social and cultural norms are both created in part by external influences, if EfS is the 'norm' in all parts of the school curriculum, then it is more likely to be internalised as a norm by individuals.

A whole school approach to EfS is widely considered to be best practice, and has been promoted in New Zealand both as a way of spreading the responsibility of EfS promotion throughout the school, and of as a way of ensuring a schools and their communities develop a strong commitment to sustainability (Bolstad et al. 2004). A whole school approach involves environmentally sound organizational, operational and curriculum objectives worked towards through a framework of policies, programmes and practices. A whole-school approach is advocated by the Guidelines for Environmental Education (hereafter referred to as the Guidelines), as it ensures a consistent, coherent learning environment (New Zealand, Ministry of Education 1999). In terms of promoting action competency on climate change issues, such coherency is a useful tool – it encourages the development of action competent social norms and habits, as well as reinforcing knowledge and awareness of the issue at every possible opportunity.

c. A values focus

Tilbury (1995) explains that EfS not only teaches about values, but actively aims to imbue students with “a deep concern for the common good, a sense of responsibility for maintaining a balanced and healthy ecosystem and a strong drive to achieve harmony with nature” (UNESCO 1990, p. 191) – in other words, pro-sustainability values. EfS practitioners actively promote pro-sustainability values, and students must learn about and consider alternative values, understand the environmental consequences of their own values and others’ values, and express the reasoning behind their own value system. This values focus could increase students' awareness of the way demographic and external factors influence both their own values, and those of others, increasing their action competence around climate change as they become more aware of the control they have to manage these external influences.
d. An issues focus

Tilbury (1995) identifies the primary focus of EfS as the involvement of students in the resolution of environment and development issues. The *Guidelines* lists a wide range of possible issues to be used in schools, including climate change, and suggest that schools consider issues at multiple levels - school, local, national and global (New Zealand, Ministry of Education 1999).

If an issue like climate change is studied at multiple levels with an eye to problem resolution, it has the potential to complement ‘relevance’ by reducing perceived distance, tying problems and impacts more closely to the lives of the Me Generation, and bringing solutions within an individual’s perceived locus of control and/or sphere of responsibility, thus increasing action competence.

e. An action focus

EfS challenges students not only to make changes to their lives at an individual level, but to take action directly through eco-management and discriminatory consumerism, and indirectly through lobbying, negotiation, persuasion, and political and legal action, all at the community level (Tilbury 1995). Pro-sustainability behaviour is the ultimate aim of action competency. Encouraging young people to exhibit pro-sustainability behaviour may increase the chance that these behaviours become habitual. More desirably, people who spend time within and acting for the environment at an early age have been shown to possess more pro-sustainability attitudes and values, likely a result of emotional engagement with the issues. As well as that, if the curriculum encourages students to actively participate in community-level action, it “provides a starting point for uninterrupted in lifelong learning across the presently existing boundary separating formal schooling from everyday life outside school” (Roth and Lee 2004, p. 263).

f. A socially critical approach

Because the roads to sustainability are debated even more hotly than the concept of sustainability itself, Tilbury (1995) argues that a socially critical perspective, enabling students to fully develop their political literacy, is imperative. If students are able to
critically assess (in the light of their contribution towards a sustainable society) social and cultural norms, and the motivations, priorities, values and attitudes and perceived responsibilities affecting both themselves and others, it is more likely that they themselves will become action competent in relation to climate change.

g. A three-fold approach

Lucas (1979) described three dimensions of EE. These have been adopted by EfS and are at the core of New Zealand’s aforementioned Guidelines. The first dimension, education in the environment, is described as “experiences beyond the classroom in both natural and built environments” (New Zealand, Ministry for Education 1999, p. 14). Education about the environment is the second dimension, described as “knowing about and understanding the natural and built environments and appreciating the key social, political, ecological and economic factors that influence decision making on local, national and global issues” (New Zealand, Ministry for Education 1999, p. 14). The final dimension is education for the environment, which “deals with people’s emotions and their willingness to make lifestyle choices that help maintain and improve the quality of the environment” (New Zealand, Ministry for Education 1999, p. 14). The Guidelines specify that EE should address all three dimensions. Many commentators suggest that teaching can be considered genuine EfS only when it integrates this third dimension, because education for the environment is transformative – it changes behaviours, attitudes and values (Fien 1993, Greenall 1980, McLean 2002, Robottom 1987).

Although it can be seen that all three dimensions have their place in educating for action competence, once again there is the problem that ‘environment’ can be interpreted in many different ways (Sauve, 1996). In terms of climate change, and in the interests of clarity, perhaps New Zealand’s Guidelines could be revisited with the aim of couching the second and third dimensions in terms of sustainability – education about sustainability and education for sustainability?
h. A futures focus

EfS helps students through the process of identifying probable and alternative future states in the face of current environmental practices, followed by the actions they can take to move towards the most sustainable of these futures. Jensen (2002) identifies two “landscapes of knowledge” (Jensen 2002, p. 331) around environmental problems. Traditional EE, he argues, often concentrates only on the effects of environmental problems (although it could be suggested it also looks generally at causes). EfS is broader, taking in causes and effects but looking also at alternatives or change strategies, and visioning.

A futures focus combined with a socially critical perspective helps students identify unsustainable values, attitudes and norms within their community. It also has the potential to expand the student’s perception of their own responsibilities, and extend the thrust of their motivation and priorities into the future.

In relation to promoting action competence around climate change issues, all features of EfS complement and augment each other. For example, a good understanding of others’ value systems could help a student more effectively carry out indirect action to reduce a community’s carbon footprint.

2.2 Barriers to the incorporation of EfS and climate change education into New Zealand schools

Because of the way that EfS so directly targets the determinants of the attitude-action gap, it has the potential to be a highly effective platform for climate change education in New Zealand schools. There are, however, multiple barriers to the inclusion of EfS, particularly in New Zealand’s secondary school curriculum. The barriers fall into three main categories – theoretical, structural (time constraints, curriculum constraints) and epistemological (lack of teacher training, lack of resources).
2.2.1 Theoretical constraints

a. Concern about the focus of EfS

There is some concern in the literature about the focus of EfS on educating to achieve a particular societal goal. “Should education aim to advance particular ends...and is it the job of education to make people think, believe or behave in a particular way?” (Jickling and Spork 1998, para. 36) These theorists believe education should follow the more traditional, conservative route of simply disseminating knowledge, educating for critical examination of theories, but not advocating any one outcome (Jickling 1992). This view is rebutted by those who feel that no education is value-free (Fien 1993, Fien and Trainer 1993) and by those who believe that certain values (e.g. peace, democracy, human rights, equity and environmental protection) are universal, and that schools therefore have an obligation to teach for social and moral action (Schreiner and Sjoberg 2005, Schreiner et al. 2005).

b. Concern about the overwhelming nature of the problem

Others argue that by burdening young people with the world’s problems at an early age, we risk overwhelming the world’s youth with a feeling of powerlessness, resulting in apathy and inaction (Sobel 2007). Arguably, though, especially in relation to climate change, young people are already inundated with negative future scenarios. The media, which significantly influences our thinking, tends to emphasise the potential cataclysmic impacts of climate change, and dedicates little time to in-depth coverage of the underlying causes, and potential community-based solutions (Parliamentary Commissioner for the Environment 2004). Social norms repress discussion about climate change and the lifestyle changes necessary if we are to avoid atmospheric greenhouse gas concentrations from reaching dangerous levels, and amongst the general population, there is a tendency towards global future pessimism (Heilbronner 1995). EfS, with its focus on preferred futures, shows potential as a way for young people to work through feelings of despair towards empowerment. Hicks and Holden (1995) draw on the work of Boulding (1988) and others who argue that societies with only negative images of the future will decline, whilst those that envision positive futures have a goal to work towards.
Schreiner and Sjoberg (2005, p. 58) report on the many studies that have found youth perceptions about the future of the globe to be highly pessimistic compared with perceptions of their own personal futures, which are relatively optimistic. “The further the images go from the personal level, the darker and more hopeless they get.” If links are made, as is the intention with EfS, between global environmental problems and action that students can take at the individual and community level – a level at which students obviously feel they can exert more control - then the potential for empowerment is strong. Schreiner et al. (2005, p. 11) take advocacy of individual action one step further, suggesting that “depriving a person of the chance to fight the serious problems s/he realises are coming, may lead to feelings of alienation, powerlessness and meaninglessness.” Thus the problem lies in the way climate change is taught to students. Because EfS is action-oriented and future-oriented, it has the potential to be a solution.

2.2.2 Structural constraints

a. Curriculum-related constraints

In New Zealand, as in most countries, the aims and priorities of education, and the basic curriculum skeleton, are determined by the government (New Zealand, Ministry of Education 2007b). In recent years, Western governments have increasingly focused education on preparing students to be participants in a globalising knowledge economy. This has seen increased emphasis placed on mathematics, science and technology, and on internationally recognised standard measures of student achievement like literacy and numeracy. Less tradable disciplines and less measurable skills have been relegated to the periphery of formal education (Stevenson 2007). In New Zealand, this trend is being followed by the current government, who have cut funding for EfS and introduced numeracy and literacy tests for senior primary students (Tolley, cited in Neems 2009). These trends help explain why the acquisition of skills like action competency around climate change are still low priority in many schools. While numeracy and literacy are easily examined and measured skills, it is difficult to measure students’ action competency within traditional assessment timeframes and regimes. Such competencies may not be wholly evident until well after a student’s schooling concludes. In addition, secondary school curricula are to a certain degree also influenced by the qualifications
As long as universities demand qualifications in traditional subjects, ‘new’ disciplines will be sidelined in schools. Shor (1992) argues that such a standardised curriculum and assessment regime essentially manifests itself as commodification of knowledge. Students perceive their knowledge as a tool for personal financial gain rather than for social change and/or intellectual and emotional development.

As a result of all this, under the New Zealand Curriculum, EfS is a non-mandatory, cross-curricula theme. This has a few implications. Firstly, assessment of its implementation is rendered difficult (Parliamentary Commissioner for the Environment 2004). Secondly, the degree to which EfS is incorporated into the curriculum at any one school is dependent on that particular school’s Board of Trustees (New Zealand, Ministry of Education 1999) and, essentially “there exists both the possibility for schools to incorporate much relevant EE/EfS, or to ignore it completely” (Bolstad et al. 2008).

Finally, EfS has to compete for space in what many teachers already believe is an overcrowded curriculum, and in most cases it is up to individual teachers, if they support EfS, to find a place for it within their course content (Bolstad et al. 2008). The 2002/2003 Critical Stocktake of Environmental Education in New Zealand schools found that, while some teachers consider EfS a valid extra, many perceive it as an add-on which they struggle to include alongside compulsory content and other government initiatives (Cowie et al. 2004).

The 2002/2003 Critical Stocktake concluded that, of the secondary schools practicing EE, most were incorporating it into the science and social science curricula (Cowie et al. 2004). Jensen (2002) argues that environmental problems, including climate change, are grounded in the structure of society and in people’s ways of life. Their causes and solutions and the challenges they pose are complex, and cannot be isolated to just one of the traditional academic disciplines that make up the secondary school curriculum. This is problematic, as secondary school subjects are conventionally taught independently of one another (Schreiner et al. 2005). The science curriculum provides a good example of the ‘siloed’ nature of New Zealand’s secondary school education, and a case study for some of the debate surrounding the way EfS should be incorporated into mainstream subjects. Hodson (2003, p. 649) neatly summarises the problem: “School science courses, especially in the later years, continue to be dominated by the basic disciplines
of physics, chemistry and biology. There is very little in the way of integration and, in many countries, scant attention given to the earth sciences and environmental science.” Secondary school science as it stands, although preparatory for those wishing to become scientists, or those wishing to pass tests (Millar and Osborne 1998), tends to focus on “accepted, consensual science or ready-made science” (Chambers and Rowell 2007, p. 61). Barab and Leuhmann (2002) note the growing disparity between science as it is taught in classrooms, and science as it interests and is needed by future citizens. They claim that there is a desperate need for a shift in the focus of science education, from the acquisition of formal science content to project-based, participatory learning. Jenkins (2003, 2006) makes a strong case for ensuring science education is relevant to students' lives. Others argue for incorporation of environmental issues in science curricula simply because of their potential to develop students' critical thinking (e.g. Balcaen 2007).

There is some concern in the literature, especially in science circles, that an action-oriented education waters down curriculum content. Bishop and Scott (1998, p. 225) for example, make a case for a “scientifically attentive conception” of EfS, contending that focusing on action competence can “undervalue the place of science in the construction of knowledge and understanding of environmental issues”. Roth and Lee (2004), counter this argument, suggesting that student participation in community projects is essential. It is only then, they argue, that students learn how to apply science in real world contexts. It's there that science can play out as uncertain or contentious, or as just one part of a complex solution - completely different from the uncomplicated science found in classrooms. Jensen (2002) argues similarly that, because of education's traditional focus on dissemination of knowledge 'about' the environment (confirmed in the New Zealand context by Cowie et al. 2002), students have seldom been provided with opportunities to actively appropriate and internalise the knowledge (education 'in' or 'for' the environment). Indeed, some commentators have advocated for a reduction of obligatory curricula content so as to enable teachers space for in-depth discussions and investigations (Breiting 1999), and to secure a more central place for climate change education (Schreiner et al. 2005). Schreiner et al. (2005) do admit, however, that traditional secondary school culture is strong and resistant to widespread and lasting reforms. They advocate for development of more opportunities and strategies for cross-curricular projects, rather than an integrated curriculum.
Christchurch Girls’ High School was one of the first schools in New Zealand to introduce an EfS course drawing on NCEA Assessment Standards from other subjects (effectively a cross-curricular course). In 2003 they introduced a Year 12 course called Sustainable Futures. The instigators felt that their mainstream subjects (Biology and Geography) were failing to instill in students knowledge, awareness, values, attitudes and skills in relation to action for the environment. The course, which they aimed to make transformational and participatory, still needed assessments in order to student enrollments. It incorporated Social Studies, Biology and Science Assessment Standards, but the practitioners soon found that in many cases Assessment Standards specific to different curriculum areas were too prescriptive for use in a cross-curricular course (Papprill, 2004).

The siloed nature of New Zealand’s secondary school education also significantly reduces the ability of schools to adopt a whole school approach to EfS. Enviroschools is the only nationwide programme that promotes the whole school approach, via facilitation and an awards scheme, and thus is thought to represent the majority of schools practicing the approach. It can be further be assumed that all secondary schools enrolled in the programme (70 - 21% of New Zealand secondary schools at the end of 2008 (Enviroschools 2008)) at least have the intention to develop a whole school approach. The exponential growth in the number of registered secondary enviroschools since the program went nationwide in 2003, is indicative of increasing interest and demand amongst schools for support to help them develop a whole school approach to EfS. However, the limited number of secondary schools gaining higher level awards within the programme suggests that they may find development of whole school approaches more difficult than their primary counterparts (Bolstad et al. 2008), and although no research has been done to establish the reasons for this, structural constraints are likely to play a major role. As Government funding for the programme has recently been cut (Neems 2009), it’s unclear whether the programme will be able to continue growing.

The opportunities in New Zealand for cross-curricular projects and a more whole-school approach have been enhanced by the implementation of the new National Certificate of Educational Achievement (NCEA) and the introduction of the EfS Achievement Standards. In theory, NCEA allows students and teachers to pick and choose senior
assessments appropriate to their course content. EfS Achievement Standards were introduced to provide an assessment framework that helps teachers justify inclusion of EfS in teaching, and were kept deliberately broad so as to encourage their uptake (and thus the spread of EfS) right across disciplines.

The new New Zealand Curriculum also provides an opportunity for more cross-curricula projects, advocating for “a broad education that makes links within and across learning areas”, encouraging students to “look to the future” by exploring “significant future-focused issues” including sustainability and citizenship (New Zealand, Ministry for Education 2007, p. 9).

Climate change education seems to be facing very similar problems to EfS in terms of finding room in the New Zealand curriculum. An international review of climate change education research blamed the large gaps in students' climate change-related knowledge and skill sets on a lack of the topic in curricula (and a similarly low profile in teaching resources) (Schreiner et al. 2005). Although no formal investigation has been conducted to establish the extent to which climate change education is being implemented at secondary school level, let alone the focus and nature of this education (confirmed by Minister for Education Chris Carter, Aug. 2008), teachers that I spoke to whilst conducting this research almost unanimously placed climate change education, like EfS, within the science and social science curricula at junior secondary levels. At senior levels, they spoke about its inclusion mainly in Environmental Science, Biology and Geography. However, even within these subjects, climate change was often reported as only being briefly or informally touched on:

“It's not a high priority / other topic areas are more important.”
Teacher of Science and Physics at a decile 10 private boys' secondary school in Canterbury

“I haven’t really covered climate change as a topic specifically (although it sometimes comes up as a discussion point in Year 9 Social Studies, e.g. in current events). It’s not relevant to Media Studies (although could look at how the media represents climate change issues at [NCEA] Level 2).”
Teacher of Social Studies, Journalism and Media Studies teacher at a decile 6 girls’ state secondary school in Waikato
“I refer to it and discuss with my classes in an informal way. [It’s] not formally taught.”

Teacher of Social Studies, Geography and Tourism at a decile 5 girls’ state secondary school in Otago

“It’s used in Social Studies, but not in much depth.”

Teacher of Social Studies, Geography and Tourism at a decile 8 co-educational state secondary school in Canterbury

Despite many of the aforementioned EoS Assessment Standards providing a good assessment framework for climate change education, many of the teachers I spoke to still cited a lack of appropriate Assessment or Unit Standards as a reason for not including climate change in their teaching:

“We don’t teach [climate change] as such as there are no Unit Standards and we are driven by them.”

Teacher of Mathematics and Rural Studies at a decile 7 co-educational state secondary school in Southland

“I am teaching a Year 12 Environmental Science course next year and would love to do a big section on climate change. However, there are no Achievement Standards that support this. It’s very frustrating.”

Teacher of Science, Horticulture and Biology at a decile 8 co-educational state secondary school in the Manawatu

This would suggest many teachers are either still unaware of EoS Achievement Standards, or are unwilling or unable to use them. However, some teachers I spoke with reported incorporating climate change education into subjects that EoS has conventionally struggled to break into. At a decile 9 boys’ state secondary school in Otago, climate change education is being incorporated into Year 11 and 12 Agriculture and Horticulture courses. A Physical Education teacher from a decile 8 co-educational state integrated secondary school in Nelson spoke of climate change being the subject of a student dance performance. And a Home Economics teacher from a decile 6 state integrated girls’ secondary school in Auckland explained that she was discussing climate change in relation to multiple Achievement Standards at both NCEA Level 2 and Level 3.
The limited inclusion of climate change education in the nation’s curriculum, means there is a high possibility that mass media is the main source of information on climate change for many young New Zealanders. Such a conclusion is extremely concerning in light of the media’s poor record of climate change communication.

b. Time-related constraints

As illustrated above, many of the curriculum-based barriers to practicing EfS in New Zealand’s schools manifest themselves in the classroom context (particularly in secondary schools) as time constraints. As suggested by Barab and Luehmann (2003, p. 455), “implementing project-based science curriculum is challenging in the context of standardised tests, 45-min class periods, large class sizes, and the emphasis on individual grades.”

In addition to this, with EfS in general, two of the three dimensions (education ‘in’ and ‘for’ the environment) ideally involve visits to places outside of the classroom. Quite apart from the challenge of fitting EfS into ‘overcrowded’ curricula, the structured nature of secondary timetables (short teaching periods dotted through the week) is prohibitive to significant learning experiences outside the classroom (LEOTC). LEOTC also require much in the way of preparation and paper work (Haddock 2008), which is understandably off-putting for teachers snowed under with paperwork related to compulsory content and assessment. Almost a quarter of respondents to the 2002/2003 Critical Stocktake of schools thought to be practicing EE stated that they needed more time to set up and maintain projects (especially education ‘for’ the environment), and to plan with colleagues (Cowie et al. 2004).

2.2.3 Knowledge and resource constraints

a. Lack of knowledge

EfS is a relatively new field of education, especially here in New Zealand. Most teachers currently practicing in schools moved through an education system that did not feature EfS (Bolstad et al. 2008). 48% of respondents to a 2002/2003 survey of schools thought to be practicing EE reported having had no EE training at all, and just 6% reported
having had pre-service training. Just under half of respondents reported familiarity with the Government’s *Guidelines* (Cowie et al. 2004) - a document released in 1999 with the aim of helping teachers identify opportunities within the curriculum to teach EE (New Zealand, Ministry of Education 1999). Most of those who reported familiarity with the document also considered it useful. Crucially, familiarity with the *Guidelines* was significantly correlated with respondents having had training in EE (Cowie et al. 2004), underlining the important role of teacher professional development in ensuring EfS reaches the classroom.

A more recent report recommends that the *Guidelines* be re-written to better reflect current thinking about EfS and the way it can fits into the new curriculum (Bolstad et al. 2008). Indeed, the concurrent presence of the term EE and EfS in New Zealand could confuse teachers, especially in the absence of training. This same study found that pre-service teacher training in EfS was in 2006 still piecemeal at best, and that many trainees had no EfS training at all. Further, that few school staff were being offered in-service EfS training, and only some were taking it up. Lack of teacher training, coupled with the non-mandatory status EfS currently has, is seeing EfS left out of school curricula, and / or the burden of EfS implementation falling on one or two trained and passionate staff members. Calls are mounting for greater professional development for teachers in the area of EfS, not only in the literature (e.g. Cowie et al. 2004, Parliamentary Commissioner for the Environment 2004, Bolstad et al. 2008), but from teachers themselves - 27% of respondents to the 2002/2003 *Critical Stocktake* asked specifically for additional professional development (Cowie et al. 2004).

New Zealand’s poor educational record in terms of climate change education specifically can, as with the EfS umbrella, in part be put down to poor teacher training. Of the limited EfS professional development currently being offered for teachers, very little concentrates on climate change. Most in-service training opportunities focus on the topic of ‘waste’, and on EE/EfS in general. Although both could support climate change education indirectly (promoting education for pro-sustainability behaviour, and general EfS education respectively), neither are likely to directly enhance teachers’ ability to educate for action competency on climate change issues. Interestingly, climate change is rated highly on the list of topics school staff would like to have more professional development in (Bolstad et al. 2008). This is hardly surprising, given ever-increasing
awareness of the issue’s importance, but teacher demand for further training could also be attributed to the topic’s rapid evolution. The world’s understanding of climate change, like many of the topics that fall under the EfS umbrella, is constantly improving. It is therefore not just one-off professional development sessions that are required, but ongoing, readily accessible teacher training to keep practitioners up to speed with developments in the area.

Schreiner et al. (2005) contend that for many teachers, climate change education for empowerment is difficult. They are required to step outside familiar curriculum content and facilitate discussion on topics that may well be outside of their range of knowledge or their discipline, using teaching techniques that relinquish a good deal of teacher control. This, they argue, takes a good deal of courage and effort. Hicks and Holden (2005) looked at the preparedness of trainee teachers in England to teach global issues, including environmental problems. Many teachers indicated that they lacked confidence when dealing with students’ fear, judging the appropriateness of material (especially for different age groups), judging whether they themselves should state their opinion, or be neutral, when dealing with sensitive or controversial issues, and the reaction of parents to these. One of the teachers I spoke to whilst writing this thesis talked about the difficulty of working with students in denial of climate change –

“I had a Year 9 class this year, some of whom were climate-change deniers – not sure I made much impact on their quasi-religious beliefs!”

Teacher of Science and Biology at a decile 6 co-educational state area school in Southland

Hicks and Holden’s (2005) study also found that teachers felt unsure when attempting to facilitate meaningful discussion. Although no such work could be found in the New Zealand context, the instigators of the Christchurch Girls’ High School Sustainable Futures course reported that their students didn’t adapt readily to the participatory approach the course aimed to cultivate. They blamed this on the fact that students were used to a more teacher directed model of education (Papprill, 2004). It would seem that ongoing professional development for teachers is needed not only to enhance basic knowledge of issues like climate change, as argued above, but also to ensure teachers are confident in pedagogy that allows students to engage with the issues in a way that promotes critical analysis and participation, and ultimately action competency (Bolstad
et al. 2008, Cowie et al. 2004, Parliamentary Commissioner for the Environment 2004). If such pedagogy is adopted in all classrooms, students would be better prepared to learn about complex issues like climate change, and to apply their knowledge to similarly complex or controversial situations outside of school.

Quite apart from their knowledge of, and willingness to try the topic or pedagogy, teachers themselves are not immune to social and cultural norms, nor are they immune to the multitude of other factors that influence the existence of the attitude-action gap. Stevenson (2007, p. 272) points out that teachers have their own “assumptions, beliefs and values about schooling, knowledge, teaching, students and learning ... and the environment”, and that their teaching will align with these (often subconscious) theories. Teachers, like students, are also subjected to external discourses about environmental problems (Schreiner et al. 2005). Teachers may be weighed down with concern about climate change, or experiencing secondary psychological effects like apathy or denial, making it difficult for them to help students engage with the issue in a way that enhances action competence. Barrett (2007) contends that cultural and social norms may also play out indirectly in the classroom to prevent teachers expressing themselves freely, particularly in regards to emotional aspects of environmental issues, thus frustrating their attempts to engage students emotionally with a problem like climate change.

Once again, such problems should in most cases be overcome with appropriate teacher training. If teachers are able to identify the internal and external factors that determine their own beliefs, appreciate the links between these and the direction and nature of their teaching, then they are more likely to identify ways to deal with them in the classroom so as not to stifle students' learning processes.

b. Lack of additional resources / support

Although provision of professional development is a crucial and highly underutilised means of promoting EfS (and thus climate change education) in New Zealand schools, there are a number of other resourcing and support factors that also require attention.

37% of respondents to the 2002/2003 Critical Stocktake of schools thought to be
practicing EE requested more teaching and learning resources. They further specified that these should be cross-curricular, and easily adaptable to local contexts. Other suggestions included that they be pupil friendly, easily integrated with other curriculum areas, and made available on Te Kete Ipurangi (New Zealand’s Ministry of Education administered school resource site) and through Learning Media (New Zealand’s Ministry of Education publishing house) (Cowie et al. 2004). While there is a profusion of climate change resources online, many of these are very science-heavy, broad in scope, out of date, or difficult to access. Teachers I spoke to whilst writing this thesis talked in particular about the need for more New Zealand focused climate change resources, and about the difficulty of keeping resources up to date with the rapidly evolving science –

“There are few text resources relating to New Zealand and most DVD clips are from the TV news. There is a need for New Zealand-based resources.”

Teacher of Social Studies, Geography and Tourism at a decile 6 co-educational state secondary school in Otago.

“It’s hard to keep up and to know ... which resources are any good – they get out of date so fast.”

Teacher of Social Studies and Geography at a decile 8 state integrated girls’ secondary school in Hawkes Bay.

Resources on climate change are produced mainly by central and local government, and by NGOs. Chambers and Rowell (2007) point out that both these resources, and the teachers that rely on these resources, are viewed as authorities on the subject in the classroom context. Because of this, both the language used in the texts and the position taken by the authors are influential and political. Their study investigated the treatment of uncertainty in climate science within various school resources used by students in Alberta, Canada. It found that varying discursive management of uncertainty within these texts constructed “competing realities” of climate change (Chambers and Rowell 2007, p. 67), and the responses or actions required. Because climate science is “science-in-the-making” (Chambers and Rowell 2007, p. 65) it does challenge expectations of certainty, especially in disciplines where there has traditionally been more of a focus on dissemination of known ‘facts’ (Chambers and Rowell 2007). Some teachers are able to negotiate resource shortage and/or competing realities:
“I am not aware of many resources available so I just start discussions on what I know, what the kids know and that leads to research to find out more and predictions of what our futures might be like!”

Teacher of Technology, Home Economics and Food Technology at a decile 6 state integrated girls’ secondary school in Auckland

But it challenges others:

“Who do we believe?”

Teacher of Mathematics and Rural Studies at a decile 7 co-educational state secondary school in Southland

Cowie et al. (2004) report on a similar problem some teachers experience when engaging community groups to help with the teaching process. Mismatched expectations and goals mean that some teachers are frustrated by learning outcomes. Many community groups and NGOs have their own agendas, and few are familiar with teaching processes, which means their role in classrooms must be managed carefully. But because climate change is an area where decisions need to be made when the science is still emerging and is constantly and rapidly evolving, both resources and outside experts are as indispensable as they are intrinsically political. Climate change education calls for a new pedagogy, where students’ primary focus is on critically analysing the information and viewpoints supplied by numerous sources, before deciding on a course of action. Once again, professional development for teachers could ensure they are confident in helping students to negotiate conflicting information and positions by identifying potential source bias.

Bolstad et al. (2008) found that, within the EfS sphere, much interaction between school and community is occurring with a wide range of community members, including but not limited to parents, regional councils, NGO’s and EfS advisors. These interactions most commonly involved the provision of resource material. It is interesting to note, however, that once again the most common topics for interactions were based around ‘water’ and ‘waste’, or ‘EfS’ more broadly. Climate change specifically did not form the

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1 Government-funded advisors attached to tertiary institutions around the country, provided support and guidance for teachers and schools practicing EfS. Funding for these positions has just ceased (Neems 2009).
basis of any reported interactions. Given the rapidly changing nature of the topic, and the expressed desire of teachers for more professional development on the issue, it seems strange that schools are not utilising groups external to the school as sources of information on climate change. This may reflect a lack of expertise and/or developed resources around climate change within the wider community.

The need for support is not limited to provision of teaching resources. Responses to the 2002/2003 Critical Stocktake suggest that support from school management and staff is crucial, especially for cultivating relationships with external community organisations, and for keeping programmes running over an extended period of time, or school-wide (Cowie et al. 2004). Too often, EfS’s non-mandatory status puts it low on a school’s priority list, and it falls to one or two passionate teachers to lead the EfS drive. Raising the profile of, and level of support for EfS could be aided by increased Education Review Office reporting. ERO reports are used by schools to determine areas that they are excelling in, and areas that they need to improve on. Currently levels of reporting on EfS activity appear to be very low, which may play a role in keeping EfS low on school managements’ priority lists (Bolstad et al. 2008).

Finally, 21% of respondents to the 2002/2003 Critical Stocktake asked for more funding for equipment and projects (Cowie et al. 2004). Funding for EfS in schools is often lower compared with that for core subjects (Parliamentary Commissioner for the Environment 2004), which is unfortunate given the relatively high cost of experiential learning ‘in’ the environment.

Although the principles of EfS tackle very well the attitude-action gap, the extent and breadth of the theoretical, structural and epistemological barriers to the implementation of EfS poses obvious challenges for its use as a platform for climate change education in New Zealand schools. The current focus of most EfS seems to be on narrowly defined focus topics like ‘water’ and ‘waste’. In addition to these challenges, although EfS has gained traction in the secondary system, assisted by the growth in the Enviroschools programme, the introduction of EfS Achievement Standards, and employment of regional EfS advisors, recent government budget cuts have removed a lot of this support.
2.3 Opportunities for EfS and climate change education in New Zealand schools

As explained above, climate change is an issue building in importance and gaining attention amongst New Zealand teachers, who are asking increasingly for resources and support on the subject. Evidently there exists a big opportunity for practitioners developing climate change resources to do so in a way that keeps the principles of EfS at their core, but overcomes some of the barriers EfS has traditionally faced. Such an approach would not only ensure climate change resources started closing the attitude-action gap, but the use of such resources may help usher EfS theory into mainstream teaching practices across the curriculum.

Little is known about the way climate change is being taught in New Zealand schools, but the better-studied umbrella movement of EfS has been becoming increasingly widespread in New Zealand schools over the last decade. The key components of EfS directly address the attitude-action gap, and thus have big potential to promote action competency on climate change. The implementation of EfS (and thus climate change education, as far as can be ascertained) has run into many barriers, particularly in secondary schools. However, there is increasing teacher demand for both resources and support in the area of climate change. This would suggest that there exists an opportunity for climate change resources and pedagogy to be developed that, while keeping EfS theory at their core, attempt to transcend some of the problems EfS has traditionally faced. The possibility of employing narrative-based resources, in particular film and filmmaking, to extend climate change education (and thus EfS) beyond the traditional science and social science disciplines, and to promote cross-curricula projects, is discussed in the next chapter.
The existence of the attitude action gap around climate change issues and the generally minimal and siloed nature of climate change education (particularly in secondary schools), coupled with the immensity of the projected impacts of climate change on the generation currently moving through the New Zealand school system, means that there is a pressing need for climate change education to be introduced into schools in a way that results in action competency. Spoel et al. (2009, p. 53) explain that for climate change communication to be rhetorically effective, “it must engage audiences in caring about what is being explained ... engaging the whole person through complex and rich rhetorical means.” It is, they argue, “a question of telling stories about climate change that connect the science to people’s everyday knowledge, lives, values and concerns.”

The power of story as an educational tool has long been recognised. In this chapter I will discuss the strength of narrative effect – both epistemological and transformative. I will explain how this narrative effect intrinsically tackles the attitude-action gap, and how careful narrative design can be used to further encourage action competency. I will contend that personal narratives have the potential to play a big role in educating for action competency around climate change issues in New Zealand schools, and that film is a powerful vehicle for exploration of these narratives.

3.1 The power of story

3.1.1 What is story?

Narratology (the study of narrative) has a place within many disciplines, from literary theory to education. A substantial amount of literature exists on the subject (see Mitchell, 1981, for an overview). Discussion of the full extent of the literature falls outside of the scope of this thesis, but I will briefly explain how the term ‘story’ is used here.
Bruner (1986, p. 119) suggests that narrative can be thought of as “a mode of thinking, a structure for organizing our knowledge, and a process for the vehicle of education”. Debate around a more precise definition of story has centered mainly on which components should be considered indispensible – a discussion which is intrinsically subjective and arguably irreconcilable. In their research on the role of narrative in science education, rather than defining narrative, Norris et al. (2005) describe eight narrative elements. An adapted version of these is shown in Table 2.

Table 2: Narrative elements and their meanings

<table>
<thead>
<tr>
<th>Narrative Element</th>
<th>Meaning</th>
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| Event-tokens      | - particular occurrences involving particular actors at a particular place and time  
|                   | - are chronologically related  
|                   | - involve a unified subject and are interconnected  
|                   | - later events seen as significant in light of earlier events  
|                   | - lead to changes of state |
| Narrator          | - the agent relating to a narrative (foregrounded or backgrounded)  
|                   | - determines the point and purpose of the story to be told  
|                   | - selects events and the sequence in which they are told  
|                   | - fashions a sequence of events into a significant whole |
| Narrative appetite| - desire created in readers and listeners to know what will happen  
|                   | - based on a range of possibilities that creates anticipation and suspense |
| Past-time         | - narratives concern the past  
|                   | - narrators can manipulate time in relating narratives |
| Structure         | - narratives typically start with imbalances, introduce complications, and end in success or failure  
|                   | - narratives are structured around two independent time sequences – the sequence of plot events and the sequence in which the events are related  
|                   | - narratives are tied together by satisfying expectations that are established previously |
| Agency          | - actors cause and experience events in narratives  
|                | - actors are responsible for their actions  
|                | - narratives involve human beings or other moral agents  
| Purpose        | - helps to better understand the natural world and humans’ place in it  
|                | - helps to imagine and feel the experience of others  
| Audience       | - the reader must interpret the text as narrative in order to approach it with appropriate expectations and anticipations  

(adapted from Norris et al. 2005, p. 545)

Their assertion is not that each of the eight is essential, but that “a piece of prose is narrative to the extent that it features these elements” (Norris et al. 2005, p. 544). They suggest that there is a hierarchy of importance amongst these narrative elements, and propose that the presence of a narrator and audience, narrative appetite, structure, and purpose are of secondary importance to event-tokens, past-time and agency. I have adopted the concept of ‘degrees of narrativity’, as opposed to a strict definition of story, for the purpose of this thesis, meaning communications can be narrative to a greater or lesser degree depending on the extent to which they incorporate the aforementioned narrative elements. This study is concerned in particular with the power of ‘personal narrative’ - an individual’s “cognitive representation or social communication of events unique to that person.” (Rappaport 2000, p. 4).

3.1.2 Story as an educational tool

a. Epistemological function

Jackson (1995) asserts that the most obvious reason for using stories as an educational tool is their epistemological function - they contain knowledge applicable in the outside world. Mankowski and Rappaport (1995) reiterate this specifically in relation to personal narrative. For them, not telling our experiences means not remembering, which limits the knowledge with which we can approach and adapt to changing environments.
If this were the only reason for the use of stories, however, a collection of useful knowledge would be just as powerful as an educational tool. Above and beyond that of a list or series of statements, the power of narrative lies in its ability to transmit information effectively. ‘Narrative effect’ is a term used to describe the power of story as a means of enhancing memory and understanding of, and interest in, information being transmitted. In their comprehensive review of narrative theory as it relates to communication of science, Norris et al. (2005) suggest that there is ‘moderate’ support for the existence of narrative effect, and cite studies that have shown narrative effect to manifest itself in faster and fuller comprehension of information (Graesser, 1981), an increase in the perceived plausibility and persuasiveness of the information being read (Voss et al. 1999), and in readers applying themselves more closely to the text concerned (Zarbrucky and Moore, 1999).

b. Transformative function

Jackson (1995) goes on to explain a function of narrative beyond that of enhanced information transmission. He is among the theorists that suggest that story has a transformative function. This transformative function has little to do with the transmission of knowledge. It is stories’ ability to change us, to leave us with new or different perspectives, mindsets and value systems, that makes narrative a compelling and influential educational tool. Stories have the power to alter us as individuals (Jackson, 1995). Personal narratives in particular hold a great deal of transformative potential, in part because of the way our lives are structured. Personal narratives are favoured in contemporary Western societies, because of the emphasis placed by these societies on individualism. In addition, personal stories are able to capture the struggles that people living in these societies perennially have in integrating their lives (McAdams 2001).

Above and beyond their ability to navigate Western cultural constructs, there is something powerful about hearing someone else’s personal story. If indeed we do live storied lives (Bruner 1986), to share a story is to share a personal part of ourselves. For a time, listeners are in the privileged position of experiencing another person’s life, weaving the story with their own life narrative, and later sharing the wisdom with others. And as powerful as the experience is for listeners, telling a personal story is a
similarly powerful experience. To share one’s story with an audience whose attention is focused on your experience; to relive events that were important to you, to know that you are, in sharing your story, influencing the life narratives of your audience – this too is a powerful thing. Experiencing a story effectively constitutes a journey into another’s world:

Narrative allows us to enter empathetically into another’s life and being – to join a living conversation. In this sense, it serves as a means of inclusion, inviting the reader, listener, writer or teller as a companion along on another’s journey. In the process we may find ourselves wiser, more receptive, more understanding, nurtured, and sometimes even healed. 

(Witherell et al. 1995, pp. 40 – 41)

3.2 Narrative as a conduit for climate change education

As I discuss below, theorists have dissected the aforementioned epistemological and transformative strengths, and considered the underlying reasons for the power of story. Although it seems likely that the epistemological and transformative strengths of narrative inform and support each other, when the underlying reasons are analysed from the point of view of climate change education, it becomes evident that narrative form has great potential as a catalyst of action competency.

3.2.1 Reasons for stories’ power

a. Stories as humans’ way of experiencing the world

Much of the power of narrative lies in the centrality of story to human experience (e.g. Bruner 1986). Humans are often said to live storied lives – “we are all agents with purposes of some sort whose lives inevitably consist of a series of events situated in time” (Norris et al. 2005, p. 554). Because the basic elements of narrative so closely reflect key elements of each human’s life, the argument follows that narrative is a powerful vehicle for audience comprehension. As humans, we don’t live lists or facts and figures. Our actions and decisions are all made according to narrative structures (Sarbin, 1986). As both learners and teachers, we are storytellers and characters in both our own and
each other’s stories. Education is therefore, at its most basic, the “construction and reconstruction of personal and social stories” (Connelly and Clandinin 1990, p. 2).

In terms of climate change education, throwing startling facts and figures at an audience doesn’t sit readily with their way of knowing or experiencing the world. Communicating climate change issues through story, however, may well package the information in a more readily comprehensible way, appealing to their whole being. This will inevitably enhance an individual’s knowledge and awareness around climate change issues, helping to close the attitude-action gap, but the impacts extend much further than cognitive effect.

b. The power of stories to engage audiences emotionally

The centrality of narrative structure to human experience is arguably inseparable from its ability to engage audiences at an emotional level. Hardy (1968, p. 5) notes that we “dream in narrative, daydream in narrative, remember, anticipate, hope, despair, believe, doubt, plan, revise, criticise, construct, gossip, learn, hate and live by narrative.” Because our emotional responses are lived as narrative, our easy familiarity with narrative form can thus link us back in to rhythms of human feelings during more formal encounters with story (McEwan and Egan 1995).

Carter (1993) explores a story’s relationship with emotion more broadly, focusing on narrative’s ability to hold a great “richness”:

At one level, story is a mode of knowing that captures in a special fashion the richness and the nuances of meaning in human affairs. We come to understand sorrow or love or joy or indecision in particularly rich ways through the characters and incidents we become familiar with in novels or plays. This richness cannot be expressed in definitions, statements of fact, or abstract propositions. It can only be demonstrated or evoked through story.

(Carter 1993, p. 6)

It is this richness that allows audiences to ‘understand’ at another level, a level that invokes the heart as well as the mind. It is possible, for example, to know the extent of melting of the Arctic sea ice in square kilometers, and experience no emotional
response. Narrative theory suggests that it is more difficult to hear a story from a passionate individual about the impact of reduced sea ice on one particular Inuit family, and still be emotionally disengaged. Reknowned UK-based sustainability communications agency Futerra describes the limited ability of humans to empathise with landscapes, and distant, general threats, advocating for climate action marketers to show instead the people and animals in danger, and threats that can be easily imagined (Futerra, 2006). The new climate blockbuster film *The Age of Stupid* (Armstrong 2009) is an excellent example of building emotion into climate change issues with personal narratives about cataclysmic events like Hurricane Katrina. An individual’s emotional engagement with an issue is thus another key determinant of the attitude-action gap that can be addressed using narrative.

c. Narratives’ ability to represent complexity, ambiguity, dilemma and contradiction

Narrative effect and the transformative function of narrative are two good reasons for using stories to communicate climate change content, and thus target the knowledge-based component of awareness on the issue. Effective communication around complexity, ambiguity and dilemma is useful in directly targeting the perception-based component of awareness.

Carter (1993) cites Bruner’s celebrated (1985) paper *Narrative and Paradigmatic Modes of Thought* in explaining the ability of story to deal with complexity and contradiction:

> The knowledge represented in story cannot ... be reduced to abstract rules, logical prepositions, or the covering laws of scientific explanation. Indeed, stories seem to resist singular interpretations and this cannot be subsumed into what Bruner (1985) called paradigmatic knowledge. To elaborate an example Bruner used, paradigmatic or scientific explanation requires consistency and noncontradiction. Story, on the other hand, accommodates ambiguity or dilemma as central figures or themes.

(Carter 1993, p. 6)

An ability to accommodate such themes is useful when communicating climate change for a number of different reasons. Firstly, given the huge complexity of the climate
change issue, and the potential for it to touch every aspect of society, use of a communication medium that is able to hold and convey some of that interconnectedness and complexity is therefore advantageous.

As climate science is “science-in-the-making”, and therefore more ambiguous and uncertain than much of the science that is traditionally taught in classrooms (Chambers and Rowell 2007, p. 65), a medium that allows for a considered study of uncertainty is also valuable. Students need to be provided with space and context to consider and understand what ‘uncertainty’ means to different people and in different disciplines, from the scientific world to the world of weather, and from the economics to the way it is interpreted by the general public in everyday life. If story is able to represent and juxtapose these various kinds of uncertainty, it is indeed a powerful tool for communicating climate change.

As Robinson and Hawpe (1986, p. 112) affirm, “stories are a means for interpreting or reinterpreting events by constructing a causal pattern which integrates that which is known about an event as well a that which is conjectural but relevant to an interpretation.” Narrative (like art) leaves space, therefore, for science that is more conjectural, and for complex relationships between large-scale processes that are difficult to describe using reductionist science. A good example is that of the relationship between consumption and climate change – there are so many complex relationships and so many scale factors to climb through to fully comprehend the true connections between income and shopping and ice melting. I believe these can be more elegantly inferred using narrative than by chains of graphs and statistics.

Finally, as decisions made around climate futures have global impacts and require tradeoffs to be made, the capacity of narrative to communicate a dilemma is also beneficial. Understanding of other determinants of the attitude-action gap (social and cultural norms, values and attitudes) is facilitated by story’s ability to show contradictions in approaches and viewpoints on big issues like climate change. This opens the opportunity for an examination of, and debate around, the implications of social and cultural norms, and of the values and attitudes that an individual or society may hold.
d. Narrative enables study of larger social/cultural contexts

Stories’ ability to enable the scrutiny of social and cultural contexts is not limited to presentation of contradiction. The narratives that people build for themselves are created around the narrative framework of the culture in which they are grounded. Chafe (1990, p. 80) sees these as “prepackaged expectations and ways of interpreting”. Polkinghorn (1988, pp. 153-154) suggests that, although the content of stories is specific to each individual, the characteristics of the “general plot outline” can be attributed to culture. In terms of facilitating action competency around climate change, the ability to identify key cultural “plot outlines” in stories enables discussion of the role of society and culture in determining individuals’ values and attitudes. Even if this discussion is not individual-specific, it has the potential to awaken in each individual an awareness of how he or she might be under the influence of the dominant narrative structure (Bruner 1986), or as Bird (2000, p. x) explains it, a knowledge of the “relational I”.

Deconstructing dominant narratives (reading them from the point of view of “minor characters”) can often reveal that they “terrorise” minorities (Rappaport 2000, p. 3, 5). Rappaport (2000) describes how empowering the release of individuals from an implicitly accepted and enacted dominant narrative (a cultural or social norm) can be. If the dominant climate change narrative in New Zealand, for example, is that the problem is too big for the lay person, and only people in power can do anything about it, it is obvious how disempowered young New Zealanders might be, particularly if the dominant narrative remains unnamed. Identifying such dominant narratives, and talking about their impact on implicated minorities can play an important role in turning “tales of terror” into “tales of joy” (Rappaport 2000, p. 7).

e. Story as a means of experiencing others’ perspectives

If story can be accepted as a study of the “relational I” (Bird 2000, p. x), it is a small step to appreciating its role in assisting in the understanding of other’s perspectives. There is something quite disarming about story. McEwan and Egan (1995, p. xii) describe it as an invitation to suspend skepticism and embrace the story as “an authentic exploration of experience from a particular perspective”. Witherell et al. (1995) suggests that this
experience of the other may be another person, but it may also be another place, time, culture or event. They see narrative as providing a bridge between worlds, allowing the audience to see themselves in the stories of others, affirming our interdependence as a species and as living beings on one planet.

The world-bridging nature of story is useful in addressing many determinants of the attitude action gap, promoting action competency on climate change issues. If story helps bring to life experiences, places or people for an audience, it seems logical that this would assist with the perception-based component of awareness, reducing the perceived distance between Western audiences and people and places affected right now by climate change. In a similar way, if story does indeed reinforce the interconnectedness of everyone’s fate, it can act to broaden audiences’ motivations and priorities, as well as their perceived locus of control and responsibilities. And at a time when the debate on climate change has polarised many Western nations, with climate change deniers going head to head with climate change activists, the potential for an audience to be disarmed by narrative structure enough to genuinely explore another perspective on climate change or climate change solutions, is a particularly useful one. Exploration of alternative perspectives may have a transformative impact on attitudes and values, or on perception of social and cultural norms.

f. Narrative assists with identity development

Identity, according to Mankowski and Rappaport (1995), includes current concerns as well as future visions and selves. The development of identity, they argue, can be seen as the incorporation of shared narratives into one’s own personal life story, coupled with the creation of new narratives or modification of existing ones. Shared stories thus play a role in the constant recreation of others’ stories, and hence in the development of their identity. It seems logical, then, that the telling of stories could in the long term have some impact on individuals’ personality traits – yet another determinant of the attitude-action gap.
g. Story helps with the development and articulation of opinions

McEwan and Egan (1995) argue that the function of narrative is to help us, and others, understand our actions. Furthermore, they argue that our reasoning and thought processes are implicit in the structure of our stories, and thus speak to the perspectives we ourselves hold. Goldberg (1985) contends that, because our belief systems are grounded in some foundational story, most of our serious convicitional disputes are reflections of differences in narrative accounts. So while story is a means of learning about other perspectives, it is also the way that we position ourselves in relation to those perspectives (Worton, 2001). When carried out consciously, storytelling can help an individual consider social and cultural norms, attitudes and values, and their own personal position in relation to them.

h. Narrative can validate action competent ways of being

The whole area of narrative therapy is based on the assumption that the stories that we tell about ourselves shape our understanding of who we are - “our narratives are the means through which we imagine ourselves into the persons we become” (Hopkins 1994, p. xvii). Mankowski and Rappaport (1995) see the role of story as the organization and integration of our past experiences, which helps us to experience our past, present and future lives as part of a meaningful and purposeful journey. They emphasise the importance of the sharing of stories in validation of individual identity. If stories of individuals taking action on climate change are shared widely, it is possible that such stories will help to solidify other individuals’ narratives of empowerment. This process could help to spread action competent values and attitudes throughout the population, and to validate action competent social and cultural norms amongst communities of people, thus celebrating the difference that an individual can make.

3.2.2 Risks posed by the use of story as an educational tool

As with all powerful educational tools, there are caveats. Carter (1993), for example, warns that stories, because of their complexity, and the fact that they resist singular interpretation, teach in ambiguous ways. She highlights the complicating role of the narrator and the fact that no story can be separated from a teller and a time of telling.
Stories, therefore, must be considered in the light of these purposes or interests. McEwan and Egan (1995) consider the potential for stories used in education to conceal or distort perspectives and to promote one position over others. Carter (1993) draws on the work of Martin (1986) to contend that invisible narrators are of special concern because they create the impression that the information is impartial. However, as no education is value-free (Fien and Trainer 1993, Fien 1993), it seems nonsensical to sideline the potential benefits of story in pursuit of some ideological ‘objective’ education. Students must instead be taught to critically analyse not only the information they are provided, but also the intention of the narrator and the potential ways that intention might have influenced the narrative design.

Intrinsically, then, story is not only a powerful educational tool, but its epistemological and transformative potential means it can directly address many of the determinants of the attitude-action gap. On climate change issues, it is capable of imparting knowledge and raising awareness (both knowledge-based and, crucially, perception-based), engaging audiences emotionally, opening discussions about social and cultural norms and their impact on individual decision-making, questioning individual values and attitudes, influencing personality traits, and broadening audiences’ motivations, priorities, perceived locus of control and responsibilities. There are some attitude-action gap determinants that story cannot directly influence (demographic, institutional and economic factors, and habit). However, narrative can be used to raise awareness of them by featuring discussions about their influence as content in the stories. Appropriately designed student exploration and study of stories about climate change – and personal narratives in particular - could play an important role in promoting action competence.

3.3 The importance of narrative design

Stories’ intrinsic potential as a vehicle for action competence around climate change can be enhanced by effective design of narrative. Aristotle’s three modes of rhetorical proof – ethos, logos and pathos – provide a useful framework for narrative design. Ethos is related to the credibility and authority of the narrator. Logos is a logical appeal – facts, figures and statistics that support the narrator’s argument. Pathos is a call to the
audience’s emotions. If narrative communication is to appeal to the whole person, each of these modes must be covered:

The logos of the scientific narrative must be integrated with a trustworthy ethos to scaffold the understanding, and the technical details must be reinterpreted within a framework of cultural rationality that engenders a sense of social significance and personal caring.

(Spoel et al. 2009, p. 77)

3.3.1 Pathos and ethos

A sector of narrative research exists that focuses on narrative as it is used to communicate big picture environmental issues. The communication strategy that typifies the genre is referred to as ‘apocalyptic narrative’. The primary aim of such narratives, as defined by Killingsworth and Palmer (1996, p. 22) is to “transform the consciousness that a problem exists into acceptance of action toward a solution, by prefacing the solution with a future scenario of what could happen if … the problem goes untreated.” In general, allusions to this future scenario aim to trigger an emotional response in the audience.

The 2006 film An Inconvenient Truth (Guggenheim 2006) is a useful case study for exploring the benefits of, and challenges posed by, use of apocalypticism. Employing pathos to support rational understanding is key to promoting audience understanding of climate change. It is apocalypticism that, in the case of An Inconvenient Truth, develops “engaged forms of public understanding” (Spoel et al. 2009, p. 53) which “exceed the narrow bounds of technical rationality” (Spoel et al. 2009, p. 71). But as Johnson (2009) contends, it is through the complex interplay of different rhetorics that a film like An Inconvenient Truth comes to persuade. While apocalyptic rhetoric ensures there is an undercurrent of “undeniable persuasive energy”, this theme “risks compromising audiences’ sense of agency by engendering feelings of powerlessness” (Johnson 2009, p. 30). An overwhelming sense of impending disaster or negativity has the potential to trigger apathy, denial, rational distancing or resignation, instead of action competency. As I discuss in Chapter 1, it is important to achieve an emotional balance in narrative, if action competency is the desired outcome. Overwhelming the audience with negative
emotion to the point that these secondary psychological responses are triggered is inevitably counterproductive to action competence. It is necessary, therefore, for films to temper apocalyptic appeals with scientific rationalism (and/or utilitarian rhetoric) if they wish to promote action competency.

The art of telling an effective story, therefore, is arguably as much about managing an audience’s emotions as it is about interesting content. An audience needs to feel safe to subject themselves to the emotional rollercoaster that is a story. Bruner (2001, p. 41) speaks of the need for stories to be in some regard “typical or characteristic or culture conforming” in order to be understood. Target audiences must be comfortable enough with what is being told, and/or the manner that it is being told to them, that they can appreciate that with which they are not familiar.

Bruner goes on to explain, however, that the unfamiliar is also of immense importance. If there is nothing nonconformist about the narrative, it will not hold our attention. “To assure individuality ... we focus upon what, in the light of some folk psychology, is exceptional (and therefore, worthy of telling) in our lives” (Bruner, 2001, p. 30). The question then becomes, how does one create a narrative that is in some ways culture conforming and yet manages to call into question social and cultural norms? How does a culture conforming narrative resist being subsumed by the dominant cultural narrative? I contend that the key to establishing this balance lies in the choice of narrator.

Killingsworth and Palmer (1996, p. 22) argue that “the most influential apocalyptic narratives do not undertake a wholesale attack on the ideology of progress or its attendant faith in science, technology, and liberal democracy”. Instead, they critique a part of them, and/or do so quietly, advocating action within structures that already exist in society. This is perhaps less of an ideological jump for an average Western audience, and thus may be better received.

Egan (1995), however, suggests the extent to which education needs to be based on student’s every day experience, environment, or interests is overestimated. He argues that narrative can be just as effective if it uses instead the binary concepts that young people also know, e.g. love/hate, anxiety/security, courage/cowardice. He argues that it
is through these profound affective concepts that content can be made accessible and relevant.

Narrative impact will naturally be strongest where there exists both some degree of conformity to the audience’s shared culture, and the presence of profound affective concepts. Personal stories featuring an audience peer as the narrator have the ability to embrace both. A peer can tell of a far off destination or strange experience in a way that the audience can relate to, using language that is familiar to them and linking new concepts back to those which are embedded in the shared culture, or to familiar contexts in which the knowledge can be applied. In terms of climate change, this goes a long way to embedding the science of climate change within a “framework of cultural rationality” (Spoel et al. 2009, p. 77) by demonstrating the impact of the statistics, facts and figures on the social relations that make up the human world. Even when the personal story is not that of a peer, but of a person embedded in a different culture, one could argue that a fellow human’s experiences are more closely related to the audience’s experience than the ‘experience’ of an omniscient narrator. Similarly, it is in personal stories that binary concepts are at their most emotionally engaging. A real person, a peer, a representative citizen (Wells, 1996) speaking of love or hate is much more recognisable and thus more easily imagined by an audience than the love or hate spoken of by an omniscient narrator.

Johnson (2009) for example, criticises the absence of representative citizen narratives in An Inconvenient Truth. “The lack of personal narrative leads me to wonder with whom the audience is being asked to identify?” (Johnson 2009, p. 39). In many ways, the fact that individual stories aren’t celebrated detracts from the sense of individual agency that the film is attempting to foster. The individual calls to action are limited – as if an afterthought – to the impersonal text sitting within the credits. Arguably, the audience is being asked to connect with Gore’s own personal story, and one of the dominant themes of the film is his lament about his own inability to bring about change. In designing a narrative to inspire individual action, it would seem important to focus on, and celebrate the power of, at least one really successful personal story.
3.3.2 Logos

Johnson (2009) goes on to make a strong case for scientific rationalism as the major instrument with which apocalyptic narrative should be tempered. It is, she says, “the language of authority” (Johnson 2009, p. 32), and has the ability to persuade rationally. Science, in the form of facts, figures, graphs and charts, depersonalises the story and reveals the big picture, making the narrative seem less extreme, less revolutionary, and thus more acceptable to the mainstream public. The danger of scientific rhetoric is that, if a narrative argument rests solely on science, critics can use the contested nature of the ‘facts’ to undermine the whole constructed story. A logical argument can also be overplayed. Johnson (2009) points out that the majority of any one apocalyptic narrative is traditionally dedicated to convincing an audience about the severity of impending environmental collapse. In doing so, she argues, the narrative may in some way imply that the existence of the issue in question is up for debate. Thus, logos is much stronger when linked powerfully to a narrative’s ethos and pathos.

Norris et al. (2005) make a distinction between stories intrinsic to, and extrinsic to, science. Stories intrinsic to science describe some natural phenomenon, and are part of the body of scientific knowledge. Stories extrinsic to science are those about the science, and are external to the actual body of scientific knowledge. Spoel et al. (2009) hold that the inclusion of intrinsic narrative explanation ensures that cultural perspectives on climate change include the more technical side of climate science. If the facts and figures are viewed and explained through an appropriate narrative lens, they are likely to be more easily absorbed into dominant cultural narratives and understandings.

3.4 The particular power of film

Personal narratives, like all stories, are found in a multiplicity of different forms. Most stories exist informally in people’s everyday lives and experiences, like stories shared around a dinner table or between friends in a school courtyard. Some are formalised – from the more traditional oral and written storycraft, through to the more recent genre employing, among other things, moving images.
Ever since the first film was produced in the late 19th century, the power of moving images as a means of communication has been recognised (Reeves, 1999). In the very early days of cinema, people were so awestruck by the sheer existence of moving images that there was little need for filmmakers to use narrative structure. The novelty of movement in and of itself, however, soon wore off, and audiences expected the narrative structure they were accustomed to from early forms of popular entertainment (Winston 1996). The ongoing role of moving images in society was solidified during the war years, when film used widely as a vehicle for propaganda (Reeves 1999), and since then, television, cable television, VCRs, DVDs and the internet have fueled the continued growth of film and related media. Carroll (2003) notes that moving images are now a major form – if not the major form - of international communication. This has been reinforced by the advent of web-based video hosting sites like YouTube and Vimeo, which have allowed instant global sharing of personally crafted moving image stories.

Carroll (2003) argues that much of the popularity of moving image media lies in its ability to appeal to our innate human programming. Firstly, and most obviously, we as a species are highly attuned to movement and change. In the past, it would have been an evolutionary advantage to be drawn to movement and activity, so it is difficult for us to pay close attention to a static object for extended periods of time. Our minds tend to wander, always in search of new information. This, our biology of attention (Carroll 2003), gives moving images an advantage over other forms of media. With moving image, not only is the content of each image itself moving, but the images themselves are constantly refreshed with cuts and angle changes, repeatedly renewing audience attention in a way that a book or a static image simply can not. Secondly, moving images as we know them today, almost without exception, are shown with sound. Humans are drawn to sound as they are to movement, and the combination demands our attention. Carroll lists a further two means by which moving image holds audience attention, which relate particularly to the traditional ‘film’ screening. Films are generally watched in a darkened room or theatre, which reduces the number of distractions or other demands for our attention. And films on the big screen have impressive scale – the large images fill our minds and consciousness.

Finally, the basic building block of moving images – the single-shot image – is accessible to nearly everybody. Irrespective of educational, economic, cultural and social
background, almost every individual is able to engage with, and understand (at least at the level of depiction) images that rely on pictorial representation, because they engage our natural cognitive and perceptual capacities.

With the advent of digital technology, moving image is increasingly accessible to New Zealand school students. Many classrooms have projection facilities, and digital video production is incorporated into some courses. Digital cameras are now relatively cheap, most new computers come with basic video editing software, and YouTube, Vimeo and other web-based video hosting sites have made it easy for students to access and share video content. With the advent of social networking sites and platforms like Facebook and Ning, the users of which are still predominantly young people, sharing of web-hosted videos has become a widespread and popular social practice. For these reasons, film is arguably one of the most potent vehicles for the sharing of personal stories with and between young people.

In this chapter, I have argued that stories, and personal narrative in particular, are effective educational tools with both epistemological and transformative potential. Careful narrative design can further enhance their ability to inform and change an audience. Film is a particularly powerful and increasingly accessible medium for young people to engage with these personal narratives, and can thus be used in climate change education to promote action competency. In the next chapter, I will show that film and filmmaking unlock opportunities within the mainstream school curriculum to enable this demographic to engage with climate change issues in a way that promotes action competency.
Chapter 4

Films to change a climate

In the previous chapter, I examined why stories, and personal stories in particular, have huge potential as powerful means of promoting action competency on climate change issues. I discussed how careful design can enhance the already strong narrative effect of stories on the attitude action gap, and why film is a particularly powerful conduit for these stories amongst young people.

This chapter moves from theory to practice. I will use the case study of *Lessons from a Melting Icecap* to show how a film can be designed for a New Zealand secondary school audience to promote action competency on climate change issues. Drawing on the EfS theory outlined in Chapter 2 and on a survey of student filmmakers, I will then explain why filmmaking has the potential to close the attitude-action gap even more effectively than does the experience of simply watching film. As an action-focused, interactive learning process embedded in students’ lived reality, the process of filmmaking helps students build lived narratives of climate change and is thus intrinsically more powerful than the experience of simply watching a film. I will examine barriers to the integration of film and filmmaking into New Zealand schools, and finish by showing that both film and filmmaking can be used throughout today’s mainstream curriculum in a way that encourages climate change education (and promotes the development of EfS) across learning areas.

4.1 Film - Lessons from a Melting Icecap

As part of this thesis, a film about climate change was produced (refer Appendix 1), targeted at New Zealand secondary school students. *Lessons from a Melting Icecap* follows three New Zealand secondary school students on a journey from Dunedin to London, and on to Greenland. It documents their exploration of, and growing concern about, climate change and oil use, as they witness first hand the impacts it is having on
Greenland’s landscape and people. Upon their return to New Zealand, one of the girls in particular takes inspiring steps to share what she learned with other young people.

As an example of a personal narrative, Lessons is (as discussed in the first half of Chapter 3) automatically set up to address a number of the determinants of the attitude-action gap. Its format makes it an accessible way for an audience to increase their knowledge and awareness of, and emotional engagement with, the climate change issue; explore its complexity, ambiguity, dilemma and contradiction; study larger social and cultural contexts; experience others’ perspectives on the issue; develop their opinions; and feel validated as action competent beings.

By paying careful attention to each mode of rhetorical proof (ethos, logos and pathos - as discussed in the second half of Chapter 3), a filmmaker can maximise the impact of these intrinsic benefits to ensure that their film amplifies target audience action competency around climate change issues as much as possible.

4.1.1 Narrative design of Lessons from a Melting Icecap

a. Ethos

To maximise narrative effect, the narrators of Lessons are peers of the target audience (i.e. New Zealand high school students). Annika Metua, Susan Smirk and Peggy Russell are Year 13 students at a New Zealand all-girl secondary school, and each has attributes that make them accessible to a different section of a Kiwi youth audience. Peggy is a fashion-conscious young woman with an after-school retail job and aspirations to become an architect. Susan is articulate and driven – she’s concerned about the state of the world from a human rights perspective. Annika is different again. She’s the youngest, and she’s out to maximise the fun in life. Peggy and Susan are New Zealand European, while Annika has Polynesian heritage. All three are good friends. These are narrators that young New Zealanders can easily relate to, and through whose eyes new experiences and information is readily accessible. They are credibly representative of some of New Zealand’s youth, and the first two chapters of the film are dedicated almost solely to building up audience familiarity with the girls. Young people know excitement at winning competitions, being on television, first flights overseas, the joys of a day
spent shopping in a big foreign city. By the end of Chapter 2, the aim is for the youth audience to have identified with at least one of the girls, and recognise them as in some way “typical” or “culture conforming” (Bruner 2001, p. 41). The scene and the narrators should feel familiar enough that a safe space is created – that the audience is completely disarmed and feels comfortable as the girls continue on their journey.

This safe space is maintained by the girls throughout the film. The film is edited so as to leave in small sections and sound bites that lend themselves more to building the narrators’ identity as Kiwi schoolgirls than they do to advancing the main themes or messages of the film. The film’s main messages could have stood without, for example, the Iceland stopover (11:48 – 14:36). But it is a useful section for helping the target audience consolidate their connection with the narrators. The way the girls react to the Iceland experience – to new experiences, plane delay and eventual take off for Greenland - is typical of young New Zealanders. On top of that, Peggy’s inclusive language in the opening lines of the chapter helps build a collective sense of identity:

12:04 (Peggy) “Ohh (laughs) Iceland was a very interesting place to stay! Um, we learnt that they eat very weird things for breakfast...what we eat for lunch they eat for breakfast...”

To maintain that safe space, the film steers well clear of any questioning of New Zealand’s reliance on oil until the third to last chapter. Even then, the girls simply muse on the situation, using inclusive language. In this way, the film calls on the audience to question for themselves the implications of today’s social and cultural norms, rather than alienating the narrator from the audience through direct attacking statements. Such language also avoids as far as possible the pitfalls associated with use of story as an educational tool (as discussed in Chapter 3) – leaving the audience with questions, rather than dictating answers.

33:55 (Susan) “What would happen if suddenly oil just wasn’t an option any more? If oil’s going to keep getting scarcer and scarcer, and more and more expensive, then shouldn’t we start to think about the huge impact that that’s going to have on our lives?”
Importantly, however, the link to New Zealand and New Zealand’s situation is made – this decreases the perceived distance of the audience from the problem, closing the attitude-action gap (as discussed in Chapter 1). Because it is audience peers pointing out these connections – peers that audience members have come to recognise themselves in – the questions are more acceptable than they would be coming from a distant narrator.

The actions celebrated at the end of the film are again relatively culture conforming. Susan’s pilgrimage to Christchurch, and Peggy and Annika’s university courses are not hard-line activist work, nor could they be considered actions typical of ‘tree-huggers’. While there is no way of knowing whether the girls would have made these choices without their Greenland experience, by this stage in the film it is almost irrelevant. More important is that they do take action, and that the actions they take are arguably more inspirational than the individual actions advocated at the conclusion of films like *An Inconvenient Truth* (e.g. changing light bulbs). The film thus aims to encourage mainstream New Zealand youth to consider choosing a significantly more sustainable direction in life.

Positive feedback from teachers using the film has focused particularly on the choice of narrators.

“Sharing the story from a student’s perspective is very powerful and non-threatening.”

**Facilitator of a coeducational inter-secondary-school enviroygroup in Gisborne**

“Having the presenters the same age as your target audience really brings the message home and makes it relevant. The students loved that it was New Zealand students presenting the film. They could relate to that and to their ‘horror’ and surprise that such a pristine place as Greenland is so easily corrupted.”

**Teacher of Year 7 and 8 Social Studies at a decile 10 coeducational state primary school in Wellington**
Most teachers also said they found the narrative sections about the journey and the girls’ reflective narration useful, both for drawing students into the story and for promoting inquiry learning.

“Students enjoyed the travel aspects of the film.”
Teacher of Year 10 Social Studies at a decile 6 coeducational state secondary school in Northland

“[The students] enjoyed the travel sections and the narrators’ comments.”
Teacher of Year 5 – 7 at a decile 9 coeducational state primary school in Waikato

“The film was perfect for showing how such an inquiry could unfold as the girls in the film went through a similar journey ... it showed that the girls’ understanding of climate change developed over the course of their trip and that at different points they had to re-evaluate their thinking in the face of new information. [This was] exactly how we were encouraging our students to approach their own inquiry: ... that they would engage with an issue which interested them, that their understanding of the issue would change and develop over the course of their inquiry, that they would reflect on how their learning had developed over time and that they would be inspired to take meaningful actions to help bring about change.”
Teacher of Year 9 and 10 Social Studies at a decile 10 state-integrated girls’ secondary school in Waikato

A small minority – all of whom were teachers of Year 7 or 8 students – said their students found the girls’ narrative a little slow at times.

“My class are a pretty average bunch of 11 and 12 year olds, so a few of them said the film was boring. It was too slow for them I think - in terms of the girls actually getting to Greenland - and I think because of the age they are, they (the boys in particular) wanted the state of things to be worse! (By that I mean more 'holy!' / devastating / shocking.) Also because they’d seen Al Gore’s film already which is a bit like that... The deeper thinkers in class definitely got more out of it, in terms of watching three motivated girls going to action.”
Teacher of Year 7 Social Studies at a decile 5 coeducational state intermediate school in Waikato
As credible and representative as they are, crucially as narrators the girls are not particularly authoritative. It is for this reason that the film uses secondary narrators to add power to the girls’ words. Martin Lord Rees (08:09 – 10:05) delivers a powerful argument for the existence of climate change and the importance of climate action; ‘Georg’ is Greenland’s representative citizen, the victim of climate change (19:11 – 21:31); and the MP that they bump into in the hotel adds strength to their claims that Greenland’s climate is changing (21:51 – 23:18).

b. Pathos

Lessons could be classified as an apocalyptic narrative (as defined by Killingsworth and Palmer 1996), in that it does employ representations of future scenarios:

34:35 (Susie) “When I look at what we saw, it’s like we saw a glimpse into two really different worlds. We saw a world where there’s climate action groups, where people ride bikes, and where people like Martin Lord Rees are speaking out. And we also saw Greenland. A world which is suffering the effects of climate change, and where the situation’s basically looking pretty grim.”

It also offers possible solutions:

05:35 (Annika) “So they put in things like rooftop gardens, and rainwater collection systems, and insulation, and recycling centres…they have a lot of innovative ideas that we in New Zealand, still aren't quite getting to thinking about.”

And it empowers its audience to take action on climate change issues:

35:36 (Peggy) “We came to the realization that we’re in a time when we can still make a difference. It’s not the end, it’s not too late, we still have that opportunity. And we can choose to be ignorant, and to just turn a blind eye towards it, or we can choose to make a difference.”
One of the major premises that the film rests on is that if young people in New Zealand are emotionally connected to the impacts of climate change in Greenland, and they can see the links to New Zealanders’ current reliance on oil, they will take action on the issue. For this reason, the film does set about to engage its audience emotionally with the Greenland situation. The girls’ own emotional journey helps establish this connection – the binary concepts of joy and sadness, and hope and fear, are juxtaposed often, as recommended by Jensen (1995). The Ikateq sequence (23:21 – 26:39) begins, for example, with the girls delighted to be en route to the village. Soon, however, Peggy’s tone has changed immeasurably.

24:37 (Peggy) “It’s sort of hard to explain how we felt, walking into Ikateq. This was the place that people had grown up, people had lived their lives and they’d died here. And, to just walk into this space, it was kind of like a sacred ground that we were intruding on.”

Another way the film engages the audience emotionally is through Georg’s representative citizen narrative. His own victim narrative about the loss of hunting grounds (19:11) is built on with the girls’ experience at Ikateq, and extended again with their discoveries at Tasilaq and with the link to New Zealand lifestyles. By the end of the film the audience has mentally linked their own fate to that of Georg – somewhat unsettling, given his victim status. The fact that the girls’ point out the similarities between New Zealand’s situation and Greenland’s situation ensures the problems are tied firmly back to the New Zealand context. This requires the audience to question the implications of their current lifestyle, not only for those in Greenland, but for their future selves.

Music is used to reinforce appropriate audience response – a good example of this begins at 19:37 during the approach to the glacier, when the sequence’s music gives a sense of building calamity.

Overall, however, the apocalyptic tendencies of Lessons are much tempered, as advocated by Johnson (2009). Solutions to the issue of climate change (as experienced by the girls in England) precede the bad news of Greenland’s melting icecap, so that the audience is galvanised with alternatives rather than feeling overwhelmed when they
hear of the impacts climate change. Relatively speaking, the bad news is light on cataclysmic future scenarios, and proportionately short. It is punctuated with light-hearted sections and fun graphics. The travel sequence between the bleakness of abandoned Ikateq, and the grim realisations the girls come to in Tasilaq (26:40 – 28:40), for example, is a cheerful, bright interlude. The section documenting their initial experiences in Tasilaq (28:40 - 31:13) is punctuated with humorous sound bites and lively music.

29:45  (Peggy) “We hope to see you on TV when you get back, nice and safe!”
(John) “OK!”
(Peggy) “Don’t die!” (laughs)
(Susan) “Shhhh!” (laughs)

Although the end of the film is arguably the most apocalyptic of the whole narrative, even then it is tempered with hope. The conclusion of the film celebrates the paths chosen by the three girls – celebrates their increasing action competence – in a way that can only serve to validate action competent ways of being amongst the audience.

Many teachers reported that their students were more positive and/or interested in taking action as a result of watching the film.

“I found it effective because it stimulated curiosity and prompted deeper level thinking from my students. Students really wanted to know more, take action and make a difference.”
Teacher of Year 5 – 6 at a decile 7 coeducational state primary school in Auckland

“It really got the kids thinking, and some of our kids that aren’t really into Enviroschools got tuned in by it.”
Teacher at a decile 7 coeducational state primary school in Southland

“It was a great motivator.”
Teacher of Year 7 at a decile 10 composite private girls’ school in Auckland

Teachers were particularly enthusiastic about the solutions-focused parts of the film,
based on the girls’ experience in England.

“The good parts were seeing what Cambridge are doing, lots of bikes, the interview with the English Statesman type character, the self sufficient settlement etc...”

Teacher of Year 7 Social Studies at a decile 8 coeducational state intermediate school in Bay of Plenty

“All the kids were interested in the things the girls saw in the UK, like the eco-community.”

Teacher of Year 7 Social Studies at a decile 5 coeducational state intermediate school in Waikato

c. Logos

Scientific rationalism is also used to temper the apocalypticism of Lessons. Science-based evidence is another way of adding authority to the girls’ journey and narration (Johnson 2009). Instead of being delivered in the form of graphs and charts, however, the science is told - where possible - in the form of mini stories, and embedded in the narrative in a way that aims to keep the focus quite firmly on the girls’ journey. An example is the explanation of icebergs:

23:43  (Peggy) “And we were effectively following this sort of, trail of icebergs that had come down from right up the top of Greenland – it had come down the side.”

“The icebergs that break off from the glaciers, they travel down through the fjords, and down through the east current. And we were lucky enough to travel through this trail of icebergs, on our wee rusty fishing boat, with our captain Siggy...”

That science is used to back up the girls’ experience (as opposed to science being the basis of the film’s rhetoric), limits the chance that deconstruction of one piece of scientific evidence would derail the film’s entire argument.
Where it is necessary to visually leave the girls’ journey to explore a science-based concept, light-hearted graphics are used to keep the science youthful and in keeping with the film’s ‘feel’. In many places, the graphics are integrated with the footage itself (see, for example, 26:59, where the jumping fish plunges into ‘real’ water) to help maintain an uninterrupted narrative flow.

Attempts are made to embed stories intrinsic to science within a “framework of cultural rationality” (Spoel et al. 2009, p. 77) to make them more accessible to a New Zealand school age audience. A good example of this is the graphic that illustrates Greenland’s ice loss:

21:03 (Susie) “If you put together the loss of ice from all of Greenland’s glaciers, it would come to about a kilometer of solid ice on top of a city the size of Wellington...every year.”

The graphic gives students a feel for the extent of the ice loss by relating it to the size of a city (and, visually, a landmark) they’re familiar with. The graphic itself is light hearted – sound effects help establish this feel – and in keeping with the rest of the film.

Teachers responded to the positivity and ‘fun’ of the graphics.

“It is an easy and positive way of communicating the science behind climate change with the graphics etc.”

Facilitator of a coeducational inter-secondary-school envirogroup in Gisborne

4.1.2 Recommendations - film in the classroom

As described in Chapter 2, the key components of EfS effectively tackle the attitude action gap. If these components are used as a benchmark for effective learning in the classroom, it becomes obvious that, in and of itself, a classroom screening of Lessons (and any other film designed to empower young people to action on climate change) will not maximise student action competency.
A film like *Lessons* does incorporate many of the components of EfS (see Chapter 2, and Tilbury 1995 for a discussion of these). It increases relevance of climate change by making connections between students’ lives, large-scale social and environmental processes, and the lives of others in distant parts of the world. It promotes a more holistic view of the world, by showing connections between social, political, environmental and cultural processes. It aims to imbue students with pro-sustainability values, and invites them to consider others’ value systems. It encourages consideration of the climate change issue (and, simultaneously, multiple other social, ethical and environmental issues) at multiple spatial scales. It takes a socially critical approach, and invites students to do likewise. It calls on students to imagine different futures, and consider alternatives. It provides two of the dimensions of EfS – education *for*, and education *about* the environment. And it promotes an action focus, verifying student action competency with stories about three increasingly action competent young women.

What a film cannot do, however, is provide a ‘lived’ version of these experiences. No classroom screening can provide opportunities for education *in* the environment, the third dimension of EfS, and promotion of an action focus is not the same as supporting and assisting students to take action themselves. Ultimately, if we live storied lives (Bruner 1986), then the stories that will be most real to us, and make most sense to us, will be our own. It is through students’ lived experiences of climate change (and of other forms of science (Roth and Lee 2004)), building their own narratives in their own communities with their own landscapes, that they will really start to appreciate the relevance of the issue to themselves as individuals, and truly begin to build their action competency.

EfS theory (as discussed in Chapter 2) suggests that, to further promote action competency on climate change with a student audience, a film like *Lessons* should be embedded in a community-linked project focused on the issue. A research project might enable students to investigate what climate change might mean for their community, and what actions can be taken locally to mitigate and/or adapt to climate change. An action project could see students taking an action to mitigate and/or adapt to climate change in their local area, in collaboration with the community. A documentation project could provide students with an opportunity to learn and tell the story of a local
person or group taking action to mitigate and/or adapt to climate change. It is this last form of project that I concentrate on in the next section.

Each of these projects has the potential to address the determinants of the attitude-action gap (Chapter 1, Kollmuss and Agyeman 2002) by moving the students’ learning from the classroom into the community (Chapter 2, Roth and Lee 2004), and from experiencing others’ narratives, to experiencing their own (Bruner 1986, Chapter 3), further building on any transformative experience that a film provides (Chapter 3, Jackson 1995). Such projects enhance relevance through place-based education and participation in real-world problems, reducing the perceived distance of the issue from the student, and working to bring it within their perceived sphere of control. They place environmental issues in a local social context, reiterating interdependence and inviting a socially critical approach (particularly in terms of the role of norms in creating and solving the climate crisis). They encourage adoption of pro-sustainability behaviour in a community context, increasing the chance such behaviour will be habituated, and building the foundations for lifelong learning outside of school. They promote study and understanding of the links between the climate change issue at different scales, from local to global. And they are focused on assisting students to identify cause and effect, alternative futures, and change strategies. All of these things, built with the strong foundations of action, help address different aspects of the attitude-action gap, promoting action competency on climate change issues.

4.2 Filmmaking – Freemasons’ BIG Science Adventure DVD Competition and Outlook for Someday

Any documentation project that encourages students to research and tell an empowering local climate change story will promote action competence. The process of filmmaking is just one form that such a project could take, but it is grounded in moving image – a particularly powerful narrative (and therefore educational) tool.

The process of filmmaking is effectively the process of researching, crafting and capturing a personal story. Personally I have found that, as a filmmaker, the experience you have of the story you are constructing or reconstructing is much deeper than your audience’s experience will ever be. You are researching an angle, building or bonding
with characters, making editorial decisions about content, developing a perspective, creating a narrative shape. In doing so, you work closely with the full range of story’s inherent transformative potential (as described in Chapter 3). Filmmakers working on climate change films will experience climate change as a story, and will discover emotional aspects to the narrative as they attempt to engage their audiences emotionally. They will grapple with the ambiguity, complexity and contradiction in the story they are trying to tell, and become more confident in articulating the issues as they find words and pictures to tell the story they are seeking to tell. They will experience others’ perspectives, identify dominant and minority cultural narratives, and they will be challenged to develop their own opinion on the subject. If they are action competent on the climate change issue, there’s potential for the story that they are telling to validate such competency, particularly if the story they are telling is an empowering, local, personal story. Further, in designing a narrative and discovering how much their own feelings guide editorial decisions, as a filmmaker they will have first hand experience of the inherent bias and associated pitfalls of story as an educational tool. Thus the process of filmmaking is a powerful way to promote action competency on climate change issues.

In recent years, two New Zealand filmmaking competitions have encouraged production of climate change-focused short films produced by New Zealand secondary school students. In 2007 the Freemasons’ BIG Science Adventures DVD Competition, run by the Royal Society of New Zealand, invited Year 11 - 13 students to submit a film no longer than 5 minutes in length on a local climate or energy story. That same year, The Outlook for Someday film competition started. The brief was in the form of an invitation to any young New Zealander up to the age of 21 – “make a short film, up to 5 minutes, about how you see the future unfolding; to look at your world through a lens of sustainability; to give your personal take on what matters to you, focused on the future” (Connected Media 2008, para. 1). The competition was run again in 2008. Climate change was a central theme of many Outlook for Someday entries.

As part of my research, I carried out a survey of BIG Science ’07, and Outlook for Someday ’07 and ’08 entrants. I surveyed one member from each team (see Appendix 2 for a copy of the survey). Where I could obtain contact details for more than one team member, I randomly selected a team member to survey. I included only teams whose films
included climate change as a central theme, and conducted the survey only with participants who were enrolled in secondary school (Years 9 – 13) at the time they made their competition film. I conducted the surveys by telephone. I didn’t conduct any comparative analysis between BIG Science and Outlook for Someday participants, due to the small sample size.

The aim of the survey was four-fold.

1) To establish how much support students had from schools to produce the films.  
2) To establish the epistemological gain and the extent of transformative experience the process of making a film provided for students  
3) To establish the depth of student knowledge of climate change issues  
4) To ascertain to what extent students are action competent on climate change issues

4.2.1 Results and discussion

a. Survey participant profile

In total, 29 students were interviewed – 13 males and 16 females. 11 students had made their film while in Year 13, 5 while in Year 12, 9 while in Year 11, 3 while in Year 10 and one while attending Year 9. Twenty of the students entered the BIG Science competition; nine were Outlook for Someday participants.

Students were asked to score five statements about different factors that may have motivated them to make the film, on the basis of how important they were in the student’s decision (refer Appendix 2). The motivator statement that scored highly most consistently was ‘I wanted to make a film’. The motivator statement that most consistently scored low was ‘I had to do it for school’. Other motivator statements representing a wish to ‘do something to raise awareness about climate change’, a desire ‘to win the prize’, and ‘friends or classmates’ desire to make it, all scored inconsistently.
b. School support for filmmakers

*Class time and tuition and equipment*

Just three of the students (10.3%) had some dedicated class time to spend on their project. For all other entrants, the project was extra-curricular.

![Figure 1: Extent of filmmaking tuition prior to students making their films](image)

As shown in Figure 1, prior to making the film most students had had some tuition in how to structure a story (72% of those surveyed). Just under half of all surveyed participants had been instructed on editing (48%), shot framing and composition (45%), and camera and tripod use (41%). Fewer than a third had been provided with training in sound, interview techniques and narration (28% each), lighting and graphics (24% each) and direction of actors (14%).
Figure 2: Extent of climate change tuition prior to students making their films

As illustrated by Figure 2, over half of students reported their school’s climate change tuition prior to film production to be either ‘minimal’ or ‘non-existent’. 17.2% considered it ‘adequate’, and just under a quarter said it was either ‘considerable’, or ‘very extensive’.

All students used an edit suite or computer of sorts, and all but one student used a camera. Over 10% of students did not use a tripod, while over 50% of students did not use an external microphone.

Of the students that did use cameras, tripods and external microphones, most students used school equipment. Just 36% of students, however, accessed their edit suite or computer through the school. Over half used their own, and a further 11% borrowed or hired.

School support for the students’ film projects was, generally speaking, low. This is evidenced by the low level of class time dedicated to the filmmaking process, the high
proportion of students reporting a low level of climate change tuition, and the many aspects of filmmaking for which students reported a similarly low level of tuition.

While it could be argued that students are learning as they move through the filmmaking process, a basic level of tuition in climate change and filmmaking, backed up with some dedicated class time and teacher assistance, would aid student learning and ensure quality project and deeper learning outcomes. Tuition would ensure that available equipment was used to its best advantage, and dedicated class time may also enable students to use school editing facilities, rather than having to rely on their own (or borrowed) computers. Ideally, each school would provide a camera, tripod, external microphone and editing suite for student use.

Research

Figure 3: Amount of time students spent on research for the film relative to research for an average school project

Figure 3 shows that about half of all interviewees reported putting more effort into
researching the film than they would for their average school project. A small minority put in less effort, while the rest (37.9%) said it was on a par with their average research effort.

![Figure 4: Extent of use of different resource types during student film research](image)

As Figure 4 illustrates, the internet was by far the most widely used resource type during student film research, followed by conversations or interviews with people. Films, newspapers and books were the next most widely used resource types. Lesser-used sources included magazines, television, archives and radio.

On average, interviewees sourced information from between three and four different resource types. Just under half (48.3%) of participants spoke to more than four people during the process of making the film.

Despite the lack of class time dedicated to the filmmaking process, students reported putting a significant amount of effort into research. The types of media they sourced information from are not surprising given the rapidly changing nature of the climate
change issue, and the general lack of coverage of the issue in news media. Without support, however, there is the possibility of students obtaining incorrect or incomplete information from sources like the internet, or misinterpreting perspectives and opinion as objective information. With some basic knowledge of climate change the possibility of students experiencing such problems would be reduced. Class time dedicated to good research practice would reduce the risk even further.

The majority of participants (79.3%) reported that the process of making the film meant spending more time outside of the classroom, either in the environment or with the local community, than they would for other school projects. That the process drew students out of the classroom into more ‘real world’ contexts is promising given the importance of relevance to both effective storytelling (as discussed in Chapter 3) and in EfS theory (as discussed in Chapter 2).

c. Epistemological and transformative potential

Students were asked how much the filmmaking process had increased their understanding of a number of different climate change topics.

Figure 5 shows that through the filmmaking process, students reported having learnt the most about actions New Zealand’s communities could be taking to limit climate change, and to reduce the impact of climate change. The vast majority of students said the process had increased their understanding of the impacts climate change might have on their local community.

The process also seems to have assisted a high proportion of students to become more aware of the different perspectives about climate change and/or the different perspectives about how it should be tackled. A slightly smaller majority found the process increased their understanding of the causes and general impacts of climate change.
These student reports indicate that, in terms of epistemological function, the process of making a film worked particularly well in terms of helping students understand climate change in a more local context. The smaller proportion of students reporting increased understanding of the causes and general impacts of climate change could be due to a relatively high baseline knowledge of these basics before they started making the film, or the scope of the BIG Science competition (a local climate or energy story) limiting the scope of their research.

To investigate the transformative potential of filmmaking, students were also asked to what extent the process had helped them develop their own opinion on the climate change issue, and whether they started taking more individual actions to reduce their carbon footprint because of making the film.

**Figure 5: Epistemological outcomes of the filmmaking process**

The process of making the film helped students to:

- Understand actions that NZ communities can take to mitigate & adapt
- Become more aware of different perspectives about climate change & climate action
- Understand potential impacts on their local community
- Understand general causes & impacts of climate change

Percentage of survey participants (n = 29)
Figure 6: Transformative outcomes of the filmmaking process

As demonstrated by Figure 6, over three quarters of survey participants reported that the filmmaking process had helped develop their own opinion of both climate change and how it should be tackled. Almost two thirds of students reported that the process had led them to take more individual actions in their own life to reduce their carbon footprint, most of which were small changes. In addition, for just under a quarter of students (24.1%), the process of making the film changed their plans for the future. These results support the idea that the process of filmmaking has relatively high transformative potential.

Amongst the students who reported changing their behaviour as a result of making the film, there existed little convergence of motivating factors for the change. The statement that consistently scored most highly was ‘I want to stop climate change because it’s damaging the environment’. The lack of convergence amongst the motivating factors suggests the process allowed students to delve into different focus areas and develop their own opinions and perspectives on the climate change issue.

d. Content knowledge

Participants were asked four multiple-choice questions. The first, ‘Under the Kyoto Protocol, New Zealand has agreed to reduce its emissions by how much by 2012?’ was answered correctly by 24.1% of participants. The second, ‘What percentage of New
Zealand’s carbon emissions come from agriculture?’ was answered correctly by 20.7% of participants. The third, ‘Approximately how big is each New Zealander’s carbon footprint (measured in annual metric tonnes of carbon dioxide equivalent?)’ was answered correctly by 13.8% of participants. The final question, ‘What aspect of the average New Zealander’s life contributes the most to their individual carbon footprint?’ was answered correctly by 31% of participants.

Just under 60% of participants correctly answered at least one question, with just 24.1% of participants correctly answering two or more.

The low number of students able to guess correctly the answers to both big picture and more individually-focused questions about climate change is unsurprising given the low level of climate change tuition students reported as having received from schools. It reinforces the need for students’ filmmaking to be grounded in basic knowledge about climate change, promoted either by tuition during class time, or by directed research work.

e. Action competency

Participants were asked to name which actions they were currently taking, at least in part because they were trying to reduce their carbon footprint.

As illustrated by Figure 7, all but one student reported recycling their household waste, and almost all do so frequently. Over 90% reported choosing public or low carbon transport over the car, and over 80% said they compost their green waste, advocate for green options amongst friends and family, and buy locally produced food and goods. Just under 80% said they avoid buying food and goods made outside of New Zealand. For all but recycling, a significant number of students reported only undertaking the activities infrequently.
Participants were also asked to name the actions they will consider taking within the next 10 years, at least in part to reduce their carbon footprint.

Figure 8 shows that just under two thirds of participants said they will consider growing their own vegetables (and over a quarter say they already do). Almost 80% said they will consider living close to work so they don’t have to travel (6.9% already do). 34.5% said they will consider limiting the amount of meat and dairy they consume (13.8% already do), and just 24.1% said they will consider avoiding air travel (with 3.4% - one person - already doing so).

Survey participants reported quite a high level of pro-sustainability behaviour, both in their current lives, and in their intended future. It is notable, however, that the lowest rate of positive response was for two of the most high emissions activities surveyed – that of reducing meat and dairy consumption, and that of reducing air travel. Whether this was because of lack of awareness about the relative carbon-intensity of various
activities, or because of a lack of willingness to reduce consumption in these areas, is unclear.

Figure 8: Survey participants’ long term behaviour intentions

4.2.2 Recommendations – filmmaking in the classroom

The survey results suggest that filmmaking is a useful process for students to engage with climate change, in a way that promotes action competency. However, learning could be deepened and better quality project outcomes produced if school support for filmmaking projects was reinforced. Provision of appropriate filmmaking equipment, dedicated class time, tuition in both the basics of filmmaking and the basics of climate change, and support to ensure information collected during research is interpreted correctly, would all be useful forms of school support.

The role of the process in promoting action competency could be similarly strengthened, to ensure it tackles the determinants of the attitude-action gap described in Chapter 1.
Some key research directives, drawing on the key components of EfS (Chapter 2) would aid this. Students could be asked to focus their research on one inspiring local story about a person or group in their community, and to research a number of different perspectives before they choose their angle and/or main character. As well as providing a focus for their project, this would increase the chance that the filmmaking process validated existing action competency, the chance that the student engages emotionally with the subject, and the chance that the project feels relevant. If the student is then asked to clearly show the links between the local story and both national and global climate change issues, they may themselves start to understand the relative importance of various pro-sustainability behaviours, and distinguish between behaviours with low carbon and high carbon pay offs, as well as appreciating the contribution that behaviour makes to solving the problem at a larger scale. Finally, students should be asked to think carefully, in the context of the overall impact they would like their film to have, about who is best to narrate their story, how their film will engage an audience emotionally, and how their story can be backed up with logic and science. This will familiarise students with the extent to which narrative is constructed (Chapter 3), as well as encouraging them to explore each facet of their story and numerous creative possibilities.

4.3 Barriers to, and opportunities for, film and filmmaking in the curriculum

Using narrative as a medium for climate change education in New Zealand’s secondary schools (and film and filmmaking in particular) has the ability to tackle many of the constraints that have typically frustrated implementation of EfS in the classroom. These constraints can be further addressed with supporting materials encouraging a pedagogy that simultaneously supports action competency and assists teachers with curriculum links.

At a first glance, it could be thought that the implementation of many of the recommendations in this chapter would be hampered by the same barriers that EfS has faced (Chapter 2): an overcrowded curriculum limiting class time, budget constraints preventing adequate provision of equipment, and limited teacher knowledge of both climate change and filmmaking (perpetuated by restricted professional development opportunities) holding back tuition. Indeed, this is true for many teachers attempting to
work within traditional subject boundaries, but because film and filmmaking both fit traditionally with the arts and humanities, a great opportunity exists for these to help EfS transcend the traditional subject silos of the mainstream curriculum, particularly at the conventionally highly partitioned senior secondary level.

Barriers to the implementation of EfS, outlined in detail in Chapter 2, fall mostly into three main categories – theoretical, structural, and those related to knowledge or resource.

4.3.1 Theoretical constraints

Use of film and filmmaking as a vehicle for EfS effectively removes any theoretical constraints. For those practitioners concerned about “educating ... to advance particular ends” (Jickling and Spork 1998, para. 36), film is a useful way to promote the critical examination of information that students should to engage in. Films like Lessons are rich sources of topics for critical examination. Indeed, narrative theory (Chapter 3) suggests that action competency could be promoted by critical examination of such films, particularly if it results in discussion about the role of social and cultural norms and contexts in determining individual thought and action patterns. Further, such critical examination could also be used to ensure students examine closely the motivations of the narrators and filmmaker, counteracting any of the potentially negative impacts of using story as an educational medium (Chapter 3), as well as providing an opportunity for students to help develop their own opinion on the issues around climate change.

For those practitioners concerned that the overwhelming nature of the problem may disempower students, it is easy to ensure that the films screened, and stories captured by the filmmaking process are both positive and inspiring. Lessons tells the story of three young women who take on the challenges of climate change and oil dependence and make fairly big life choices on the basis of that knowledge. This sort of story, in and of itself, promotes individual action competence by providing a New Zealand youth audience with inspiring examples of peers taking action (the importance of which is discussed in Chapter 3). As discussed earlier in the chapter, the response from students to the film, as reported by teachers, has been uniformly positive. When such a story is teamed with research, documentation or action projects that empower students to
envision and work towards positive future scenarios, the possibility that students feel overwhelmed by the problem is further reduced. Filmmaking is an example of a process that has the potential to help students engage with and celebrate a positive climate change story in their local community.

4.3.2 Structural constraints

a. Curriculum-related constraints

Although there is much work to be done before EfS is integrated throughout the New Zealand secondary school curriculum, and secondary schools can be considered to be taking a whole school approach to sustainability, the new New Zealand Curriculum (New Zealand, Ministry of Education 2007b) does provide an opportunity for movement in this direction. Films like Lessons, backed up by pedagogy that engages students in research, action or documentation projects (e.g. filmmaking) around climate change issues are in line with the Curriculum’s Vision of young people “connected” to the land and their communities, and “actively involved” in creating “a sustainable social, cultural, economic and environmental future for our country” (New Zealand, Ministry of Education 2007b, p. 8).

Such projects are also good vehicles for many of the Curriculum’s Principles, in particular those of “Community Engagement”, “Coherence”, “High Expectations”, and “Future Focus” (New Zealand, Ministry of Education 2007b, p. 9). They also assist students to develop and explore the Values outlined by the Curriculum, particularly:

- “Excellence” (aiming for a safe climate future in the face of challenges posed by climate change, which constitutes “aiming high and persevering in the face of difficulties”, as excellence is described by the Curriculum)
- “Innovation, Inquiry and Curiosity” (thinking critically about our current lifestyles and their impact on the planet, exploring creative alternatives, reflecting on what those alternatives may look like in their own community)
- “Equity”, “Integrity” and “Respect” for self, others and human rights (understanding the disproportionately large impact of climate change on poor people and those in undeveloped countries, and acting ethically to mitigate these impacts)
- “Community and Participation” (researching, designing and taking action to reduce the impact of climate change, in collaboration with communities)
- “Ecological Sustainability” (promoting ecological sustainability through increased awareness of, and action for, a safe climate future) (New Zealand, Ministry of Education 2007b, p. 10)

In working on such projects, students will also be making use of the Curriculum’s Key Competencies:
- “Thinking” (linking greenhouse gas emissions and climate change to local and national consequences through research; critically analysing information gathered; using this knowledge to shape appropriate action)
- “Relating to Others” and “Participating and Contributing” (working with others to design a project / decide on shared values and priorities / take action as part of a community with responsibility not only at the local level but as New Zealanders and as global citizens)
- “Using Language, Symbols and Text” (to communicate a complex scientific issue to a broad audience; constructing locally relevant messages in appropriate formats)
- “Managing Self” (working as part of a group to set a goal, make plans and manage a project; building students’ feelings of empowerment - their ‘can-do’ attitudes and self-motivation) (New Zealand, Ministry of Education 2007b, p. 12 – 13).

In moving towards a more integrated, whole school approach, films like Lessons and processes like filmmaking, help support the inclusion of EfS and climate change education in subjects that are resistant to EfS-focused reform because of a strong traditional culture or structure (Schreiner et al. 2005). Teachers of subjects such as English and Media Studies are provided with a climate-focused resource that they can use for conventional assessment and project work. In this way, such film resources have the potential to quietly encourage development of cross-curricula climate change-related projects, and to assist teachers to no long perceive such topics as an add-on (Cowie et al. 2004), but as something that can be integrated into core curriculum content. At senior secondary levels, resources like Lessons could also be used to raise teacher awareness of EfS Assessment Standards, and of the extent to which there is support for EfS and sustainability-related content in the new New Zealand Curriculum.
If supporting resources outlining curriculum links, project suggestions and assessment opportunities (like EfS Assessment Standards) are provided alongside films like Lessons, integration of resources is made much easier for teachers. Refer Appendix 3 and 4 for the resources provided alongside Lessons on use of the film in the classroom, and student filmmaking respectively.

b. Time-related constraints

For use in New Zealand secondary schools, film length is another design consideration. Most feature films, including An Inconvenient Truth, are well over one hour long, making their inclusion in an overcrowded curriculum prohibitive:

“I know I could use parts of films like An Inconvenient Truth ... The films are usually very long and I fear they may lose impact if only parts are used. I feel I don’t have enough time to show the whole thing, and that does put me off, finding the right spot to show.”

Teacher of Technology, Home Economics and Food Technology at a decile 6 state integrated girls' secondary school in Auckland

Restricting the duration of Lessons to less than 40 minutes enables it to be shown in its entirety in one timetabled period. Further, if climate change is being studied in subjects across the board, the basics will be well understood by students, freeing up time for teachers to delve into the specifics most relevant to their subject area:

“Film is taught in English, so it’s not taught in Science.”

Teacher of Science, Horticulture and Biology at a decile 8 co-educational state secondary school in the Manawatu

“One main difficulty of using film as a tool is the need to teach filmmaking and the subject material in the time you have, i.e. you should teach storyboarding, film techniques, editing, script writing, acting, research, camera use (and misuse), etc.”

Teacher of Environmental Science at a decile 5 coeducational state secondary school in Northland
Cross-curricula projects can allow meaningful, real-world interaction that would otherwise be impossible to cover under the time-restrictions of one subject. This might see the study of a climate change film in English resulting in an action based project researched as part of Social Science, backed up with learning in Science, designed in Technology, promoted through Art and Information Technology, and the whole story documented for English.

4.3.3 Knowledge and resource constraints

a. Lack of knowledge

There is no doubt that teachers are in need of professional development in both the area of climate change (Cowie et al. 2004) and that of filmmaking, and that this lack of knowledge in the area is a barrier:

“We have a Year 10 Environmental Sustainability course at school but I personally don’t teach it. The people do not use film making for this ... they don’t have expertise in filmmaking.”

*Teacher of Social Studies, Journalism and Media Studies at a decile 6 state girls’ secondary school in Waikato*

“The most successful filmmaking has occurred when the student has already learnt the skills elsewhere and so is confident to use them. I have not made the time to incorporate a proper unit where they can learn the skills, since I don’t have them myself (and have never been offered training).”

*Teacher of Technology, Home Economics and Food Technology at a decile 6 state integrated girls’ secondary school, Auckland*

Although provision of a resource like *Lessons* cannot provide much-needed pre-service training and ongoing professional development for teachers, support materials can provide guidance for teachers on some climate change basics, and advocate projects with a more student-driven, action-oriented pedagogy. The *Lessons* supporting resource, for example, outlines the difference between climate change adaptation and climate change mitigation, suggests some projects which could be developed as a follow
on from the resource, provides a link to a film website with examples of other schools using the resource (www.meltingicecap.co.nz), and recommends links to additional climate change resources. A filmmaking guide does similarly, and is designed to assist those teachers who need guidance through the basics:

“I am very interested in attempting to teach using filmmaking but need to have a model to start from.”

Teacher of Science and Horticulture at a decile 7 co-educational state secondary school in Auckland

b. Lack of additional resources

Lessons begins filling a gap in the current suite of climate change resources available to New Zealand secondary school teachers. Few New Zealand-specific climate change resources exist, and where they do, few meet teachers’ requests that they be cross-curricular and easily adaptable to local contexts (Chapter 2) – Lessons is an example of a New Zealand resource that does both of these things well. To help teachers adapt the resource for their own needs, the film’s associated resource provides links to additional resources, and a virtual online resource sharing space where teachers are invited to share their experiences of the film with other teachers.

Lessons fills teachers’ other requests too – it is pupil friendly, easily integrated with other curriculum areas, and available through Te Kete Ipurangi.

Because it is young people telling their own story, rather than a textbook or resource supplied by government, industry or an NGO, Lessons welcomes discussion, dissection and critique. Compared to many other classroom resources (Chapter 2), such films claim very little authority, and pose many questions. These films and their associated resources should (like Lessons) encourage critical analysis and recommend ongoing community-linked inquiry – important skills in the context of rapidly changing science and an issue that has the potential to impact hugely on every aspect of society, and skills that help to close the attitude-action gap.
As a learning process, student filmmaking has the potential to make the most of resources that exist in abundance – people in the community. Such processes also promote community links and critical analysis of information sources, advocated by both EfS theory and the new *New Zealand Curriculum* (New Zealand, Ministry of Education 2007b).

4.3.4 Additional constraints

Sponsorship from external education-focused organisations means *Lessons* is supplied free to schools, removing any of the financial barriers that face many schools:

“The school is reluctant to buy these [climate change-focused] films.”

*Teacher of Science, Horticulture and Biology at a decile 8 co-educational state secondary school in the Manawatu*

And while filmmaking equipment is relatively expensive, because such resources are not necessarily subject-specific, the financial burden can be shared more evenly. For the purposes of this thesis I have focused on film and filmmaking as examples of a narrative resource and narrative process, because moving image is a particularly powerful educational tool, appealing as it does to our innate human programming (Carroll 2003). In the absence of film or filmmaking expertise and equipment, however, any narrative resource or process will be useful in promoting action competency on climate change issues amongst young people (refer Chapter 3 for a discussion of the intrinsic power of narrative). The narrative could take the shape of an art installation, an essay, a music or dance composition, or a series of photographs – whatever is manageable and affordable. It is the student’s engagement with an inspiring local climate change story that is important, and the more in depth the student’s engagement, the more relevant the story, the more powerful the student’s transformative journey will be.

Huge potential exists for positive stories, and particularly positive personal narratives, to act as conduits of action competency on climate change. Film as a resource, and filmmaking as a process, are especially powerful ways for young people to engage with these climate change narratives. If films are designed, like *Lessons*, with particular
attention to pathos, ethos and logos and their role in promoting action competency, their effect on attitude-action gaps (which is already considerable) can be enhanced even further. EfS theory suggests that use of such films should be in the context of a place-based, community-linked project with an action-based component, to ensure students build and live their own relevant narratives of climate change. EfS theory also suggests that the process of filmmaking, further heightens students’ experience of such narratives. As shown by responses from a survey of student filmmakers, there is significant epistemological and transformative potential in the process, given appropriate support, resourcing and direction.

As shown by interviews with teachers, and the numbers entering competitions like *Outlook for Someday* and *BIG Science Adventures*, it seems neither film nor filmmaking have yet been fully embraced as educational tools in New Zealand schools. In part this is due to the barriers which have restricted the development of EfS. However, with carefully designed resources providing teachers with direction and support, the new *New Zealand Curriculum* promoting integrated learning across disciplines, and the provision of EfS standards, potential exists for film and filmmaking to help integrate climate change education (and EfS theory) across today’s mainstream curriculum.
Conclusion

The need for individuals to understand and start to take action on climate change has never been greater as scientists warn of the potentially disastrous effects of further delays to the implementation of mitigation practices. In New Zealand, however, as in most places around the world, there are proportionately few people taking such action, even amongst the younger generations that will be most affected by the impacts of climate change. There is an urgent need for New Zealand’s schooling system to education for action competency on climate change issues – to support and empower young people to take action.

With this thesis I aimed to investigate how film and filmmaking can be used in New Zealand schools to encourage action competence on climate change issues amongst students. To do this, I produced a film designed to promote action competency on climate change in New Zealand schools. I also conducted a review of the relevant literature from the areas of psychology, education for sustainability, narrative and film, had discussions with teachers and carried out a survey of young filmmakers.

As discussed in Chapter 1, the need for action on climate change is urgent, and it needs to be driven from the level of the individual. Currently in New Zealand, as elsewhere, this is not happening. Particularly concerning is the level of inaction amongst young people – those who will be most impacted by the issue. The factors that influence the development and presence of the attitude-action are multiple and complex, and there is no quick fix, but the knowledge that exists can be used to target school education processes to promote action competency on climate change issues.

In Chapter 2 I explained that, although little is known about the way climate change is being taught in New Zealand schools, the better-studied umbrella movement of Education for Sustainability (EfS) has key characteristics that directly address the attitude-action gap. The implementation of EfS (and climate change education, as far as can be ascertained) has run into many barriers. However, there is increasing teacher demand for both resources and support in the area of climate change. This would
suggest that there exists an opportunity to develop climate change resources and pedagogy that, while keeping EfS theory at their core, attempt to transcend some of the problems EfS has traditionally faced.

The great potential for employing narrative-based resources, in particular film, to extend climate change education (and thus EfS) beyond the traditional science and social science subjects, and to promote cross-curricula projects, is discussed in Chapter 3. Stories, particularly personal narratives, are effective educational tools with both epistemological and transformative potential. This narrative effect can be used to target the attitude-action gap, and can be enhanced by careful narrative design. Film is a particularly powerful and increasingly accessible medium for young people to engage with these personal narratives, and can thus be used in climate change education to promote action competency.

In Chapter 4 I showed that film and filmmaking offer powerful opportunities for young New Zealanders to engage with climate change issues in a way that promotes action competency. If, like Lessons from a Melting Icecap, films are designed with particular attention to the impact pathos, ethos and logos on audience action competency, the already-strong narrative effect’s impact on reducing the attitude-action will be further enhanced. EfS theory suggests that such films should be screened in conjunction with a place-based, community-linked action project. This will further promote action competency, helping students develop their own relevant narratives of climate change.

Filmmaking is an example of a learning process that could heighten students’ experience of such narratives. As shown by responses from a survey of student filmmakers, there is significant transformative potential in the process. To be truly effective, however, students must be appropriately resourced and supported, and filmmaking projects should be community-linked and focused on inspiring local stories.

Neither film nor filmmaking have yet been fully embraced as educational tools in New Zealand schools. In some ways, their use is hindered by the barriers EfS is also experiencing. However, with provision of carefully designed resources, and the new New Zealand Curriculum and EfS Assessment Standards promoting integrated learning across disciplines, potential exists for film and filmmaking to help integrate education on
climate change (and other big picture issues, as well as EfS theory) across today’s mainstream curriculum.
Reference List


Appendix 1

Lessons from a Melting Icecap
Appendix 2

Survey for student filmmakers
1. Team Number / Competition

2. Year Level (when film made)

3. Was the film completed as part of a school project?
   a. Yes
   b. No

4. What was the name of your school?

5. If it was done for a school project, what subject was it for?

6. What was the reason for you making the film? Rate the following statements in terms of their importance.
   1 – This played no role in making me want to make film
   5 – This played a really important role in making me want to make the film
   a. I had to do it for school
   b. My friends or classmates wanted to make it
   c. I wanted to win the prize
   d. I wanted to make a film
   e. I wanted to do something to raise awareness about climate change
   f. Other

7. Did your school teach you about any of the following aspects of filmmaking before you started making the film?
   a. Framing and composition
   b. Camera handling and use of a tripod
   c. How to structure a story
   d. Writing narration
   e. Interview techniques
   f. Lighting
   g. Sound
   h. How to direct actors
   i. How to create graphics
   j. Editing

8. Did your school teach you about climate change before you started making the film?
   1 - Not at all
   2 – Minimally
   3 – Adequately
   4 – Considerably
   5 – Very extensively

9. Under what subjects and in which year levels did you learn about climate change?

10. Which of the following equipment did you use to make your film, and to whom did it belong?
    Options for to whom it belongs –
    i) School
    ii) Yourself or another student involved in making the film
    iii) Your family
iv) Borrowed or hired

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<thead>
<tr>
<th>Equipment</th>
<th>Used?</th>
<th>To whom it belongs?</th>
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<tbody>
<tr>
<td>a. Camera</td>
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<td>b. Tripod</td>
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<td>c. External microphone</td>
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<tr>
<td>d. Edit suite/comp with software</td>
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11. How much effort did you put into researching the film?

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<td>a. Approximately the same as I do for other school projects</td>
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<td>b. More than I do for other school projects</td>
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<td>c. Less than I do for other school projects</td>
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<tr>
<td>d. I can’t remember</td>
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12. What kinds of sources did you use for your research?

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<tbody>
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<td>a. Books</td>
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<td>b. Internet</td>
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<td>c. Films</td>
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<tr>
<td>d. Interviews / talking to people</td>
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<td>e. Magazines</td>
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<td>f. Radio</td>
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<tr>
<td>g. Television</td>
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<tr>
<td>h. Archives (old video recordings/photos/museum collections)</td>
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13. How many people did you interview for the film, or talk to as part of your research?

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<td>b. 5-9</td>
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<td>c. 10-14</td>
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<td>d. 15-20</td>
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<tr>
<td>e. 20+</td>
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14. How much time did you spend ‘outside the classroom’ (in the environment, or in the community) while you were making your film?

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<td>a. Approximately the same as I do for other school projects</td>
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<td>b. More than I do for other school projects</td>
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<td>c. Less than I do for other school projects</td>
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<tr>
<td>d. I can’t remember</td>
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15. Did the filmmaking process make you more aware of all the different perspectives about climate change and or the different perspectives about how we should be tackling it?

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<tr>
<td>a. A lot more aware</td>
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<td>b. A little more aware</td>
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<td>c. It didn’t raise my awareness</td>
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<td>d. I don’t know</td>
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16. Did the process of making the film help you develop your own opinion about climate change, and about how we should be tackling it?

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<td>a. It helped a lot</td>
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<td>b. It helped a little</td>
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<td></td>
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<td>c. It didn’t help at all</td>
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<td>d. I don’t know</td>
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17. Did the process of making the film increase your understanding of the causes and general impacts of climate change?

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<tbody>
<tr>
<td>a. It increased my understanding a lot</td>
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<tr>
<td>b. It increased my understanding a little</td>
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<td></td>
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<tr>
<td>c. It didn’t increase my understanding at all</td>
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</table>
18. Did the process of making the film increase your understanding of the impacts climate change might have on your local community?

a. It increased my understanding a lot
b. It increased my understanding a little
c. It didn’t increase my understanding at all
d. I don’t know

19. Did the process of making the film increase your understanding of the actions New Zealand’s communities could be making to limit climate change, and to reduce the impact of climate change?

a. It increased my understanding a lot
b. It increased my understanding a little
c. It didn’t increase my understanding at all
d. I don’t know

20. Did the process of making the film lead you to change your life to take more actions to reduce your carbon footprint?

a. Yes, I made some big changes to my life
b. Yes, I made some small changes to my life
c. No, I didn't change my life at all
d. I don’t know

21. Why did the process of making the film lead you to take more individual actions? Rate the following statements in terms of their importance in influencing you to take more actions

1 – This didn’t influence me to take more action at all
5 – This was really important in making me take more action

a. I realised for the first time how big the problem is
b. It made me more aware of the actions I can take in my own life
c. I met people that were doing things to help, and was inspired by them
d. I saw how much climate change could impact negatively on my future and I wanted to prevent that.
e. I saw how much climate change could impact negatively on my community’s future and I wanted to prevent that.
f. I learnt how climate change is hurting people on the other side of the world
g. I want to stop climate change because it’s damaging the environment
h. I wanted to lead by example

22. Do you take any of the following actions, in part because you are trying to reduce your carbon footprint?

Options –

i. Frequently
ii. Infrequently
iii. No

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<thead>
<tr>
<th>Action</th>
<th>Action frequency</th>
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<tbody>
<tr>
<td>a. Recycle household waste</td>
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<td>b. Compost green waste</td>
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<tr>
<td>c. Choose to take public transport, or low-carbon transport (eg bikes) instead of the car</td>
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<tr>
<td>d. Advocate for sustainable options amongst your friends and family</td>
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<tr>
<td>e. Buy locally produced food and goods</td>
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<tr>
<td>f. Avoid buying food and goods manufactured outside of New Zealand</td>
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</tbody>
</table>
23. Did the process of making the film change your plans for the future (eg. What you want to be, where you’ll live, what you’ll study)?
   a. Yes, it changed my plans dramatically
   b. Yes, it changed my plans a little
   b. No, it didn’t change any of my plans
   c. I don’t know

24. Within the next 10 years, will you consider taking any of the following actions at least in part because you are trying to reduce your carbon footprint?
   Options –
   i. Yes
   ii. No
   iii. I already do that
   iv. I don’t know
   a. Avoid air travel
   b. Limiting the amount of meat and dairy you consume
   c. Living close to your work so you don’t have to travel
   d. Growing your own vegetables

25. Under the Kyoto Protocol, New Zealand has agreed to reduce its emissions by how much by 2012?
   a. 6% below 1990 levels
   b. 10% below 1990 levels
   c. To 1990 levels
   d. 6% above 1990 levels
   e. Don’t know

26. What percentage of New Zealand’s carbon emissions come from agriculture?
   a. 21%
   b. 34%
   c. 48%
   d. 57%
   e. Don’t know

27. Approximately how big is each New Zealander’s carbon footprint (measured in annual metric tonnes of carbon dioxide equivalent?)
   a. 3 Mt CO2e
   b. 9 Mt CO2e
   c. 10 Mt CO2e
   d. 16 Mt CO2e
   e. Don’t know

28. What aspect of the average New Zealander’s life contributes the most to their individual carbon footprint?
   a. Transport
   b. Electricity
   c. Solid waste
   d. Food production
   e. Don’t know
Appendix 3

A guide for use of the film in classrooms
Lessons from a Melting Icecap is a film designed as an introduction to the issues of climate change and oil dependence. It is intended to help students engage with the issues in a way that not only promotes understanding of the seriousness of the situation, but also empowers students to take real action in their own town. For this reason, it’s recommended that the film is used to kick-start a community-linked project around the issue of climate change & oil dependence. Possibilities include:

- **A research project**, with students looking at what climate change might mean for their community, & what actions can be taken locally to mitigate & / or adapt to climate change;
- **An action project**, with students taking an action to mitigate & / or adapt to climate change in their local area, in collaboration with the community;
- **A documentation project**, with students researching & telling the story of a local person or group taking action to mitigate & / or adapt to climate change.

Mitigation and Adaptation

To avoid catastrophic climate change, the world’s population needs to reduce greenhouse gas emissions rapidly. This is called mitigating climate change – reducing emissions to prevent climate change from happening, e.g. by increasing energy efficiency, & / or promoting low carbon (and less) transport, and community gardens etc. Unfortunately, because of lags in the climate system, even if all emissions were stopped tomorrow, the world will still experience significant climate change, which humans will need to adapt to, e.g. by installing infrastructure to prepare for droughts, storms & sea level rise.

Links to the New Zealand Curriculum

Projects that engage students in research, action or documentation projects around climate change issues are in line with the Curriculum’s VISION of young people connected to the land & their communities, & actively involved in creating a sustainable social, cultural, economic & environmental future for our country.

These projects are good vehicles for many of the Curriculum’s PRINCIPLES, in particular those of Community Engagement, Coherence, High Expectations, and Future Focus.

Such projects assist students to develop and explore VALUES, particularly:
- **Excellence** (aiming for a safe climate future in the face of challenges posed by climate change);
- **Innovation, Inquiry & Curiosity** (thinking critically about our current lifestyles & their impact on the planet, exploring creative alternatives, reflecting on what those alternatives may look like in their own community);
- **Equity, Integrity & Respect for Self, Others, & Human Rights** (understanding the disproportionately large impact of climate change on poor people & those in undeveloped countries, and acting ethically to mitigate these impacts);
- **Community & Participation** (researching, designing & taking action to reduce the impact of climate change, in collaboration with communities);
- **Ecological Sustainability** (promoting ecological sustainability through increased awareness of, & action for, a safe climate future).

They will also be making use of the KEY COMPETENCIES:
- **Thinking** (linking greenhouse gas emissions & climate change to local and national consequences through research; critically analysing information gathered; using this knowledge to shape appropriate action);
- **Relating to Others & Participating & Contributing** (working with others to design a project / decide on shared values and priorities / take action as part of a community with responsibility not only at the local level but as New Zealanders & as global citizens);
Using Language, Symbols and Text (to communicate a complex scientific issue to a broad audience; constructing locally relevant messages in appropriate formats);
Managing Self (working as part of a group to set a goal, make plans & manage a project; building students’ feelings of empowerment - their ‘can-do’ attitudes & self-motivation).

Specific Assessment Links and Resources

The film’s website www.meltingicecap.co.nz is a living hub for teacher resources around the film, & will be an ever-expanding database of examples of the film being used in schools across New Zealand, from Years 5 - 13, in many different subjects.

If you found the film useful in your classroom, or have climate change projects you’d like to share, please send details (Year Level, Subject, Assessment Standard links, additional resources, how it sat within a larger project, plus contact details, if you’d like the resource to be attributed to you) to me at lessonsfilm@gmail.com. Your contribution, added to the website, will help strengthen the film’s usefulness for other teachers.

Year 5 - Year 10

The issue of climate change is a great opportunity for cross-curricular projects, especially at Senior Primary & Junior Secondary level. A climate change-focused action project like a community garden can be researched in Social Science & Science, designed in Maths & Technology, documented & promoted in English, Art & Information Technology.

Year 11 - Year 13

Although there are many uses for the film throughout the senior curriculum, the Education for Sustainability NCEA Standards provide a particularly good framework for assessment of climate change-focused projects.

Visit www.meltingicecap.co.nz for examples of integration of the film and the climate change topic into other assessments. An electronic copy of this Guide is also available on the website.

Links with Education for Sustainability NCEA Standards

A research project could be assessed using
- EfS Level 2 AS90811: Describe the consequences of human activity within a biophysical environment in relation to a sustainable future
- EfS Level 2 AS90815: Work cooperatively to develop and present a strategy or design for sustainability in response to a future scenario
- EfS Level 3 AS90829: Investigate the relationship between humans and a biophysical environment in relation to a sustainable future
- EfS Level 3 AS90832: Develop & justify a strategy for an organization that will contribute to a sustainable future.

An action project could be assessed using
- EfS Level 2 AS90810: Plan, implement & evaluate a personal action that will contribute towards a sustainable future
- EfS Level 3 AS90828: Evaluate a planned personal action that contributes toward a sustainable future

A documentation project could be assessed using
- EfS Level 2 AS90813: Describe values & associated behaviours in relation to a sustainable future

Additional Climate Change Resources

TKI has a page dedicated to climate change resources: http://efs.tki.org.nz/Resource-Links/Climate-change

The global, youth-driven 350 movement (the local arm 350 Aotearoa: www.350.org.nz) provides a fun, positive way for young people to engage with the climate change issue, & has a good science fact sheet: http://www.350.org/files/materials/350_science_factsheet_FINAL2.pdf

Lacking on the TKI climate change resource page are links to whole community solutions (which are much more exciting for students than changing light bulbs!). A good place to start investigating whole community solutions in New Zealand is Transition Towns Aotearoa: http://www.transitiontowns.org.nz/
A guide for student filmmaking
Context for Use

This resource is designed to assist teachers who are wanting to guide their students through a filmmaking process. It is focused on the production of films about climate change, because filmmaking is a very effective way for young people to engage with empowering stories about this issue.

This filmmaking process advocated by this guide aims to facilitate student engagement with the issue in a way that promotes understanding of the issue & empowers students to take real action in their own town. The basic elements of this are:

- **relevance.** Students should be supported to consider the causes, effects & solutions to climate change within their own community, & encouraged to document one positive local story.
- **a socially critical approach.** Students should be supported to consider multiple perspectives, to understand the values and reasoning behind such perspectives, & to develop & articulate their own opinions on the issue.
- **an action focus.** Students should be encouraged to find a story about an action taken to mitigate or adapt to climate change.

Filmmaking Process

There are three components to the filmmaking process - **INQUIRY**, **NARRATIVE DESIGN**, & **PRODUCTION**.

Students should firstly be guided through an inquiry process, which supports them to investigate:

- the general global causes & effects of climate change,
- the causes and likely impacts of climate change at a more local level (in New Zealand & in their own community), &
- community-level solutions to climate change, in particular those in their own neighbourhood or town.

Because of the rapidly evolving nature of the subject, students should be encouraged to source information from the internet, from news reports, & from members of their community. They should be supported to make connections with individuals & community groups that are active on the climate issue, & to investigate a range of perspectives. They should be supported to critically analyse this information, & to develop & articulate their own opinions on the issue.

Next, students should be assisted to **design their film narrative.** They should be asked to select one positive local climate change story from their research - the more positive, the more empowering the process will be for students. In designing their film, they should be asked to consider:

- **audience.** Who will be watching this film? What implications does that have for narrative design?
- **narrative structure.** What is the beginning, middle & end of the story? What order of events is the most powerful?
- **narrator.** Are there multiple narrators & perspectives? Who is the most powerful person/character to tell this story?
- **facts.** What facts or science will help back up the story? What is the most powerful way to convey this?
- **emotion.** What sort of emotions should the audience be experiencing at different times during the film? How does the film convey these emotions?

Ideally, students should write a **shooting script** for their film, with a **storyboard** explaining shot-by-shot how they will tell the story.

Finally, the student should be assisted to **produce the film.** Filmmakers will need access to a video camera, a tripod, & a computer with an editing programme. An external microphone (that plugs into the camera) will enhance sound quality.

Film quality will be much improved if, before filming begins, students understand:

- basic camera operation and use of a tripod
- shot composition, and the fundamentals of lighting
- how to record good quality sound
- basic editing techniques
- interviewing skills, and narration.
Additional Filmmaking Resources

The 4-H Filmmaking Studio & Workshop is a great online filmmaking toolbox for designed with young people in mind, with video tutorials & much more. It's at http://online.4-hcurriculum.org/curriculum/filmmaking/

Untamed Science is another great site describing the basics of filmmaking: http://www.untamedscience.com/film


Links to the New Zealand Curriculum

The Lessons from a Melting Icecap Guide for Use of the Film in Classrooms has a broad overview of curriculum links for climate change-focused projects It’s at http://www.meltingicecap.co.nz

Specific Links with NCEA Standards

Climate change-focused student filmmaking provides a perfect opportunity for a cross-curricular project, particularly at Senior Primary & Junior Secondary levels when there are fewer assessment requirements. A climate change-focused filmmaking project can be researched in Social Science & Science, designed in Art & English, & documented in English & Information Technology. At Senior Secondary levels, although all three components could be delivered & assessed as part of NCEA Level 1 English, cross-curricula projects work towards the coherence (“links […] across learning areas”) advocated by the New Zealand Curriculum.

There exist many standards that could be used to assess student research of climate change issues. English offers AS90060 at Level 1 (researching, organising & presenting information). Other examples include Geography AS90206, AS90335 & AS90705 (at Levels 1, 2 & 3 respectively), all related to carrying out and presenting geographic research. At Level 2, Education for Sustainability offers AS90811 (describing the consequences of human activity within a biophysical environment in relation to a sustainable future), & at Level 3, AS90829 (investigating the relationship between humans & a biophysical environment in relation to a sustainable future). For students investigating a biological story, Biology offers AS90769 at Level 2, which asks students to research the interaction between humans & an aspect of biology, & AS90714, which asks students to research a contemporary biological issue.

To assess students’ narrative design there are a number of standards available through English. At Level 1, storyboards can be assessed with AS90059 (production of a media or dramatic presentation). Scripts assessed at Level 1 using AS90052, at Level 2 using AS90375, & AS90720 at Level 3 (all requiring the production of an example of creative writing). Media Studies offers AS90604 at Level 3 (completion & justification of a concept and treatment for a media product).

Level 1 English’s AS90059 (production of a media or dramatic presentation) could also be used to assess the production of a film. At Level 2, Media Studies offers AS90765 (design & production of a media product & evaluation of the process used to create the product), & AS90282 (use of technology in media production). At Level 3, Media Studies offers AS90606 (creation of a media product using appropriate media technology).

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