Teaching Controversial Environmental Issues in 16-19 A level Geography: Possibilities and Problems

by

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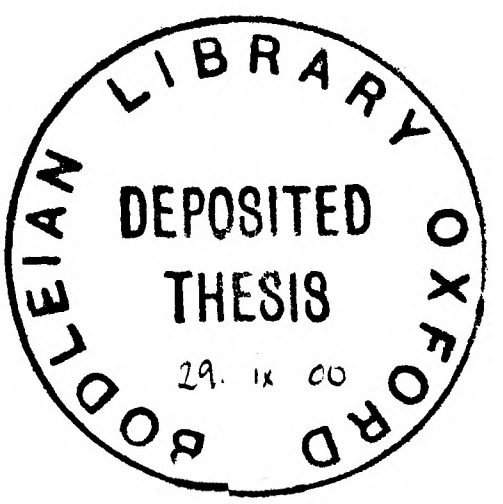

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Environmental issues are often controversial and involve a range of possible viewpoints or attitudes. They are poorly understood in the general population and, even amongst well respected scientists, there is often little consensus as to the causes and effects of environmental problems. Teachers are sometimes accused of exacerbating this situation by indoctrinating children with simplistic 'green slogans', rather than teaching a deeper understanding of the complexity of the issues. However, the advice provided for teachers is contradictory: much of the literature on teaching environmental issues encourages teachers to promote pro-environmental attitudes or behaviour, whilst simultaneously encouraging independence of thought amongst their students. Literature on teaching environmental and other controversial issues suggests several possible teaching strategies, but all are open to criticism on varying grounds and therefore provide little in the way of guidance for teachers.

This study examines the beliefs and practices of three experienced geography teachers in relation to teaching about controversial environmental issues in the Schools' Council 16-19 A level course. This course was one of the first to embrace the teaching of controversial environmental issues, and provides explicit guidance for teachers on the development of students' environmental attitudes. Using unstructured observation, and informant-style interviews with the teachers and their sixth form students, the research investigates the similarities and differences between the teachers' beliefs and practices, and considers the educational problems and possibilities with teaching controversial environmental issues.

The findings reveal a substantial divergence between the teachers' beliefs and the espoused aims of both the environmental education literature and the 16-19 syllabus. These teachers reject the aim of promoting pro-environmental attitudes in favour of a form of balanced learning. This involves the twin aims of providing access to a diversity of viewpoints, whilst maintaining a stance of non-intervention, by which they hope to encourage students to make independent decisions about appropriate environmental behaviour. A variety of imaginative teaching strategies are utilised in the pursuit of these aims. However, the findings of this study also illustrate the difficulties encountered by these teachers in trying to implement their beliefs, problems which can be explained by the influence of various constraints, such as the syllabus and examinations, the students' behaviour and characteristics, the subject matter being taught, and the teachers' own knowledge, pedagogical skills, and attitudes.

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Chapter 1
Introduction to the Study and Research Questions

1.1 Introduction to the study

The starting point for this study was an interest in environmental education and its role in dealing with the environmental problems currently confronting the world, for which it is increasingly being viewed as a panacea. For example, the United Nations Conference on Environment and Development in 1992 powerfully endorsed the role of education in moving society towards a more sustainable future through Agenda 21, recommending that all governments integrate:

> *"... environment and development as a cross-cutting issue into education at all levels within three years"* (UNCED, 1992) .

In addition, a series of international reports on the environment have emphasised the importance of environmental education (UNESCO-UNEP, 1978; IUCN UNEP and WWF, 1980; WCED, 1987; UNCED, 1992), leading Chris Gayford to propose that it has now been accepted by governments that environmental education is essential for the future survival of humanity and should be treated as a central concern for all areas of education (Gayford, 1996).

In British schools, this concern became translated into policy through the introduction of environmental education as a cross curricular theme in the National Curriculum. However, although intended as a subject which would cut across subject boundaries, recent research has shown that most schools continued to deliver environmental education through existing national curriculum subjects, primarily geography and science and, to a lesser extent, PSE (see table 1.1):

> *"As aspects of environmental education are included in both the statutory science and geography National Curriculum dating from 1991, it is not surprising that a very large majority ... was being delivered partly or wholly through these two subject areas."* (Tomlins and Froud, 1994)

Table 1.1

Strategy	Percentage of schools	Number of schools
Geography NC	92	215
Science NC	91	212
PSE	72	169
Technology NC	48	112
Cross- curricular	22	52
Other	31	71

(Adapted from Tomlins and Froud, 1994).

Geography has traditionally taken a central role in the delivery of environmental education in British schools, and the links between geography and environmental education are reflected in the Schools' Council 16-19 A level syllabus, in which environmental issues play a central role. The founders of geography 16-19 acknowledge the environmental movement as a major pressure for change from about 1970 onwards: as the social and environmental consequences of living in an increasingly technological world developed into issues of concern, the environment moved higher up the political agenda. Hence, the project team perceived the need for:

> *"... a broader, more open style of education, in which people learn to develop skills of enquiry and critical analysis and to be aware of and responsive to threats to the quality of life and environments."* (Naish et al., 1987, p. 7)

These goals became incorporated into the 16-19 course, and the current syllabus is based around issues of human-environment inter-relationship, and includes explicit consideration of environmental attitudes and values at both a political and individual level. Indeed, one of its stated aims is to:

> *"... enable candidates to acquire ... an attitude of concern for the quality of environments, for the condition of human life and for the biosphere as a life support system."* (ULEAC, 1996)

However, teaching about environmental issues is the subject of considerable controversy for a number of different reasons. Firstly, environmental issues themselves are frequently controversial and involve conflicting interests and attitudes.

Environmental issues are poorly understood in the general population and, even amongst well respected scientists, there is often little consensus as to the causes and effects of environmental problems (or even of the existence of some problems) (Stevenson, 1987). Although it can be argued that controversial issues may be purely factual - such as in the case of some scientific controversies (Deardon, 1981) - many environmental issues are controversial at least partially because of differing attitudes and values. This type of controversial issue has been defined by Wellington (1986), amongst others:

> *"A controversial issue must:*
>
> - *involve value judgements so that the issue cannot be settled by facts, evidence or experiment alone;*
> - *be considered important by an appreciable number of people."*
>
> (Wellington, 1986)

Both of these descriptions can be sensibly applied to many environmental issues. Although environmental issues may entail problems of a scientific nature, they often also present complex ethical and value issues. These ethical and value issues cannot be resolved by further research because they depend largely on the relative value ascribed to predicted environmental changes compared to economic factors. In addition, recent conferences such as the Earth Summit in 1992, and the Kyoto Climate Change Convention in 1997 suggest that environmental issues are considered important by large numbers of people world-wide.

The controversial nature of environmental issues provides a problem for teachers, who have the daunting task of presenting extremely complex and emotive issues to their students in a coherent and unbiased manner. Unsurprisingly perhaps, teachers are often accused of failing at this task, and of indoctrinating children with simplistic 'green slogans', rather than teaching a deeper understanding of the complexity of the issues (Storm, 1990/1991; Jickling, 1992; Aldrich-Moodie and Kwong, 1997; Ward, 1997). These problems are exacerbated by the confused and contradictory advice for teachers expressed in the environmental education literature. Much of the literature on teaching environmental issues encourages teachers to promote pro-environmental attitudes or behaviour in their students. Many now state that a major aim of environmental education is the production of a new generation of concerned individuals who have the skills and motivation to take action on environmental problems:

> *"... the long term task of environmental education [is] to foster or reinforce attitudes and behaviour compatible with a new ethic."* (IUCN UNEP and WWF, 1980).

> *"The changes in human attitude that we call for depend on a vast campaign of education, debate and public participation"* (WCED, 1987) .

However, these statements assume an agreement about the nature of desirable attitudes and behaviour which is simply not warranted. They also raise a number of other questions such as whether the aims of education include encouraging changes in students' attitudes, and how this could be achieved without the risk of indoctrination.

Adding to the problems confronting teachers is the advice which often accompanies these statements, that teachers should encourage independence of thought amongst their students. This can be clearly seen in the UK curriculum guidance document on environmental education:

> *"[Teachers should be] ... promoting positive attitudes towards the environment by encouraging: appreciation of and concern for the environment; independence of thought; respect for others' beliefs..."* (NCC, 1990).

The juxtaposition of 'encouraging independence of thought' with 'promoting positive attitudes' is problematic, and the two aims appear mutually incompatible. Some critics argue strongly that the role of education should be to encourage independent thought not to promote a specific world-view (Jickling, 1992), and others insist that the role of education is to impart knowledge rather than of act as an agent of change (Aldrich-Moodie and Kwong, 1997). Moreover, Elliott argues that attempting to influence students' attitudes and behaviour is of little educational value, and is likely to prove limiting and counter-productive (Elliott, 1993).

The literature on teaching about controversial issues provides some guidance for teachers, mainly focusing on three key aspects of teaching strategy: neutrality, balance and commitment. The Humanities Curriculum Project, one of the first areas to give controversial issues serious consideration, advocated procedural neutrality in order that teachers did not use their position of authority to promote their own opinions (Schools Council / Nuffield Humanities Project, 1970). An alternative option entails presenting a 'balanced' picture, which "recognises all points of view" (NCC, 1990). However, some people strongly criticise both these approaches and

argue that teachers should at least indicate which point of view they believe the evidence to support (Warnock, 1975). Others suggest that teachers will lose credibility with their students if they do not say what they think, and also that some issues (such as racism or sexism) are so important that impartiality is inappropriate (Stradling et al., 1984). It is clear that there is little consensus on methods for teaching controversial issues, and therefore no obvious guide for teaching environmental topics.

In conclusion, environmental education is apparently increasing in importance at the policy level, and is central to the geography 16-19 syllabus. Yet it raises problems for teachers, owing to the controversial nature of environmental issues and the contradictory rhetoric of the environmental education literature. Environmental education is seen as the key to solving environmental problems, and teachers are held responsible for producing a new generation of environmentally-concerned individuals. However, many questions concerning the role of attitude change in education, the risk of indoctrination, and appropriate teaching strategies for controversial environmental issues remain unanswered. Moreover, within the context of widespread normative judgements, beliefs and prescriptions in the literature, it is of vital importance to examine current practices in order to maintain contact with the realities of teachers' work.

1.2 Aims of the Research

Given the dilemmas and contradictions uncovered in the literature, the teaching of controversial environmental issues in schools is unlikely to be straightforward. The aim of this research, therefore, is to investigate any educational problems and possibilities which might arise from the teaching of such issues. The study was guided by a view of educational research as aiming to solve practical problems (Carr and Kemmis, 1986). Rather than taking a traditional view of theory, Carr and Kemmis view educational theories as consisting of those beliefs and assumptions which guide practitioners' actions. Thus, an educational problem arises when there is a "gap between a practitioner's theory and practice" (p. 112). In the context of this research, the aim is to understand the theories and beliefs which guide these teachers' teaching about controversial environmental topics and to investigate the ways and extent to which these beliefs are enacted in the classroom, thereby identifying any areas where the teachers' theories and practices diverge. It involves a critical appraisal of the adequacy of the theories and beliefs upon which current practices are based and, by illuminating such issues, aims to enable teachers to reduce the gap

between theory and practice by understanding and reconceptualising their actions in the light of new insights.

1.3 Mode of Inquiry

If educational theory is to be understood in terms of practitioners' understandings of their practices, as described above, it is clear that research must be rooted in teachers' own beliefs and theories about their teaching:

> *"... educational activities cannot be observed without reference to the shared educational values and beliefs of those engaged in educational pursuits."* (Carr and Kemmis, 1986, p. 111)

This view is shared by educational researchers such as Cooper and McIntyre (1996) and certain researchers in environmental education (e.g. Cantrell, 1993; Robottom and Hart, 1993). However, much previous research in environmental education has been undertaken within the positivist tradition and has involved preconceived assumptions about teachers' aims. For example, a plethora of studies describe students' environmental attitudes and their relationship to knowledge about environmental issues, and test whether educational interventions are effective at changing those attitudes, despite the absence of any evidence that teachers consider these to be educational problems (see Iozzi, 1989 for a thorough review of this area). A need was therefore identified for research which takes into account teachers' aims and beliefs regarding the teaching of controversial environmental issues.

However, whilst accepting the importance of participants' understandings, the research aims to move beyond a description of the teachers' beliefs to include an analysis of their actual teaching about controversial environmental issues in order to identify possible educational problems and possibilities. Given the contradictions in the literature concerning environmental education and controversial issues, it should not be assumed that teachers' beliefs will be simply enacted in practice. Carr and Kemmis suggest that in many teaching situations, there is likely to be some difference between how a practitioner expects things to be and how they actually are, due to the complexities of the classroom:

> *".. to concede that educational problems arise out of the ideas and beliefs of educational practitioners is not to accept that those ideas and beliefs must be true."* (Carr and Kemmis, 1986, p. 111)

One reason for this difference is that concrete realities of the classroom, beyond the teachers' control, impinge upon the teaching situation - realities which have been ignored in much of the environmental education and controversial issues literature. The relative paucity of empirical research which develops a qualitative understanding of the possibilities and problems related to teaching controversial environmental issues also lends an imperative to this study.

Taking into account the time needed to acquire an in-depth understanding of another person's perspective and the exploratory nature of this study, a case study design was chosen as the most appropriate research strategy. In this research, a multi-site case study approach was utilised to provide an understanding of the teaching of controversial environmental issues. The three cases studied, each encompassing the A level classes of an experienced geography teacher (referred to, for linguistic nicety, in the thesis as case studies 1, 2 and 3) were intended to provide illustrations of the problems and possibilities of teaching controversial environmental issues, rather than being studied because of their intrinsic interest as specific cases. This type of inquiry is described by Stake as 'instrumental case study', since each teacher is instrumental to learning about a particular issue of concern (Stake, 1995). The choice of a case study approach enabled teaching to be observed, without intervention, in its natural setting, the classroom. This meant that the important issue of maintaining connection with classroom reality was addressed.

The primary aim of the study was to gain access to teachers' beliefs and practices in relation to teaching controversial environmental issues therefore qualitative, interpretive methods were chosen, including unstructured observation of lessons and informant-style interviews with teachers and students (Powney and Watts, 1987). These methods have the advantage of providing rich descriptions of thinking and practice, and ensure that the teachers' own beliefs can be used to structure the analysis of lesson data, thereby enabling their aims for the lesson to be used as a basis for interpretation of their classroom practices. By utilising this interpretive strategy, based upon teachers' beliefs and intentions, the aim was to avoid prescription about what *should* be occurring in the classroom. However, whilst recognising a debt to the interpretive mode of research, this study does not restrict itself to uncovering practitioner's theories and beliefs but rather, critically examines these beliefs in the light of classroom practices and students' perspectives. The aim is to understand how and why teachers' beliefs about teaching controversial environmental issues become problematic when translated into classroom practice. By analysing these beliefs and practices, and referring to issues arising from the literature, the intention is to

illustrate some more general problems and possibilities of teaching controversial environmental issues.

1.4 Research Focus

In terms of the research, the overview of the literature (section 1.1) raises 3 different issues of concern as follows:

- What is the nature of environmental attitudes?
- Is changing environmental attitudes an appropriate aim of education?
- What kind of pedagogy might be utilised to teach controversial environmental issues?

These questions encompass 3 key areas: Conceptual (what is the nature of environmental attitudes?), philosophical or moral (ought educators to be attempting to change students' attitudes?), and practical (in what ways might teachers handle such issues in school?), all of which are important questions which underpin this research study. These themes will be explored in the review of existing literature in chapter 2.

1.5 Structure of the Thesis

The first chapter introduces the study, and provides a brief summary of the preliminary reading and a rationale for the research. It explains the aims of the study and the mode of inquiry and outlines the general focus of the research. Chapter two involves a review and critique of the extant literature relating to the themes identified above, and considers some potential problems with the literature on environmental education. Chapter three describes the methodology of the study, discussing both the choice of a case study approach and the principles and procedures which guided the data collection. Chapter four similarly describes the principles and procedures used in analysis of the data. Examples are provided throughout to illustrate the procedures in use.

Chapter five describes the teachers' beliefs and aims when teaching about controversial environmental issues, using evidence from interviews with each teacher to illustrate the major claims. Chapter six examines the teachers' classroom practices in the light of these beliefs, citing evidence from lesson transcripts. This chapter also integrates the students' perspectives, together with insights from the literature, to draw conclusions about the advantages and disadvantages of each teaching strategy

utilised. Chapter 7 moves to a more theoretical level to draw out some general conclusions relating to the possibilities and problems with teaching controversial environmental issues in contemporary schooling. It also considers the implications of the study in terms of curriculum development and teacher education, the possibilities for further research, and the limitations of the study.

Chapter 2
Literature Review

2.1 Introduction

Chapter 1 entailed an overview of the extant literature which is of relevance to this study. This chapter will provide a detailed review and critique of this literature, outlining some fundamental problems inherent in much writing about environmental education and about controversial issues, and thereby foreshadowing possible issues which might arise for the teachers in this study. The chapter is divided into 3 sections, each shedding light on a different aspect of the problems and possibilities of teaching controversial environmental issues:

Section 2.2 considers the **evolution of environmental education**, outlines its increasing importance both nationally and internationally, and discusses the growing emphasis on developing students' environmental attitudes;

Section 2.3 discusses the problematic **nature of environmental attitudes and values,** and describes the possible range of attitudes and values which environmental education might wish to promote;

Section 2.4 reviews the literature pertaining to teaching controversial issues and to teaching environmental issues, in search of an appropriate **pedagogy for teaching controversial environmental issues.**

Throughout the chapter, a wide ranging literature from the fields of education, psychology, controversial issues teaching and environmental education will be considered. Section 2.5 brings the argument to a conclusion and reports the research questions which guided the empirical part of the study.

2.2 The evolution of environmental education

2.2.1 The history of environmental education

Environmental education is in many respects a recent phenomenon. From the first reported use of the term in 1948, attributed to Thomas Pritchard (Palmer, 1998), environmental education, in its many forms, has come to be widely considered as an integral part of the curriculum, and an essential first step towards encouraging sustainable development. Since the first use of the term, many definitions of

environmental education have emerged and key international bodies have discussed its relevance and merits. The IUCN/UNESCO 'International Working Meeting on Environmental Education in the School Curriculum' in 1970 provided an influential definition:

> *"Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man (sic), his culture, and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality."* (IUCN, 1970)

Throughout the 1970s, the profile of environmental education increased, culminating in the UNESCO First Inter-governmental Conference on Environmental Education in 1977. This conference, in Tbilisi, Georgia, established recommendations for environmental education which continue to be of relevance to the current day. These recommendations included 3 goals of environmental education, which clearly influenced later discussions about the appropriate role and aims of environmental education:

> i) To foster clear awareness of, and concern about, economic, social, political and ecological inter-dependence in urban and rural areas.
>
> ii) To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment.
>
> iii) To create new patterns of behaviour of individuals, groups, and society as a whole, towards the environment. (UNESCO, 1977)

The 1980s brought the World Conservation Strategy - a combined initiative by the IUCN, UNEP and WWF. This document contained a chapter on environmental education, which strongly endorsed the role of environmental education in developing students' environmental attitudes and behaviours:

> *"... the long term task of environmental education [is] to foster or reinforce attitudes and behaviour compatible with a new ethic."* (IUCN UNEP and WWF, 1980)

Similarly, the report, 'Our Common Future', published in 1987 (often known as the Brundtland Report) suggested:

> *"The changes in human attitude that we call for depend on a vast campaign of education, debate and public participation"* (WCED, 1987)

In the UK, environmental education was also rising up the agenda, and supporters such as the Council for Environmental Education aimed to ensure its inclusion in the newly-designated National Curriculum. The HMI publication, 'Environmental Education from 5-16', also appeared in 1989, suggesting a growing awareness of the subject's importance (HMI, 1989).

In the 1990s, the publication, 'Caring for the Earth: A Strategy for Sustainable Living' (IUCN et al., 1991), contributed to the environmental education debate and laid out suggestions for implementation of environmental education policies. This document again emphasised the need for a new environmental ethic and a change in attitudes and behaviours, but also suggested activities to achieve specific environmental aims. Formal and informal education were both seen as playing key roles in bringing about these developments. 1992 saw the UN Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil, 'The Earth Summit', as it was popularly known. This large conference was attended by 120 heads of state and government, together with delegates from more than 170 countries, and the parallel Global Forum was attended by several hundred non-government organisations and special interest groups (Palmer, 1998). The centrepiece of the summit was Agenda 21, an action plan which set out ways of achieving sustainable development and, again, education played a key part:

> *"A proposal is made that:*
> *Governments should strive to update or prepare strategies aimed at integrating environment and development as a cross-cutting issue into education at all levels within three years."* (UNCED, 1992)

At around the same time, environmental education was designated as a cross-curricular theme in the National Curriculum of England and Wales, thus making it an official part of the mainstream curriculum for the first time. A critical component of the cross-curricular themes was the aim of promoting the discussion of attitudes and values, and this emphasis can be seen in the curriculum guidance for environmental education (NCC, 1990) (see section 2.2.2 below).

Research suggests that the growing enthusiasm for environmental education was shared by many teachers and students. An NFER report, published in 1994, found that the majority of school managers (80% of those surveyed) considered environmental education as either a 'quite' or 'very' important part of the school curriculum, and a small number (16%) saw it as 'essential' (Tomlins and Froud, 1994). A second NFER report states that the vast majority of students surveyed felt that it was at least 'quite important' that they should understand environmental issues (92%), and that young people should do something to protect the environment (88%) (Morris and Schagen, 1995). However, this research also revealed that schools had very low levels of environmental policy, and co-ordination of environmental education. Only 7% of schools surveyed had a single comprehensive policy document on environmental education, and 42% had no written policy on environmental education at all (Tomlins and Froud, 1994). This suggests that the actual status of environmental education in schools may not have been as high as the international and national concern might indicate. Another report by the CEE in 1996 produced similar findings: Only 2% of schools had a policy for environmental education, only 10 had an environmental education co-ordinator, and, even where a policy did exist, there was rarely a management plan to achieve it (CEE, 1996).

In addition, the cross curricular themes were gradually marginalised to the point of obscurity in most institutions, as they became invisible in the new slimmed-down National Curriculum. Some of the environmental education content was transferred into the science and geography curricula, but much was left dependent on the enthusiasm of individual schools and teachers (Palmer, 1998). This position was reinforced by the SCAA document, Teaching Environmental Matters Through the National Curriculum, which emphasised:

> *"It is for schools to decide how to teach environmental matters through the National Curriculum and how far to go beyond statutory obligations ... In some National Curriculum subjects, notably geography and science, the programmes of study ensure that environmental matters are taught ... Environmental matters may also feature in other National Curriculum Subjects, not because they are required but because schools choose to take up opportunities to include an environmental dimension."* (SCAA, 1996, p. 4)

It can be seen, therefore, that despite the strong support for environmental education in the national and international arena, its implementation in schools in England and Wales is likely to have been piecemeal due to pressure from statutory aspects of the National Curriculum.

2.2.2 The role and aims of environmental education

Most of the initiatives described above express support for the introduction of world-wide environmental education. However, considerable differences arise when the precise form this education should take is considered, and debate continues on the most successful way to approach environmental education in practice. A key issue is the relative importance of three aspects of environmental education: knowledge, attitudes and behaviour, illustrated by the 3 aims for environmental education devised by the Tbilisi conference in 1977 (see section 2.2.1). The relationship between these three aspects is reflected in the traditional division of environmental education into education *about* the environment; education *from* or *in* the environment and education *for* the environment (Huckle, 1990; Fien, 1992; Palmer and Neal, 1994; Tilbury, 1995). These three strands each emphasise different aims and teaching methods, which are briefly outlined below:

1. Education about the environment - students develop knowledge and understanding about the content and processes of the environment (CEE, 1995). Objectives are largely cognitive, the main aim being to amass information. Education about the environment has been criticised for its failure to examine the social causes of environmental issues or look at sustainable alternatives. Pupils are not encouraged to understand the cultural, political and economic systems which inter-relate with environmental issues, and therefore lack the depth of understanding needed to enable them to take action with regard to environmental problems (Huckle, 1990). Education about the environment is seen as objective and value-free. The discussion of personal viewpoints is not encouraged.

2. Education from (or in) the environment - students are taught by using the environment as a learning resource, either as a medium for discovery or as a source of teaching material. A wide variety of activities are encompassed, including outdoor education, field trips and use of the school grounds to teach about the environment. Objectives are equally varied, involving cognitive and affective aims such as learning important concepts, improving fieldwork skills, or nurturing a sense of involvement in the environment. It has also been criticised however, and has been described by John Huckle as "naive experimental encounters with nature" (Huckle, 1981).

3. Education for the environment (or for sustainable development) - students are explicitly encouraged to develop and express their own attitudes towards environmental issues, and make informed decisions concerning the links between human activity and the environment. Objectives go beyond the acquisition of knowledge and skills: pupils are encouraged to develop an informed concern for the environment and to take action

to improve or preserve some aspect of the local environment. Education for the environment aims to assist students in developing the skills which allow them to participate fully in a democratic society (Fien, 1992; Sterling, 1993; Tilbury, 1995)

Thus, there is a clear gradation from the largely knowledge-based 'education about the environment', through the knowledge and attitude development of 'education from/ in the environment', to 'education for the environment' which involves knowledge, attitudes and behavioural outcomes. Although traditionally, education about the environment has been the most prominent in schools, education for the environment (or 'education for sustainable development', a closely-related alternative) has been gaining in popularity, and its influence can be seen even in mainstream curriculum documents (Naish et al., 1987; NCC, 1990; CCW, 1992; CCW, 1993). This is especially clear with regard to the proliferation of documents which link environmental education with the idea of influencing attitudes and behaviour. Increasingly, the purpose of environmental education is being viewed as creating a new generation of concerned individuals with the skills and motivation to take action on environmental problems:

> *"Environmental education has the task of transforming the attitudes and behaviour of entire societies if a new conservation ethic embracing plants and animals as well as people is to become a reality."* (ICCE et al., 1984)

This aspect has filtered down into all aspects of environmental education, and has become a key area for research and discussion in the literature. Advocacy of values education of one kind or another is widespread, and it is commonly argued that teaching about environmental issues without considering values is an impossibility:

> *"Environmental problems are not simply technical but imply a complex system of values."* (Elliott, 1991)

Similarly, in a review of the research findings, Iozzi argues that because environmental problems are social as well as scientific, "... environmental attitudes and values issues must be important and prominent aspects of education programs taught in our nation's schools." (Iozzi, 1989, p. 6).

In geography too, attitudes and values have been given increasing emphasis, especially in relation to social and environmental issues. Raw comments:

> *"The recognition of values as an integral part of school geography is to be welcomed ... an understanding of major issues such as world poverty and environmental pollution is only possible through study of the values, beliefs and attitudes of decision makers."* (Raw, 1989, p. 19)

Frances Slater adds her support to the increasing concern with values in geography, and addresses some of the potential problems, such as the possibility of indoctrination; the question of whether controversial issues can be taught in a value-free way; and the problems of relativism. She concludes that:

> *"... an explicit knowledge of strategies for exploring and assessing values is a defence against indoctrination, that geography is not a value free subject, and that there are some ultimate values and moral principles that cannot be reduced to being relatively right or wrong, good or bad, desirable or undesirable, however problematic their implementation may be."* (Slater, 1993, p. 112)

This is indicative of the movement towards developing students' values or attitudes, rather than simply 'recognition' of different value positions, as suggested by Raw.

Caduto extends this argument further by advocating specific values education strategies for environmental issues on the grounds that environmental concern is a universal moral value:

> *"The philosophical underpinning for this comprehensive environmental values education approach is the existence of objectively verifiable values. These values have as their source religious beliefs and secular philosophies spanning 25 centuries of human moral development."* (Caduto, 1983, p. 17)

Although this view of environmental values as in some way 'objectively verifiable' is not widespread, many issues addressed in environmental values education do appear to reflect this perspective. For example, Knapp suggests as a question for investigation, "What are the energy alternatives most compatible with environmental quality?" (Knapp, 1983/ p. 24). The assumption within this question is that environmental quality is the most important and desirable value rather than, for example, economic concerns. He states that students will be 'exposed' to most values, rather than have them 'imposed' upon them but argues that the principle aim is to provide students with opportunities to, "... define, clarify and develop a personal value system leading to more moral environmental behaviours" (Knapp, 1983, p. 25). No explanation is

offered as to why developing the students' own personal value systems should lead them to 'more moral' environmental behaviours however.

The influence of the values education advocates, and the increasing move towards an approach in line with 'education for the environment' can be seen in many of the curriculum documents produced in the UK. For example, the NCC document, Curriculum Guidance 7: Environmental Education contains the following quote:

> *"[Teachers should be] ... promoting positive attitudes towards the environment by encouraging: appreciation of and concern for the environment; independence of thought; respect for others' beliefs..."* (NCC, 1990)

Similarly, the Schools' Council Geography 16-19 syllabus states that the course should:

> *"... enable candidates to acquire ... an attitude of concern for the quality of environments, for the condition of human life and for the biosphere as a life support system."* (ULEAC, 1996)

These statements reflect the international mood, and the increasing emphasis on students' attitudes and values.

Within schools, it has also been claimed that:

> *"... there are more and more teachers and students who are no longer satisfied with limiting EE to cognitive and affective dimensions and who seek to move beyond knowledge and attitudes to do something immediately to improve the environment"* (Posch, 1993).

The NFER research, cited earlier, illustrates this increasing emphasis on students' attitudes and personal behaviour with respect to the environment: When school managers were asked which aspects of environmental education were most important, their emphasis was very clearly on personal responsibility for the environment (62% described it as 'essential') and they were much less keen on dealing with the economic and political issues relating to the environment (16% and 14% respectively). Also, although the majority of schools did not have a formal EE policy, in those that did have one the most commonly mentioned aspect was the encouragement of pupils' positive attitudes - mentioned in 71% of documents (Tomlins and Froud, 1994).

This increasing emphasis on the promotion of positive environmental attitudes raises a number of questions both about the educational validity of 'developing students' attitudes', and also about the precise meaning of the term, environmental attitude. These two areas are discussed below (sections 2.2.3 and 2.3).

2.2.3 Controversies in environmental education

As the previous section shows, support for influencing environmental attitudes and behaviours through teaching about environmental issues is widespread - expressed not only by environmental educators, but also by government bodies, geography curricula, and many teachers who feel that this is an important part of their pedagogical role. However, encouraging students to become knowledgeable and responsible decision-makers is also an important pedagogical aim, and one which may be compromised by the advocacy of certain 'desirable' attitudes or behaviours. This conflict arises because students are encouraged to make independent decisions about controversial environmental issues, and yet must develop the required 'environmentally-sound' attitudes. Other potential problems with teaching controversial environmental issues relate to the lack of agreement about what type of environmental attitudes and behaviours should be encouraged; concerns about inculcation of positive attitudes and behaviours at the expense of knowledge about environmental issues; and a belief that schools are not appropriate sites for the development of students' attitudes and behaviours, especially where these attitudes are not universally held in the wider population.

Concerns about teaching controversial environmental issues therefore encompass 4 main areas, each of which will be addressed in turn:

1. Concern that teaching controversial environmental issues is too great a challenge for schools or for teachers
2. Concern that environmentally-sound attitudes are not agreed upon
3. Concern that developing attitudes might take place at the expense of knowledge
4. Concern that developing attitudes might take precedence over independent thought

<u>1. Concern that teaching controversial environmental issues is too great a challenge for schools or for teachers</u>

One limitation on the growth of teaching about controversial environmental issues is resistance from teachers or from the school. Despite the enthusiasm which some teachers show for environmental education, others are reportedly unconvinced that "... open exploration of a controversial issue such as (the greenhouse effect) is a welcome and desirable feature of education" (Wright, 1990/1991). Gayford (1991) explains this

reluctance to consider controversial issues by reference to concerns that "... environmental education may frequently be treated as a form of indoctrination" (Gayford, 1991). Moreover, Eijkelhof reports resistance from teachers to a suggested module concerning nuclear power, in part because the teachers felt that the issue was too political and they felt they were too involved in the issue to teach it in a balanced way (Eijkelhof, 1985). Similarly, Huckle suggests that teachers' perceptions of environmental education as political and controversial act as a constraint on the teaching of environmental issues in schools (Huckle, 1990). However, it can also be argued that avoiding bias altogether is impossible in any area of the curriculum, and that the role of the teacher is to alert the students to the possibility of bias in any information source (Finn, 1990). It is widely stated that the school cannot help but inculcate some values in its students, and that the very choice of subject matter and teaching methods are based on assumptions about value (Edynbry et al., 1977; Bridges, 1986).

However, other factors may also prevent teachers from introducing environmental issues into their teaching: they may feel that they have had insufficient training in teaching controversial issues, that they lack the relevant pedagogical skills, or that their level of knowledge about complex environmental topics is inadequate. Much school teaching involves imparting 'facts' to pupils, and questions are generally assumed to have only one correct answer, therefore the skills used are not ideally suited to teaching controversial issues (Geddis, 1991). Moreover, like other controversial issues, environmental issues are frequently highly complex, requiring knowledge of economic, sociological, political, historical and psychological factors for a full understanding (Stradling et al., 1984). Given that the teacher's normal role is to simplify the complexities of subject knowledge to help pupils grasp the key facts required for the examination, they may be currently ill-equipped to teach controversial environmental issues (Rudduck, 1986; Geddis, 1991). Thus, both 'subjective' and 'objective' constraints may act to prevent teachers from addressing certain controversial issues (Carr and Kemmis, 1986). Whilst the teachers' 'subjective' understandings of issues as controversial or unduly complex may act as constraints, the reality of 'objective' or structural constraints (such as a lack of time, or institutional norms), which prevent teachers from addressing such issues in schools, should not be ignored.

Moreover, the explicit focus of environmental education on attitudes and values may be threatening to schools, despite the wide acceptance that schools generally impart values through the 'hidden curriculum':

> *"Schools have typically resisted attempts to deal systematically with values education ... This does not mean that schools do not teach values - general values or moral values ... Yet, when someone suggests that values be taught systematically and deliberately in the classroom, the tensions build very rapidly."* (Iozzi, 1989, p. 9)

Moreover, the authoritarian nature of the traditional school does not provide an ideal setting for the more radical forms of environmental education since the authority of the teacher, and their need to exert control over the students, may make it difficult for students to develop intellectual independence. Students frequently accept what teachers say without requiring evidence or justification, purely because of the teacher's authority position in the classroom (Geddis, 1991). Education 'for' the environment has the aim of being "... a form of social education cast in ... the liberatory mould. This seeks to empower pupils so that they can democratically transform society" (Huckle, 1991, p. 61). However, since the organisation of most schools does not provide a model of participatory democracy, they appear unpromising sites for advocacy of this type of education. Moreover, the goals of environmental education place heavy demands upon teachers, and entail acceptance of a very different approach to pedagogy from that of traditional teaching.

Sterling also doubts the feasibility of such large-scale change within the school structure, suggesting that schools are likely, at most, to be able to consolidate values which are already changing (Sterling, 1990). In a later article, he also advises teachers not to move too far beyond dominant environmental values, due to the risk of a conservative backlash against all environmental education:

> *"Environmental education can encourage change where it extends existing social change, but it is doubtful that it can encourage change where green ideas are only weakly present in wider society ... If environmental education pushes too far and too quickly ... it will be accused of being 'unbalanced'."* (Sterling, 1991, cited in Fien, 1992, p. 46)

Even the strongest advocates of education 'for' the environment admit that implementing its aims will not be easy, and that teachers who attempt it may risk charges of indoctrination (Huckle, 1983; Fien, 1992). However, Fien suggests that a greater recognition of the political nature of all teaching would be beneficial, and claims that radical change is required if education is to have any impact on environmental problems (Fien, 1992).

2. Concern that environmentally-sound attitudes are not agreed upon

Another potential problem with environmental education is defining what is meant by a 'positive environmental attitude'. Although it may be possible to reach general agreement on some issues, there are likely to be many specific situations in which disagreement will arise. In addition, the value given to pro-environmental behaviours, as opposed to behaviours which might emphasise economic development thereby improving social conditions, is likely to be even more controversial. When even the facts concerning an environmental issue are in some doubt, the potential for disagreement over appropriate action is even greater. This was illustrated by a report in the Times Educational Supplement about environmental education in the US, where complaints have been raised about biased and dogmatic teaching. Dr Sanera, cited in the article, argues that students are being taught only one side of the controversies over issues such as acid rain, recycling, global warming, overpopulation and pesticide use:

> *"What is shocking is the degree of bias ... They assume that global warming is occurring and that we've got to take action, when many scientists say the opposite. And the economics of recycling is rarely mentioned. It's a mantra of mindless recycling. It's not presented as an objective issue."* (Marcus, 1997)

Jo Kwong also argues that the economic costs of taking certain environmental actions are rarely considered, nor are the other potential uses to which money could be put. She suggests that not recycling certain materials may be a valid pro-environmental behaviour since some recycling options "consume more resources than they conserve" (Aldrich-Moodie and Kwong, 1997, p. 106). However, this action is rarely considered as an appropriate pro-environmental behaviour in environmental education programmes.

Kwong asserts that there are some aspects of environmental awareness which are likely to be universally accepted, citing picking up litter, reducing energy use, properly disposing of toxic waste, and recycling materials which can be properly re-used as examples. However, she argues that some of the attitudes and behaviours advocated in schools are those of a group she terms 'professional environmentalists', consisting of campaigners for environmental non-government organisations. The specific actions they advocate are, she claims, not unbiased or uncontroversial, and therefore are unsuitable positions for teachers to take up (Aldrich-Moodie and Kwong, 1997). A further concern is that the attitudes and behaviour which are being taught by some forms of environmental education are those of apathy and inaction due to a feeling of powerlessness in the face of huge problems (Aldrich-Moodie and Kwong, 1997). It is asserted that environmentalists have often been overly pessimistic about future scenarios, and that students are not being given access to information about possible

controversies, or alternative hypotheses. Citing examples from both the US and the UK, Aldrich-Moodie and Kwong argue that many text books underestimate scientific uncertainty, giving the misleading impression that the issues are clear-cut and the effects certain and predictable if changes in behaviour are not made:

> *"Typical lessons teach children that acid rain is destroying our forests; overpopulation will exhaust our resources; the ozone layer is rapidly being destroyed; and global warming will lead to disastrous climatic change. Yet, each of these, and many other scare scenarios, have been widely debated or refuted by experts. Nonetheless, they are taught as facts, rather than hypotheses, to children."* (Aldrich-Moodie and Kwong, 1997, p. 96)

Given that the issues are surrounded by so much scientific controversy, these authors argue that teachers should not be taking an advocacy position on any environmental issue.

3. Concern that developing attitudes might take place at the expense of knowledge

A major concern about environmental education is that acquiring desirable attitudes is taking prominence over knowledge, and that children are therefore not receiving an adequate account of environmental issues. It is, argues Storm, "... easier to acquire approved sentiments than to build the necessary intellectual infrastructure ..." (Storm, 1990/1, p.31). A now-classic survey of 11000 English teenagers supports this position, demonstrating that they readily agreed with positive environmental attitude statements but that their factual knowledge was shaky at best:

> *"If a primary educational goal is to be the development of positive environmental attitudes ... then much effort and research must be directed toward establishing effective means for achieving this end. If attitudes of young people are to be translated into responsible social behaviour, it would appear that these attitudes should be deeply rooted and based upon knowledge, experience and conviction, rather than superficially 'learned' or instilled by indoctrination".* (Richmond and Morgan, 1977)

There is clearly a risk that environmental attitudes which are based on such a fragile knowledge base will be tentative and easily discarded. Storm argues that: "In its cruder forms, the evangelical approach substitutes slogans for analysis, and exhortations replace explorations ... And it doesn't work!" (Storm, 1990/1991, p. 32). However, schools may not be entirely responsible for the inadequate level of knowledge since less

than 40% of the young people surveyed identified school as their main source of environmental information.

In contrast to most of the environmental education literature, Jo Kwong feels that the development of positive environmental attitudes is the wrong goal entirely, arguing against what she perceives as educational attempts to convert school children into environmentalists. She accuses teachers of "slogan-generated advocacy" and states that instead children should be taught "basic sciences, outdoor education, conservation, and in later years ... problem solving skills." (Aldrich-Moodie and Kwong, 1997, p. 87). Current teaching methods, she argues, are based on "repetitive slogans to 'save the world' ..", rather than aiming to increase comprehension, resulting in:

> *"... children who can tell you what (they think) is right and wrong, but who are woefully ignorant of the reasons why these might be so. In essence, we are teaching children what to think, rather than how to think."* (Aldrich-Moodie and Kwong, 1997)

Recycling, one of the most commonly-taught issues, is cited as an example of how children are being taught appropriate pro-environmental behaviour from a very young age, with extremely limited understanding of the reasons behind the action. Teaching covers 'what can be recycled?', and 'how to recycle', but very rarely is 'why recycle?' considered as a question. She concludes by arguing that:

> *"Our educational goal should not rest on lofty statements about behaviour modification. They should not foist a range of trendy slogans upon our kids ... Our goals should be to open their eyes and impart knowledge."* (Aldrich-Moodie and Kwong, 1997, p. 122)

4. Concern that developing attitudes might take precedence over independent thought

The most widespread concerns about environmental education relate to its controversial nature and the potential for indoctrination of students. These concerns are amplified by the increasing advocacy of attitude or behaviour change. A common complaint about education 'for' the environment is that the role of education should be to encourage independent thought, not to promote a specific world-view:

> *"... education is concerned with enabling people to think for themselves ... education for anything ... is inconsistent with that criterion. In all cases, these phrases suggest a predetermined mode of thinking to which the pupil is expected to prescribe"* (Jickling, 1992).

Education 'for' the environment, Jickling argues, suggests the advancement of a particular agenda: Students are persuaded to take appropriate actions deemed to be in the common interest. However, he questions whether it is the job of education to make people think and behave in a particular way, arguing that this is suggestive of training-type exercises, rather than understanding and critical thinking, both of which should be key educational aims. Education 'for' sustainable development rests on two unchallenged assumptions, first that sustainable development is an uncontested concept, and second, that education is a tool to be used for its advancement. Both, he says, can be rejected (Jickling, 1992).

Geddis agrees that independent thought should take a higher priority than encouraging prescribed attitudes or behaviours, and expresses concern that rational thinking can be overlooked when controversial environmental issues are being taught. He rejects attempts to "foist ethical positions on students" and emphasises the need to subject differing viewpoints to rational criticism, arguing that the mere adoption of appropriate conduct is insufficient (Geddis, 1991, p. 170). Teaching which pays no attention to the need for evidence and rational argument, he argues, is teaching which makes no provision for the intellectual independence of students. This is a potential problem he identifies in some teaching about controversial environmental issues:

> *"When addressing issues such as acid rain, the extinction of species, the fuel crisis, teachers - who otherwise are quite conscientious in articulating the basis for their knowledge claims - sometimes teach in a manner which ignores the need for evidence and rational argument."* (Geddis, 1991, p. 171)

He cites evidence from a lesson about acid rain which suggested that the teacher had limited the students' opportunities for critical thought, by presenting a potentially disputable claim as established fact. The impression gained from the lesson was that the teacher was attempting to persuade the students rather than instigating an inquiry into the claim (Geddis, 1991).

Aldrich-Moodie returns to the origins of environmental education, and suggests that the basis for concerns about persuasion and indoctrination lie with its roots in the environmental movement, whose aims are political advocacy and action:

> *"(Environmental issues) are born of the environmental movement's desire to identify nature's ills and their remedies in a straightforward and urgent way that is readily communicable and serves as a basis for political action. Environmental issues are the outcomes of a rhetorical history and they show it."* (Aldrich-Moodie and Kwong, 1997, p. 79)

This history, he argues, leads to simplification of issues in the pursuit of an ideological agenda, and brings the aims of environmental education into conflict with the traditional aims of education. Whilst accepting this as a potential problem, other authors consider school to provide an unrivalled opportunity to counter such bias from other sources such as the mass media (Stradling et al., 1984; Finn, 1990).

Nonetheless, it should not be assumed that teachers have substantial influence over their students. Students, especially at secondary school, may already hold strong opinions, since they cannot fail to be affected by the 'curriculum' offered outside the school, and the teacher's influence may be minimal compared to the media, family and friends (Stenhouse, 1967; Kelly, 1986; Haydon, 1997). Studies of environmental issues in the US (Hausbeck et al., 1992), and Australia (Connell et al., 1999) have indicated that television is the most frequently quoted source of information and there is no reason to suppose that the situation is any different in Britain. Even Aldrich-Moodie does not believe that pupils are "uniquely receptive targets of indoctrination", or that they are likely to become "brainwashed environmental activists" as some fear. But, he says, they may miss opportunities to consider the full range of possible viewpoints, and develop deeper, more informed understandings (Aldrich-Moodie and Kwong, 1997).

2.3 The nature of environmental attitudes

As shown in the previous section, the environmental education literature is littered with statements about attitudes, values, and attitude change. Despite the few vehement critics of current trends in environmental education, there is still apparently wide agreement about the benefits of developing students' environmental attitudes or values. Summarising the literature, Clare Palmer writes:

> *"... on paper, and in principle, there is widespread agreement about the importance of environmental education ... at the heart of all recent work on environmental education has been an ethical imperative - that environmental education should be about* ***changing values.***" (Palmer, 1997)

Nevertheless, to date, the environmental education literature has given very little consideration to the nature of attitudes and values and how they relate to the environment. Research in environmental education has been criticised in the past for failing to define key concepts used (Stewart, 1982), and for the lack of critical analysis of the attitudes and values which many environmental education documents promote (Palmer, 1997). Given potential concerns about issues such as indoctrination, the apparent consensus over attitude promotion may point to the existence of differing interpretations of these poorly defined concepts. In the following discussion, an attempt is made to clarify the meaning of the term 'environmental attitude', and to consider the similarities and differences between the kinds of environmental attitudes or values which are advocated in various documents, including the 16-19 syllabus. The discussion aims to clarify what might be meant by the syllabus claim that courses should,"... enable candidates to acquire ... an attitude of concern for the quality of environments, for the condition of human life and for the biosphere as a life support system" (ULEAC, 1996).

2.3.1 Defining an environmental attitude

The term, attitude, has a long and chequered history in psychological research. It has been described as one of the key concepts in social psychology (McGuire, 1986; Jaspars, 1990; Eagly, 1992), but the problem of definition has never been fully resolved. Regarding the literature in this area, McGuire comments:

> *"... some degree of conceptual refinement is needed to clarify attitudinal constructs to oneself and others, but workers in an area tend to continue elaborating definitions and distinctions until the accumulation becomes impenetrable jargon to outsiders and stultifying distractions to initiates."* (McGuire, 1986)

A multitude of definitions of attitude - a central tenet of social psychology since the 1920s - exist in the literature. However, there is continued debate on the structure and functioning of attitudes and recently, various challenges to the concept itself, in the form of alternatives such as 'social representations' (Moscovici, 1988), and 'linguistic repertoires' (Potter and Litton, 1985).

In the environmental education literature, the problem of conceptual clarity is almost the reverse, in that the terms attitude and value are frequently used uncritically, and very little discussion of the nature of environmental attitudes exists (Gayford, 1995). An extensive search of the environmental education literature yielded only one definition of

environmental attitude, and this was briefly referred to in the opening paragraph of a paper by Yount and Horton. They state that:

> *".. (an) environmental attitude can be considered an enduring positive or negative feeling towards a particular aspect of an environmental conflict .."*
> (Yount and Horton, 1992)

This definition appears based on the recent psychological tendency to provide "a unidimensional definition of an attitude in which evaluation is central" (Tesser and Shaffer, 1990, p. 481). This approach avoids the problem of earlier models which included a behavioural aspect (Fishbein and Ajzen, 1975), thereby bypassing the thorny issue of attitude-behaviour discrepancy. An underlying assumption of much attitude research has been that by changing the attitudes of individuals it is possible to influence their behaviour. However, the evidence in support of this link is, at best, scanty, and predicting an individual's behaviour from their attitudes is unreliable, leading McGuire to describe low attitude-behaviour correlation as "the scandal of social psychology" (McGuire, 1986, p.92). This problem is central to environmental education, in which the underlying aim often appears to be behavioural change.

2.3.2 Previous research on environmental attitudes

Considerable research has been undertaken in relation to environmental attitudes, largely through US projects which have attempted to measure the effect of specific programmes on students' attitudes towards the environment (See reviews by Hines, 1987 and Iozzi, 1989, and more recent work by Uzzell 1995, 1999 in the UK). Other American and European studies have surveyed students' attitudes towards the environment (Richmond and Morgan, 1977; Lyons and Breakwell, 1994; Scott and Willits, 1994; Morris and Schagen, 1995), or examined the relationship between students' knowledge and attitudes towards the environment (Borden and Schettino, 1979; Alaimo and Rooney, 1980; Hausbeck et al., 1992; Gomez-Granell, 1993; Showers and Shrigley, 1995; Kuhlemeier et al., 1999). However, a key aspect of previous research has been the almost ubiquitous use of attitude scales, and the results have been largely inconclusive or contradictory[1]. This is a common problem reported with research using attitude scales: Differences can be observed between responses from the same person when questions are worded or ordered differently, or even when the same test is administered to the same individual at a different time (McGuire, 1986). Two key attitude theorists write scathingly about their reliability:

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[1] A notable exception is the recent work by Connell et al. (1999), in which qualitative methods were used to investigate students' environmental attitudes.

> *"Of recent studies that have reported the use of more than one attitude measure, about 70% have found different results."* (Fishbein and Ajzen, 1975)

Moreover, there is some doubt about whether it is possible to change people's attitudes. It is generally agreed that attitudes are not unchanging, but develop and form throughout people's lives. However, a plethora of work over many years has failed to provide much insight into how such attitude change might be influenced (see Hovland, 1953 and 1957 for classic examples of such research).

In general, the results from many surveys using scales designed to measure attitudes seem to suggest that many people have little or no ideological coherence in their attitudes:

> *"... people frequently report having no opinion on issues vitally affecting them or can give no reason for holding the opinions they do, or give erroneous reasons, or reasons that support a contrary opinion ... Frequently also, people hold opposite opinions on several manifestations of the same principle or hold an opposite opinion on the general principle from those held on most of the specific instances on which it would seem to be based."* (McGuire, 1986, p. 116)

Since these results seem counter-intuitive, some researchers have attempted to redefine scales in an attempt to provide more 'reliable' results (McGuire, 1986), but others view this as an inherent flaw in attitude research and the way in which it has been conducted. The theoretical concept of an attitude and the idea that it can be measured by personal responses to an attitude scale are suggestive of an enduring cognitive state which is reflected in language. (This conceptualisation is also apparent in Yount and Horton's definition of an environmental attitude as an 'enduring feeling'). However, a number of researchers in social psychology have challenged these assumptions and assert that the inherent variability in respondents' accounts argues against the notion of a stable mental state (Potter and Wetherell, 1987), and that the social context should be taken into account (Moscovici, 1981).

Nonetheless, the environmental education literature adheres to a fairly simplistic notion of attitudes, and many authors assume the existence of some kind of general pro-environmental attitude. Providing a notable exception, a paper by Witherspoon and Martin (1992), reviews 30 years of environmental debate, and argues that the emphasis on different types of attitude has changed throughout this period, moving from a

concern with pollution and nuclear issues, through a focus on land use and waste disposal, to the more recent interest in global issues such as rainforest destruction, ozone depletion, and global warming (Witherspoon and Martin, 1992). Thus the types of environmental attitude advocated through environmental education would be expected to change as issues of current concern varied. In addition, the results of Witherspoon and Martin's work, and that of others, indicate that attitudes to different environmental issues are held by different groups of people. For example Heath *et al* found that attitudes towards nuclear power are qualitatively different from attitudes towards countryside protection and are held by different groups of people (Heath et al., 1991). Witherspoon and Martin found three different groupings of 'green attitudes', which they labelled, 'global green scale', 'pollution scale', and 'nuclear power scale' (Witherspoon and Martin, 1992). Although these scales were highly correlated with each other, they also had very different correlations to other scales concerning environmental behaviour. Therefore, the authors refute the idea of a coherent green view, and argue instead that there are "clusters of attitudes with more or less strong links between them" (Witherspoon, 1992, p. 19). This may explain some of the inconsistencies revealed in previous research.

2.3.3 Analysis of environmental attitudes in the literature

The existence of a variety of qualitatively different types of environmental attitude may also go some way towards explaining the apparent wide agreement between very different groups over the aim of promoting positive environmental attitudes. It may be that the types of attitude envisaged by those groups are in fact very different. Claire Palmer notes that the values advocated by different environmental education documents often differ widely from one another, and suggests that the language of environmental education has a multitude of different interpretations and meanings:

> *"That this is so is not immediately obvious, because very few documents about environmental education actually explain what they mean by 'education for the environment' or the need for 'a new environmental ethic' or a 'change in environmental values'. Beyond the most basic generalisations concerning, for instance, 'caring for the environment' there is no further description of the kind of ethic advocated."* (Palmer, 1997)

To demonstrate this point, Palmer compares the NCC's *Curriculum Guidance 7: Environmental Education* (referred to here as CG7) with a book by David Orr, *Ecological Literacy* (1992), and reveals very significant differences between the values expressed by each.

CG7 emphasises a view of the environment as a resource to be managed and used, and as something which is problematic. It views humans as separate from their environment, and promotes individual rather than collective (or political) action in response to environmental protection (NCC, 1990). The over-riding values which it expresses are *instrumental*; they are seen as a means to an end, the end being human well-being. However, there is also a hint of another type of value an *intrinsic* value suggested, Palmer argues, by a statement listed under 'desirable attitudes', and described as, ".. appreciation of, and care and concern for the environment and other living things". This suggests that the environment does have a value other than as a resource for humans' use, but this seems to be in conflict with the emphasis on resource value, and is marginalised in the document.

The values expressed by Orr, in contrast, rest on something more akin to religious value, a moral commitment to life:

> *"Education ... demands an uncompromising commitment to life and its preservation ... (which) rests on a deep sense of the sacredness of life, expressed as love, creativity, wonder, faith and justice."* (Orr, 1992 p. 133)

As Palmer points out, the differences between the documents are hardly surprising, given the sources (one a government body, aware of the interests of industry, and the importance of the economy and employment, the other an academic and self-professed deep green ecologist). However, the comparison does show the vast range of possible interpretations of what had seemed to be a widely agreed upon educational aim.

In terms of this research, the key area of interest is in the kinds of environmental attitudes and values which are expressed by the 16-19 course literature. A brief look at the 16-19 syllabus indicates a view of environmental attitudes which resembles that of CG7, the first page hinting both at a view of the environment as separate from people, and also of the environment as problematic:

> *".. this syllabus is characterised by ... emphasis on understanding the inter-relationships between people and their varied environments; study of the issues, questions and problems which arise from these inter-relationships; appreciation of the special contribution of geography to the understanding and possible solution of the problems, resolution of the issues and answering of the questions."* (ULEAC, 1996)

The focus on people-environment issues, and on 'natural and human systems and their inter-relationships' is found throughout the syllabus, suggesting a view of humans as outside of the natural environment. The titles of various modules also support the view of the environment as a problem and as a resource to be managed, including: Managing Landform Systems; Climatic Change and Uncertainty; Response to Difficult Environments; Natural Hazards; Pollution of Natural Environments; Managing Woodlands and Forest; Potential of Oceans and Seas. These are organised under four major thematic headings, 'The Challenge of Natural Environments'; 'The Use and Misuse of Natural Resources'; 'Issues of Global Concern'; and 'Managing Human Environments'. Such titles suggest a concern with the environment as a resource to be managed by humans. This view of humans as separate from nature and of the environment as a resource place the syllabus firmly in the position of advocating 'conventional values' as opposed to 'green values', described by Pepper (Pepper, 1996).

So far, the analysis of the 16-19 syllabus seems to suggest an outlook very similar to CG7, in which positive environmental attitudes or values relate to *"using the environment caringly* and finding *solutions to environmental problems"* (Palmer, 1997). However, where it specifically refers to attitudes and values, there are hints of other possible desirable goals:

1. an attitude of concern for the quality of environments, for the condition of human life and for the biosphere as a life support system;
2. the ability to relate to the environment and to sense conditions which either enhance or threaten the survival of living things;
3. an approach to learning which will facilitate awareness of the nature and significance of attitudes and values in environmental questions, issues and problems;
4. the opportunity to clarify and develop personal values in relation to environmental questions, issues and problems.

Statement two is particularly interesting in this respect, although it is not clear exactly what is meant by 'an ability to relate to the environment', or 'to sense conditions ..'. However, it does seem indicative of a more personal interaction with the environment, reflecting a less managerial view, and perhaps suggesting that caring for the environment is worthwhile for intrinsic reasons, rather than solely because of the importance of the environment to humans. Statement one is also interesting in that it could be interpreted either as an anthropocentric view of concern for the environment and the biosphere as human resources, or as intrinsic goods, the meaning is not clear

from the context. It perhaps intends to imply that both are important - that we should have concern for the environment in it's own right, but also in the interests of humans. However, the overall picture is of a resource-based view of the environment, with the image of humans as 'managers' of the environment running throughout the course. The emphasis within each module is on a description of the issues, analysis of different management options, and decision making, taking account of the views of different groups of people. There is rarely a challenge to the underlying structures of decision making or radical alternatives proposed.

It is clear from this brief discussion that 'environmental attitude' is a fundamental concept which is poorly understood and highly ambiguous. Even within the 16-19 syllabus, there are a number of possible interpretations open to teachers, depending upon which section of the syllabus is consulted. This leaves teachers with little guidance on appropriate environmental attitudes to encourage, and even less guidance on how this might be achieved.

2.4 Suggested pedagogy for teaching controversial environmental issues

For the purposes of this research, the main concern is with the controversial aspects of environmental issues. It is these aspects which are considered to provide the greatest potential for understanding how the syllabus focus on attitudes and values might be interpreted in classroom teaching. The term 'controversial issue', in this context, refers not to controversies concerning competing scientific theories (Deardon, 1981), although these may be pertinent to environmental issues such as global warming. This type of controversy, such as the precise rate of global warming and consequent sea level rise could (at least potentially) be settled by further research or experimentation. In this research, the term 'controversial' was taken to mean:

> *".. matters about which rational people may hold distinctly different views and about which there is no generally accepted viewpoint"* (Gayford, 1987).

This type of controversial issue cannot be settled by undertaking further research since it involves some degree of value-judgement (Stenhouse, 1970; Wellington, 1986). For example even if the precise rate and causes of global warming were fully understood, controversy would remain over the importance of preventing further warming since the answer to this decision would depend on the relative value placed on the environmental damage, as compared to the cost of taking avoidance measures.

Given the controversial nature of many environmental issues, it should be possible to extract some guidance on pedagogy from the literature on teaching controversial issues. Advice is offered on decisions concerning the teacher's role and responsibilities in classroom discussions: What are the most appropriate teaching strategies? Should teachers support all viewpoints offered? Should they express their own opinions? Or should they remain entirely neutral? In this section, the controversial issues literature is discussed alongside the environmental education literature, to enable the consideration of two key areas, namely the possible roles available to the teacher of controversial issues (section 2.4.1), and the choice of teaching strategies available (section 2.4.2).

2.4.1 The role of the teacher in teaching controversial environmental issues

Much of the literature on the practical aspects of teaching controversial issues deals with the teacher's role in the classroom. Five alternative roles which the teacher might adopt are suggested below. Although the approaches are discussed separately, in practice teachers may use a combination of different roles depending on the specific issue or lesson circumstances.

i) Avoidance

Described by Kelly as 'exclusive neutrality', advocates of this position avoid introduction of any topics which are controversial, and thereby avoid consideration of matters concerning attitudes and values (Kelly, 1986). It is argued that providing an impartial hearing for different points of view is extremely difficult, and that teachers should therefore confine themselves to the 'value-free' teaching of knowledge. Some advocates believe that schools are inappropriate sites for the consideration of attitudes and values, others are of the opinion that merely increasing students' knowledge about environmental issues will lead to more positive environmental attitudes. However, there is very little evidence that merely increasing students' level of knowledge leads to an increase in positive environmental values and even less that it will lead to behavioural change (Costnzo et al., 1986; Iozzi, 1989; Eagly, 1992). Moreover, this approach is criticised for its unwavering acceptance of the myth of value-free education and the belief that it is impossible for teachers to address controversial issues in a fair impartial manner:

> *"Not only is the fair handling of controversial issues in classrooms a feasible one, it is also a compelling one."* (Kelly, 1986, p. 116)

Whilst it is true that students cannot be expected to reach sound value judgements without a clear understanding of the facts that relate to the environmental issue being studied, consideration of the attitudes and values of key decision-makers and pressure groups could facilitate a deeper understanding of the situation (Slater, 1993).

ii) Neutrality

The Humanities Curriculum Project, one of the first to give controversial issues serious consideration, advocated procedural neutrality in order that teachers did not use their position of authority to promote their own opinions (Schools Council / Nuffield Humanities Project, 1970). Procedural neutrality involves adopting the role of an impartial chair of discussions, ensuring that all students have a say and that their opinions are listened to and treated equally. Advantages of this approach are that it minimises the possibility of teacher bias; it enables all students to take part in the discussion; and it offers good opportunities for students to develop their communication skills (Stradling et al., 1984; Slater, 1993). Its advocates claim that teachers should be cautious of expressing their own views, given the likelihood that some students will automatically accept their view as the 'right' one:

> *"The adoption of a procedural neutrality is a way of emphasising that in the context of handling controversial issues the teacher's commitment is to education and not to his or her own views."* (Rudduck, 1986)

Rudduck argues that if teachers express their own views, these are unlikely to be challenged or critically evaluated by the students, thereby leading to the risk of indoctrination.

However, the neutral approach is often difficult for teachers to maintain and becomes especially problematic if the range of opinion amongst the students is narrow and a premature consensus is reached (Stradling et al., 1984). The unwillingness of the teacher to challenge students' arguments can lead to views becoming more entrenched, therefore the teacher may wish to get more involved in the discussion occasionally, in the interests of good education, perhaps to air a view not held within the class (ILEA, unpublished). It has also been suggested that students may find the teacher's neutrality artificial or unsettling if they are unused to the approach, and that it may be unproductive with less able students (Kelly, 1986; Slater, 1993). A final concern is that it can give students the impression that the teacher is indifferent to the issue, and it is therefore not important (Gayford, 1987; Solomon, 1993). If teachers believe that it is important to hold views on issues of public concern, then it is essential that they set an appropriate example:

> *"Teachers should demonstrate their open-mindedness and in this way setting an example by taking a stand in a reasonable manner, thus showing their position is open to argument and revision. The danger with neutrality is that it is associated with lack of well formed opinion and commitment."* (Gayford, 1987, p. 9)

Kelly argues that the influence of the teacher is easily exaggerated, and that independent student thought is not dependent upon teachers concealing their own point of view. In addition, he argues, students will be in a better position to assess differing arguments if they are aware of the teacher's general and specific views, given that these are likely to be revealed in some way in the teaching (Kelly, 1986).

iii) Balance

An alternative option is to present a 'balanced' picture which "recognises all points of view" (NCC, 1990). This enables the teacher to articulate any argument which appears to have been excluded by the students, thus enabling access to a wide variety of views, and is a role advocated by many teachers. Huckle argues that balance can enable avoidance of indoctrination whilst introducing pupils to wide range of ideas. He claims that a balanced approach demonstrates a commitment to:

> *"... justice, rationality and democracy, rather than to a form of neutrality which leaves existing patterns of power and privilege undisturbed"* (Huckle, 1990, p. 159).

Slater suggests that the approach is most useful when there is considerable conflicting information, or when the students are polarised on an issue. In this situation, the introduction of a wide range of views can suggest possible compromise positions (Slater, 1993). Taking a balanced approach entails recognition of various issues such as quality (can dull, boring, cheaply-produced pamphlets be balanced against glossy magazines and imaginative video resources?); quantity (should an equal amount of time be spent on each differing perspective, or an equal number of resources used?); and also breadth (how far should the teacher go in considering obscure or minority perspectives?). These are essential considerations in determining how to present a balanced picture of a controversial issue (Wellington, 1986).

The balanced approach has been criticised for leading to a polarisation of views, thus simplifying the issues. Two equally extreme views may be presented as the two sides of the argument, ignoring the fact that many people's opinions lie somewhere between

the two (ILEA, unpublished). It can also result in very teacher-directed lessons, since the teacher is viewed as the provider of balance (Slater, 1993). Moreover, any two teachers are likely to hold differing views of balance. In maintaining the principle of balance, teachers might consider it inappropriate to give detailed attention to the views and activities of any political group whose policies are illegal or considered immoral, but this decision is likely to be highly subjective (ILEA, unpublished; Stradling et al., 1984). There are also questions over the feasibility of teachers presenting arguments equally when they disagree with some viewpoints, and the same criticism can be applied to many text book accounts of environmental issues. Aldrich-Moodie reports that the discussion of such issues in text books is often "inaccurate or lopsided" (p. 14), and continues:

> *"Researching these environmental issues has given me a healthy respect for teachers trying to make out a balanced account of current knowledge for their pupils. While the standard popular presentation of environmental issues is often flawed, books put out for the general reader which claim to debunk environmental myths frequently suffer from the opposite bias."* (Aldrich-Moodie and Kwong, 1997, p. 15).

iv) Commitment

Some people strongly criticise both neutrality and balance, and argue that teachers should at least indicate which point of view they believe the evidence to support (Warnock, 1975). It is claimed that students will attempt to guess what the teacher's views are anyway, and that if the teachers state their own opinions, students can at least take account of any potential bias (Kelly, 1986; Slater, 1993):

> *"... students could well profit from knowing teachers' general ideological persuasion and specific position on concrete issues ... no matter how vigilant or circumspect a teacher may be, it is nearly impossible fully to conceal the nature of one's beliefs, particularly to those with whom one is in daily contact."* (Kelly, 1986, p. 127)

It has also been suggested that teachers will lose credibility with their students if they do not say what they think, and also that some issues (such as racism or sexism) are so important that impartiality is inappropriate (Stradling et al., 1984). Similarly, Bridges cites an essay entitled 'Repressive Tolerance' which suggests that acceptance of all alternative points of view may actually represent a form of oppression since, by protecting freedom of speech, discriminatory practices are allowed to continue unchallenged (Marcuse, 1976, cited in Bridges, 1986). However, Bridges emphasises

the difficulty of providing a solution to this problem - even if its grounds are accepted - in that the differentiation between progressive or liberating opinions and oppressive ones requires a judgement which is far from self-evident (Bridges, 1986).

In its strongest form, a committed stance involves what Kelly describes as 'exclusive partiality', defined as a deliberate attempt to persuade students to accept a particular position on a controversial issue, thereby ignoring or dismissing other points of view (Kelly, 1986). This position may be taken up because a teacher views the issue as uncontroversial (their own view being the only adequate position), or because of an assumed duty to pass on particular moral or social values. Some supporters of this approach believe that value neutrality is absolutely impossible in a school setting and therefore that teachers who refuse to take a stand are merely making way for others, with perhaps less understanding, to exercise moral authority over the students (Jarrett, 1991). This appears to be the stance taken by a number of authorities on environmental education, influenced by a perceived need to encourage the development of appropriate attitudes and behaviours towards environmental protection (see section 2.1). This is clearly seen in the 1987 document, 'Our Common Future' which states:

> *"Sustainable development has been described here in general terms. How are individuals in the real world to be persuaded or made to act in the common interest? The answer lies partly in education, institutional development, and law enforcement."* (WCED, 1987)

The emphasis here on 'persuasion' is clearly suggestive of a committed role for the teacher. Apparently the authors consider that in the circumstances of widespread global environmental problems, the ends justify the means.

However, this position can be challenged on several grounds, primarily that it is both unfair to students, since they are not being provided with a realistic view of the issues, and also that it is likely to be ineffective in achieving its proponents' aims:

> *"Not only is exclusive partiality a capital assault on the integrity and purpose of the intellect, it is also presumptuous and likely self-defeating in practical or instrumental terms ... by failing to expose students to the best possible arguments and how presumably these can be effectively rebutted, the strict partisan is essentially fabricating intellectual straw people vulnerable to the serious challenges from competent adversaries."* (Kelly, 1986, p. 119)

It also should be avoided, he says, on moral grounds since it leads to:

> *"... infringing students' rights and their opportunity to make informed independent judgements after due consideration of alternatives."* (Kelly, 1986, p. 121)

Bridges similarly criticises this approach, stating that the teacher's decision to instil particular values offends against other values such as respect for other people, and personal autonomy. It is also, he argues, dishonest to present as 'true' anything that cannot be verified with publicly demonstrable reasons or evidence, and it encourages students to hold beliefs dogmatically and irrationally (Bridges, 1986).

A less dogmatic interpretation of the committed approach suggests that teachers should be able to express their own views, but should explicitly encourage students to critique and evaluate these views alongside other positions (ILEA, unpublished; Kelly, 1986; Gayford, 1987). Kelly describes this approach as 'committed impartiality', and argues that it enables the teacher to relate to students as equals through genuine discourse and in an atmosphere of mutual trust (Kelly, 1986). This position reflects an ideal of the teacher as a 'personal witness', who demonstrates to students their own commitment to issues of public importance, and who believes that students should do so too. Gayford supports this stance, emphasising that, although it is essential that teachers' commitment is not translated into indoctrination and propaganda, it is also important that the ability of the teacher to provide a model for the pupils is not lost:

> *"The experience for the pupils of seeing strong commitment to important issues facing mankind today is an element in the education of young people which should not be allowed to disappear, however well-meaning the intention."* (Gayford, 1987, p. 9)

Slater, however, warns that teachers should state their views only at the end of a discussion, and only if students' dissenting opinions can be treated with respect (Slater, 1993). It is also important that the teacher make clear that other teachers or pupils' parents may disagree with them, and to explain that such disagreements are legitimate and that pupils need to weigh up for themselves the evidence and form their own opinions (ILEA, unpublished).

Kelly details possible criticisms of this approach, primarily focused on the potential for teacher disclosure to become advocacy or indoctrination. He cites critics who claim that the conditions in schools and in the classroom make the equal sharing of views an impossible ideal. They argue that:

> *"Conditions in the classrooms such as unequal power, compulsory attendance, and pressure for grades create an atmosphere where teacher self-disclosure, no matter how understated, is implicit advocacy."* (Kelly, 1986, p. 131)

Bridges (1986) also expresses reservations about students' ability to separate teachers' authority on factual matters from their stated position on controversial issues, and Slater (1993) suggests that students often find it difficult to distinguish facts from values, and may become confused by the teacher's disclosure. In these conditions, students may be inhibited from arguing against the teacher, thereby limiting classroom discussion or, in contrast, may argue strongly against the teacher regardless of their own personal views.

v) Devil's advocate

Seen by some as an extension to the notion of balance, playing devil's advocate allows teachers to take account of students' prior beliefs and values in structuring their teaching. According to its supporters, this approach enables 'balanced learning' (see Stradling et al., 1984), whereby the teacher seeks to present students with an alternative view to their own at all times, to make them more aware of other viewpoints. It is said to be very effective in stimulating students to contribute in discussions, and essential to enable an alternative view to be provided when all students share the same opinion (Slater, 1993). The aim of the strategy is to encourage students to question the assumptions underlying their own opinions (Solomon, 1993). It has been argued that, since pupils do not come into schools with open minds, the teacher should draw out pupils' knowledge, experience, beliefs and views so that they may, in the interests of balance, make available a fuller appreciation of the range of perspectives on a topic (ILEA, unpublished). However, the potential problems with this approach are clear - if students, their parents, or other teachers assume that the views presented are the teacher's own, the charge of indoctrination is highly likely. This approach is also criticised by Stradling et al. (1984) on the grounds that it could cause students' views to become more entrenched, as they feel compelled to support the view that they initially expressed even in the light of new, contradictory information; or alternatively that competitive polarisation may divide the class, again resulting in entrenched views (Stradling et al., 1984).

2.4.2 Teaching strategies for controversial environmental issues

A second practical issue of crucial importance in the teaching of controversial environmental issues is the decision about an appropriate teaching strategy. Two types of strategy are frequently advocated in the literature, namely discussions and values education strategies. The choice of one of these strategies may depend upon the specific role chosen by the teacher - for example, the adoption of teacher neutrality is generally associated with a strategy of classroom discussion with the teacher as neutral chair (see (i) below); on the other hand, commitment to certain environmental values might suggest that some kind of 'values education strategy' would be appropriate (see (ii) below). However, like the teaching roles described above, teachers may be flexible in their choice of an appropriate strategy, depending on the specific issue, group of students, and age or ability level.

i) Discussion

Discussion is frequently advocated as a productive learning strategy in many areas of the curriculum, and has an especially long tradition in the humanities. Stenhouse was one of the earliest advocates of the use of discussion, stating that:

> *"Discussion of the humanities allows one to handle personal experience through the experience of others, and thus to protect oneself from intrusion."*
> (Stenhouse, 1967, p. 137)

The Humanities Curriculum Project represents one of the first attempts to consider controversial issues through classroom discussion, taking the stance that such issues, based on value judgements, did not have a single 'right' answer and that therefore discussion was a particularly appropriate way for students to increase their understanding (Stenhouse, 1975). In this context, discussion is used to enable students to gain access to a variety of views, and to question others to increase their understanding. Stenhouse also advocated discussion as a method of reducing the influence of the teacher, whose intended role was that of 'neutral chair'.

This view of discussion is supported and elaborated on by Rudduck for use in teaching controversial issues, following the principles of the Humanities Curriculum Project:

> *"... the mode of enquiry in controversial areas should have discussion rather than instruction as its core ... the discussion should protect divergence of view among participants and not force a consensus ... the teacher as chairperson of the discussion should have responsibility for ensuring proper exploration of the issue, using evidence as appropriate ..."* (Rudduck, 1986, p. 8)

Students are encouraged to arrive at their own understanding of the issue after consideration of a variety of perspectives, and the critical examination of evidence. Rudduck emphasises the importance of having available appropriate evidence (in the form of views and experiences of different people presented through words and images) to prevent the mere "pooling of ignorance" which can occur in such discussions (Rudduck, 1986).

Although the concept of open discussion and neutral chairing attracts widespread support, Rudduck comments on various problems in practice. Being unused to learning from each other or taking the initiative, pupils tend to address questions or comments through the teacher, rather than interacting with other pupils. Such discussions can also lead to an easy acceptance of consensus and avoidance of difficult issues. Alternatively, discussions can become polarised, often along gender lines, and conflict rather than co-operation is expressed through angry, fast-paced exchanges with little opportunity for reflection. Problems can also be caused by silent pupils, by dominant pupils who may take on bizarre roles to gain attention, and by pupils with minority views becoming objects of ridicule (Rudduck, 1983). Billig argues that the expression of people's opinions is modified by the 'discussion situation' (Billig, 1987). In polite conversation, this may lead to a search for conformity, but in classroom discussions different pressures apply which may lead individual students to either consistently agree or disagree with the teacher, regardless of their own views.

Similarly, Jones describes a tendency of some students (particularly boys) to express extreme views as a challenge to the teacher and a reflection of 'street norms', rather than their own personal thoughts and feelings. The atmosphere of whole class discussions may encourage these kinds of comments, which are often left unchallenged by other students in such a public forum. A challenge from the teacher in these circumstance is likely to be unproductive (and, in any case, a teacher acting as neutral chair would want to avoid intervention), therefore such comments are unlikely to be criticised (Jones, 1988). Jones suggests moving furniture to enable the discussion to take place between students without the teacher as constant mediator, and Gage and Berliner (1988) cite evidence that suggests that a decentralised structure (such as a horseshoe arrangement) helps foster discussion and prevent teachers and assertive students from taking over. Delegation of the role of chair of discussion to one of the students is also suggested, leaving teachers to concentrate on following the discussion and making notes, and increasing the opportunities for student participation (Gage and Berliner, 1988). In addition, teachers should take a firm line on the rules of discussion (and on repeated trouble-makers) to create an open atmosphere where personal views can be explored

without fear of ridicule (Jones, 1988). To prevent the students acting as a conservative force, Rudduck argues that teachers need to spend time getting students accustomed to the approach, which may well represent a sharp break from normal classroom practices (Rudduck, 1986).

Gage and Berliner point out that the teacher's attitude is also an important factor in the success of discussions: Teachers need to be tolerant of the low degree of structure which often exists in discussion situations; must have the intellectual ability to follow the complexities of discussion and pull out key points; and must be prepared to relinquish some degree of control over the learning situation (Gage and Berliner, 1988). Rudduck also notes that many teachers found discussions about controversial issues difficult to manage, and neutrality difficult to maintain. There was a common tendency to interrupt students or uncomfortable silences, to rephrase students' comments, or to add confirming comments, such as 'well done'. Teachers were also found to transmit their own interpretations through their questions, and to push for consensus (Rudduck, 1986). Nonetheless, Bridges gives some support to the argument that pupils have a right to know what the teacher thinks, and that a discussion in which the teacher refuses to state a view is not an open one:

> *"... for the teacher to adopt the role of procedural neutrality is for him to deny the group opinions which the group is in some sense entitled to as part of the reciprocal engagement of discussion; which the group requires as one among the range of significantly different points of view that are socially available; and which the group requires as a basis for challenging and criticising the opinions received from e.g. the media or their peers."* (Bridges, 1979)

However, he also accepts the evidence from the Humanities Curriculum Project, and others, that pupils found it extremely difficult not to ascribe authority to the teachers' opinions if expressed in discussion. He therefore suggests that the notion of neutrality should be considered as a step towards 'weaning' students from an uncritical acceptance of the social authority of the teacher.

The problems of whole-class discussion have led some to advocate small group discussions as providing a more supportive environment for consideration of controversial issues (Gage and Berliner, 1988; Solomon, 1992; Gayford, 1993; Solomon, 1993). Solomon (1993) claims that whole-class discussions are often unwieldy; small groups, where students arrange, lead and report on discussions themselves tend to be more successful. For shy students or those who haven't yet worked out a position, a small group may be the perfect place for discussion of values.

Her small-scale research suggests that students can gain valuable skills from taking part in small group discussions, and that their discussion skills show clear improvement with increasing practice (Solomon, 1992). Moreover, Gayford researched the use of National Curriculum skills in small group discussions on a controversial issue, and found that the desired skills were used regularly, and that students enjoyed this kind of activity and responded well (Gayford, 1993). Gage and Berliner (1988) also support small-group teaching of controversial issues on the grounds that it is "useful in fostering the ability to think critically" (p. 430), and forces the students to support their opinions. In addition, they argue that it helps students develop and defend reasonable positions of their own, and may provide possibilities for changing students' attitudes and behaviour (Gage and Berliner, 1988).

However, Jones (1988) cites a number of problems relating to small-group discussions, as well as whole-class discussions. Firstly, he found that pupils commonly complained that both whole class and small-group discussions were spoiled by individual pupils messing around. They felt that they learnt more in whole-class discussions because the teacher could control behaviour more effectively, although domination of these discussions by a few pupils or by the teacher was then sometimes a problem.

> *"The finding that pupils feel that they learn more in whole-class discussion is partly caused by their worries about control: at least in whole class discussion the teacher is there to try to do something about pupils who spoil things."* (Jones, 1988, p. 71)

Excessive length of discussions and lack of structure, especially in small-group discussions where the teacher's influence was lacking, were also common complaints. Pupils found that, even if they weren't being actively disrupted, small-group discussions often drifted away from the task towards social gossip. Stradling (1985) also reports on a tendency for small-group discussions to end in premature consensus for the sake of completing the task set, often at the expense of a detailed consideration of the issue (Stradling, 1985). In general, although students appreciated having the opportunity to listen to others' views, small-group discussions were not highly valued as a learning experience (Jones, 1988).

In addition to these problems, potential confusion can arise over the interpretation of the term 'discussion' itself. Gayford (1993) notes that he is confining its use to:

> *"... an activity which involves verbal interchange, usually by people acting as equals. This is facilitated by working in small groups without the teacher being directly involved in the discussion ... there should be no hidden agenda in the form of a 'right' answer which was expected from the teacher."* (Gayford, 1993, p. 524)

This type of discussion is very different from the closed class discussion first described by Barnes (1976), and entitled 'pseudo-discussion' by Bridges (1979). Pseudo-discussion involves the teacher asking leading questions in an attempt to elicit a pre-selected answer (Barnes, 1976; Bridges, 1979; Gage and Berliner, 1988). The pupils say little, their contribution being limited to no more than a word or a phrase at a time:

> *"It is the teacher who is using language to shape meanings, not the pupils who are given slots to fill with single words. This is like the kind of traditional written exercise in which pupils are required to copy out a sentence from a book, supplying only single words to fill occasional gaps in the text."* (Barnes, 1976, p. 124)

In this type of discussion the teacher has chosen absolute control over the content and sequence of the lesson. In such a context, pupils' existing knowledge is seen as a threat to the pre-planned sequence of the lesson, and often ignored or downplayed. Consideration of different viewpoints in this kind of discussion is virtually impossible, and Bridges notes that pseudo-discussion is especially unacceptable in areas where opinions rest on problematic value judgements (Bridges, 1979). Nonetheless, Jones (1988) cites evidence which suggests that these types of classroom discussion are much more common than the ideal of open discussion amongst equals advocated above.

A paper by Young suggests that such teaching practices reflect a form of indoctrination whereby the teacher uses various methods to draw the students towards accepting a particular view chosen in advance by the teacher:

> *"The (teacher's) general role ... was one of channelling pupil discourse towards a viewpoint held by the teacher but unstated at the beginning of the lesson ... The direction of the talk over time is dominated by this unstated but implicitly present goal of the lesson to the extent that the lesson may be described as a game of 'guess what the teacher thinks'."* (Young, 1984, p. 230)

The teacher's control is exercised in such a discussion by: explicit control of the topic through a near monopoly of questions; control over students rights to speak; and by

reformulating or summarising student contributions to align them more neatly with the teacher's view (Young, 1984). It would be anticipated that this type of discussion would be less frequent in teaching about explicitly controversial issues, given the concern of most teachers to avoid any potential charge of indoctrination. However, the possibility that some classroom discussion might reflect this pattern cannot be ignored.

Finally, Haydon warns that, even in less controlled contexts, the ideal of reasoned discussion is more difficult to achieve and less commonly realised than might be thought. A so-called discussion might entail no more than an exchange of differing points of view, and may result in conflict and limited tolerance for others' views, becoming a debate where each side attempts to undermine the others' arguments (Haydon, 1997). In Haydon's view, a true discussion should not involve attempting to establish the superiority of one's view, but should involve consideration of the reasons behind those views, and be used as a way of testing those views for consistency. He stresses the implausibility of seeking to discover universal truths through discussion, and suggests instead that discussion participants should seek a compromise position:

> *"Another possibility is that participants in a discussion seek a practical accommodation about what is to be done, while not necessarily trying to persuade each other of the truth of their respective positions ... it requires understanding and articulation of the views of each participant, and the exploration of possibilities and objections."* (Haydon, 1997, p. 144)

By this means, students can be encouraged to develop the important skill of being able to engage in discussion towards a practical solution, rather than the more commonly found bipolar debate. However, the practical difficulties of facilitating this type of discussion in the classroom may be considerable.

ii) Values education strategies

The types of discussion described above do not involve any explicit examination of students' values. Students are encouraged to express their own views and discuss them amongst themselves with the possibility that they may reconsider their position in the light of new evidence and other people's views. However, values education strategies go further than this, encouraging overt examination of the values underlying students' views, and their reasons for holding those views. The teacher in these situations has a much more central role, being engaged in questioning students about the values underlying students' choices or expressions of their opinions (Slater, 1993). A general division can be made between those strategies designed for analysing and clarifying values (of which numbers 1 and 2 below are examples), and those which go further and

prescribe for teachers the role of developing and forming students' values (of which numbers 3 and 4 are examples). There are numerous specific values education strategies which have been described in the literature, of which four of the most common are described below. Although the strategies are discussed separately they can, and often are, used in conjunction with each other.

1. Values clarification

The values clarification approach involves understanding one's own values and deciding on a set of ethical principles to underlie decisions. The approach was developed by Raths *et al* and encourages students to choose their own value positions freely and thoughtfully, committing themselves to that choice and being able to defend it, and taking some action with respect to that choice (Raths et al., 1966, cited in Slater, 1993). The strategy involves the process of valuing, rather than aiming to instil any particular set of values. However, students are encouraged to investigate and understand the basic values which underlie their own views about different issues, through structured written and discussion exercises. These enable them to explore the implications of holding a particular set of values in different contexts, and can help them reconsider their own views (Knapp, 1983; Slater, 1993). Teachers are advised that they should be non-judgmental and not aim to persuade, but instead should challenge students to reconsider what they have chosen, what they value and what they are doing about an issue:

> *"Values clarification avoids moralising or criticism and places responsibility on students to review their ideas, desires and behaviour individually."* (Fien and Slater, 1985, p. 176)

Values clarification has been commonly used because of the wide variety of resources and activities available to teachers (Caduto, 1983; Knapp, 1983; Gayford, 1987). Curriculum materials are easily obtained, and include role plays, games and simulations, out of class activities, and small group discussions. Students are encouraged to spend time before a discussion thinking about their own attitudes towards the issue, facilitated by the production of a list of thought-provoking questions by the teacher. Raths *et al* suggest that the students should provide a written response prior to the discussion, thus enabling their own ideas to be articulated, and increasing the value of the discussion (Raths et al., 1966, cited in Slater, 1993). The advantages of this approach are that the emphasis is on free choice and personal decisions, thereby increasing students' awareness of a range of alternative views, and encouraging controlled discussion, rather than defensive argument. It involves a genuine attempt to get students to listen to others' views with consideration and to think about their own

position, taking into account other possibilities (Gayford, 1987). It can also be a good method for exposing students to inconsistencies between their attitudes and behaviour.

However, values clarification has come under increasing criticism for a number of reasons, primarily for its failure to teach what constitutes value, implicitly suggesting that all views are equally acceptable, or valuing self-interest above all other considerations (Caduto, 1983; Fien and Slater, 1985). It has also been criticised for its weak theoretical basis, since it does not take account of the stage of moral development of the child (see number 3 below), and may be inappropriate with younger children who are not morally autonomous (Caduto, 1983). Practical problems include the tendency for such discussions to involve confrontation rather than clarification. It has been suggested that the oppositional nature of controversial issues makes such confrontation particularly likely (Dewhurst, 1992). Having students state their views in advance of the discussion also brings with it the possibility that students will feel pressured to support their written position, rather than change their minds in the light of the discussion. Research to date has failed to show that values clarification has any influence on students' environmental attitudes (Caduto, 1983). Indeed, Gayford claims that there is little chance of students changing their attitudes, following the use of this strategy, since "the notion that the values of an individual may be inadequate is not even part of the approach" (Gayford, 1987, p. 8). Since there are no general principles to refer to, values clarification offers no rational way of discriminating between different sets of values. In addition, in representing neutrality and tolerance, the teacher may appear to lack personal conviction in his or her own attitudes.

2. Values analysis

Values analysis is another widely used approach which aims to enable students to make reasoned and rational decisions about an issue, and find ways of reaching a compromise between sets of people with different values. It is advocated as a useful strategy for solving problems in the real world, without resorting to relativism:

> *"If geographical education is to foster the decision making skills of students, there is a need for them to be taught strategies for logically examining alternative perspectives on an issue and coming to reasoned decisions."* (Fien and Slater, 1985, p. 177)

Values analysis uses applied rules of logical, scientific thinking to the solution of values dilemmas. Teachers should not promote any values of their own and, "how to evaluate rather than what to value should be stressed" (Watson, 1977). Students are encouraged to clarify the value question, to assemble facts and assess their truth and relevance, and

to find a solution based on the relevant facts (Caduto, 1983; Knapp, 1983; Fien and Slater, 1985). They are not initially asked to state their own position on the issue, but to examine the advantages and disadvantages of different viewpoints, based on their research. Students are encouraged to test the acceptability of their decisions, using techniques such as the New Cases Test, the Role Reversal Test, and the Subsumption Test. The New Cases Test examines consistency by looking at the principles used to support the decision in the light of a different case; the Role Reversal Test asks students to assume the role of someone who is likely to be affected by the decision to see if it is still acceptable; and the Subsumption Test checks whether the decision is the logical corollary of a wider general principle or value and, if so, checks for logical consistency by ensuring that the wider principle also applies to the issue (Fien and Slater, 1985).

Advocates of this method are attracted to its claim of objectivity, and its utility in real life situations given the importance placed in wider society on logical, deductive thinking (Watson, 1977; Caduto, 1983). For example, students must give precise details about how they came to their decisions:

> *"Teachers will need to remind students of the importance of the laws of logic and evidence, challenging them to differentiate fact from opinion, to test and verify factual claims, to make distinctions between relevant and irrelevant data ..."* (Fien & Slater, 1985, p. 178)

By this means, values analysis can encourage logical reasoning about values issues, and help students question their own, and other people's positions. However, its usefulness as a technique of environmental values education has been questioned on the grounds that making decisions concerning values involves different processes from straightforward factual decisions, and it may be that the methods of "investigation, analysis and decision" are inappropriate (Caduto, 1983). Caduto is also critical of the method's devaluation of "emotional and intuitive responses, which could lead learners to think that these aspects are irrational and thus invalid" (Caduto, 1983, p. 16).

3. Moral Reasoning

This strategy is based on Kohlberg's theory of moral development which states that an individual's moral growth occurs in distinct stages. By exposing a student to a problem known as a moral dilemma which involves a level of moral reasoning one step above his/her own, it is possible to stimulate moral growth (Blatt and Kohlberg, 1975; Caduto, 1983; Knapp, 1983; Slater, 1993):

> *"The moral reasoning strategy is based on the premise that individuals move through a number of stages (now questioned) of differing sophistication in moral reasoning, and practice in moral reasoning will lift people to higher levels ..."* (Slater, 1993, p. 140).

Implementation of a moral reasoning approach generally involves both the use of moral dilemmas and extended, intense moral discussion between peers in a classroom setting. The moral dilemma, as developed by Kohlberg, represents an imaginary situation where there is a potential conflict over what is right or wrong. Similar dilemmas can be invented to encourage students to use moral reasoning to solve complex environmental problems. Students are encouraged to state their position (the action they would take in relation to the dilemma), and classroom discussion is directed at examining the reasons for their choices. The type of reasoning used by the students can be interpreted as an indicator of their level of moral reasoning. To get the best result from such approaches, the teacher needs to present the pupils with conflict situations aimed at a slightly higher level or stage of reasoning than their own (Blatt and Kohlberg, 1975).

This strategy has the potential advantage of a strong theoretical background, and Blatt and Kohlberg's work suggests that the use of structured or guided discussion can be a very effective approach:

> *"The limited evidence available ... does suggest that the developmental teaching principles employed in this study lead to more change than is found in either free unstructured discussion of moral dilemmas or in didactic forms of ... moral education."* (Blatt and Kohlberg, 1975, p. 153)

However, the lack of resources available, and the organisational difficulties of such an approach place practical constraints on its use (Caduto, 1983; Fien and Slater, 1985). In addition, there have been a number of criticisms of some of Kohlberg's work and its assumptions of cultural universality as to what represents higher level reasoning (Gilligan, 1982; Kitwood, 1984; Portele, 1985). In particular, teachers would be well advised to tread cautiously in interpreting students' discussions about controversial issues as indicative of differing levels of moral reasoning in the light of Gilligan's critique which suggested that there might be qualitative differences between men's and women's responses to moral dilemmas which could not be reduced to differing levels of attainment:

> *"The disparity between women's experience and the representation of human development, noted throughout the psychological literature, has generally been seen to signify a problem in women's development. Instead, the failure of women to fit existing models of human growth may point to a problem in the representation ..."* (Gilligan, 1982, p. 2)

However, the moral dilemma can still provide a useful tool in some situations, provided teachers are careful not to use it as a method of evaluating or labelling students.

4. Inculcation

Inculcation is a process in which students are encouraged to accept particular values for reasons of authority or tradition (Knapp, 1983). This approach focuses on methods such as moralising (simply saying what is right), modelling (setting a personal example), and behaviour modification by positive and negative reinforcement (rewarding or punishing behaviour). It is a strategy commonly used both with young children, and to enforce agreed rules within school or to instil attitudes towards racial equality. It is generally justified on the basis that values are inculcated whether intentionally or not, and that there are certain values in society which must be passed on to the next generation (Caduto, 1983). In the context of racism, Singh argues that young children learn a great deal from imitating others, therefore the teacher should at least provide a good example of desirable behaviour (Singh, 1989). Caduto cites evidence from 'ecology camps' which suggests that behaviour modelling can also be effective in influencing young people's environmental attitudes (Caduto, 1983).

Inculcation of environmental values is generally recommended as an appropriate strategy in the education of younger pupils who are not morally autonomous; with older students the emphasis should be on increasing awareness of their own values and how these relate to wider society (Caduto, 1983). The threat of indoctrination, according to advocates, is only a problem "when youngsters are psychologically mature enough to make their own decisions" (Hall and Davis, 1975, cited in Caduto, 1983). Because younger pupils have not yet developed higher stage moral reasoning or a personal value system, this stage of teaching should, according to Caduto, consist of:

> *"Inculcating sound social and environmental values as part of the general moral education of the individual ... Developing within the individual an ethical system that is based on seeking the greatest good and distributing that good justly among the human and environmental elements ... Fostering each individual's ability to function at higher levels of moral reasoning."* (Caduto, 1983, p. 15)

However, he also warns that vigilance is needed to prevent teachers from presenting personal bias and prejudice under the pretence of teaching ideal social and environmental values.

Many educators are extremely wary of inculcation, considering that values are too subjective to be taught, and fearing indoctrination of the school or teacher's values. Others believe that the appropriate site for values inculcation is the home or church (Caduto, 1983). Limitations of the approach may also arise if - as is highly likely - the individual teacher does not show complete consistency of values and behaviours, thereby providing a confused message for the children (Knapp, 1983). In addition, such a behaviourist approach does not develop the critical thinking skills of pupils and is likely to fail to provide them with the requisite skills to analyse environmental problems and decide on appropriate action in the long term. There is also some evidence that such attempts at inculcation of desirable attitudes in school (as in anti-drinking or anti-smoking campaigns) are ineffective even at changing short term behaviour (Fien, 1993).

2.5 Conclusions and Research Questions

It is clear that during the evolution of environmental education, there has been an increasing concern with environmental attitudes, a concern which can be charted through the development of policies at an international and national level, and also through the views of teachers and students. Underpinning this development is a change in philosophical position, which has moved from support for the traditional 'education about the environment' towards the more radical 'education for the environment'. Some potential problems with the increasing focus on environmental attitudes and behaviours have been pointed out by a number of observers concerned about indoctrination, especially given the asymmetry of power which exists in the classroom situation. Moreover, the apparent conflict between traditional educational thought and the direction of the environmental movement has led to conflicting advice for teachers in the form of the twin aims of promoting attitudes and encouraging independent thought. Where environmental attitudes are not agreed upon in the wider population, the decision to promote selected attitudes or values is problematic for teacher and students alike. However, even those people most strongly opposed to the current direction in environmental education do not appear to consider the threat of indoctrination to be a serious problem, believing that attempts to indoctrinate children are doomed to failure. Also, whilst some environmental education does no doubt reflect somewhat uncritically the wider environmental discourse, the extent of this problem can easily be exaggerated.

However, further problems arise when the meaning of environmental attitude is considered and revealed as a fundamentally ambiguous concept, thereby enabling the co-existence of widely differing interpretations of the stated aims of environmental education. The literature reveals considerable confusion and controversy about the exact meaning of 'attitude', and the term 'environmental attitude' has rarely been defined despite its common usage in environmental education. An analysis of the environmental attitudes and values promoted by different documents suggests that superficial agreement on the aims of environmental education may disguise distinct differences in meaning and intent. The attitude concept itself is also problematic in its suggestion of an internal psychological structure which is viewed as invariable, its link with attitude measurement scales, and its uncertain effect on behaviour. Using a qualitative approach in this study enables a consideration of environmental issues which involve attitudes, but does not necessitate the uncritical acceptance of the concept or the use of attitude scales.

The advice being offered to teachers from the academic community about the ways in which controversial issues should be taught presents teachers with difficult decisions in selecting appropriate classroom roles and strategies. The aim is to teach about these complex issues in a way which is understandable to the students but does not lead to excessive simplification. In the reality of the classroom, this will be a substantial challenge for teachers already struggling with overloaded syllabuses and increasing administrative responsibilities. It appears that to teach controversial environmental issues effectively, extremely high quality teaching skills are required: teachers need good organisational abilities to manage the requirements of different classes or issues, and to gather an appropriate variety of materials; they require good interpersonal skills to create an atmosphere where values can be discussed openly; conflict resolution skills to try and encourage empathy and co-operation, and prevent deterioration of discussion into polarisation or conflict; and intellectual abilities to enable them to follow the complexities of different arguments and tie them together in an understandable way, without imposing their own interpretation on the students. Moreover, constraints outside the teachers' control may reduce the possibilities for such issues being addressed in depth in schools.

There is little consensus in the literature about the most appropriate role for the teacher, or the most effective teaching strategy, therefore it provides limited guidance for teachers dealing with controversial environmental issues. As the review suggests, none of the approaches is problem-free, and each of the strategies has its own particular strengths and weaknesses. However, an increased awareness of these strengths and weaknesses is an important step towards making the decision about an appropriate

strategy in any set of particular circumstances. Each of the strategies discussed has elements which teachers may wish to utilise in their own teaching, but these may vary depending upon specific classroom circumstances including: the prior knowledge, values and experiences of the students; the age and ability of the students (and their potential for moral autonomy); the teaching methods which are common in other lessons; the classroom climate (i.e. the extent to which pupils feel free to express a point of view and comment critically on the views of others, especially the teacher); the reactions of pupils to the lesson content and teaching methods (e.g. apathy, unquestioning consensus, polarisation of opinions, expressions of extreme prejudice etc.) Of central importance is the relationship the teacher has with the students, and his/ her ability to create the right climate for discussion in their classroom.

Given the potential ambiguities in the literature, it is clear that teachers' own pedagogical and environmental beliefs may play an important role in guiding their teaching about controversial environmental issues. However, most previous research in environmental education has involved large scale surveys of students, or classroom interventions, revealing little about teachers' beliefs and normal classroom behaviours. (Rickinson, 1999, is a recent exception). Moreover, much of the literature appears to ignore the potential problems which may arise through the classroom enactment of prescriptions about teaching environmental issues. Therefore a need is identified for research which will provide a detailed account of teachers' beliefs and classroom practices, amassing extensive data and providing a clearer explanation of the relationship between beliefs and actions. The aims of this study are to examine the beliefs and aims of three experienced teachers, and the ways in which they approach teaching about controversial environmental issues, taking into account the realities of the classroom and the practical constraints under which they work. To guide the empirical part of the study, the following research questions were utilised:

- What are the teachers' beliefs and aims regarding teaching controversial environmental issues in Schools' Council 16-19 A level geography?

- In what ways and to what extent are these beliefs and aims enacted in the teachers' classroom practices?

- What are the problems and possibilities with teaching controversial environmental issues?

Answers to these three questions are considered in chapters 5-7 respectively.

Chapter 3
Methodology 1: Data Collection

3.1 Introduction and overview of methodology

In the light of the literature reviewed in the previous chapter, a need was identified to investigate current practices regarding the teaching of controversial environmental issues. Accordingly, the development of an appropriate methodology was required in order to explore the specific research questions arising from this review (see section 2.5). The overall purpose of the research was to develop an understanding of the possibilities and problems of teaching controversial environmental issues, through studying in depth the beliefs and practices of three experienced geography teachers teaching 16-19 A level geography. This course was selected because of its strong focus on environmental topics (particularly the more controversial aspects), in the hope that it would provide plentiful opportunities for observing such issues being taught. A non-interventionist approach was preferred, since the research aim was to focus on current practice rather than on a limiting view of 'ideal' practice, therefore it was necessary to find classrooms where controversial environmental issues were already being taught.

The methodology utilised was influenced to a large extent by insights gained from the work of Brown and McIntyre (1993) and Cooper and McIntyre (1996), in their work on effective teaching and learning. These authors asserted that:

> *"... any understanding of teaching will be severely limited unless it incorporates an understanding of how teachers themselves make sense of what they do: how they construe and evaluate their own teaching, how they make judgements, and why, in their own understanding, they choose to act in particular ways in specific circumstances to achieve their successes"* (Brown and McIntyre, 1993, p. 1)

Cooper and McIntyre also recognised that:

> *"... pupils' perceptions of classroom reality were an essential adjunct to teachers' perceptions, if they were to create a fully rounded picture of the lived reality of the classroom."* (Cooper and McIntytre, 1996, p. 25)

This study brings together these two accounts and analyses them, alongside classroom practices, to provide insights into the problems and possibilities of teaching controversial environmental issues.

Taking into account the time needed to acquire an in-depth understanding of another person's perspective, and the exploratory nature of this study, a case study design was chosen as the most appropriate research strategy. Large scale survey methods were considered too restrictive to enable an adequate in-depth understanding, and would suffer from the same problems identified in earlier studies (see Robottom and Hart, 1993). The use of case study is understood here to mean:

> *"... a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence"* (Robson, 1993, p. 5).

In this study, the phenomenon being investigated was the teaching of controversial environmental issues, and the multiple sources of evidence utilised included lesson transcripts, fieldnotes and teacher and student interviews.

Stake describes two different types of case studies, 'intrinsic' and 'instrumental' (Stake, 1995), of which this study is seen as instrumental in aim. 'Instrumental' case study is described as that which, "... is instrumental to accomplishing something other than understanding this particular teacher" (Stake, 1995, p. 3). A major distinction between instrumental and intrinsic case studies is whether their primary concern is with the unique aspects of the case or with the commonalities between different cases. Each case (whether an individual, class or institution) will have both similarities to, and differences from, other cases and it is the researcher's focus which distinguishes one type of case study from another. In this study, the primary focus is on teaching controversial environmental issues, and the individual cases (each teacher and her A level geography class) are seen as examples which will illustrate issues related to this focus. Some similarities were anticipated between the three cases and therefore, whilst each case was treated individually, the end goal of the analysis was a cross-case comparison to draw out those commonalities. The research therefore utilised a multi-site instrumental case study approach, involving the study of three different cases, each illustrating the research focus (of teaching controversial environmental issues) in a different school. The three cases were studied sequentially over the course of 2 years, and involved spending a total of 5-6 weeks at each site.[1]

A major advantage of the case study approach is its strong grounding in reality. Stenhouse describes case study research as being more accessible to teachers, due to its

[1] It should be noted that whilst being technically 'case teachers', for ease of reading, the teachers are referred to in the thesis as 'case study teachers'.

focus on specific concrete situations (Stenhouse, 1985). This study was considered more likely to prove useful to teachers if they were able to relate it easily to their everyday experience. A further advantage of case study is the rich detail generated, which allows, "attention to the subtlety and complexity of a case" (Adelman et al., 1980), detail which might be overlooked in a larger-scale study. However, case study research does raise problems concerning generalisability: Although statistical generalisation was not intended, the aim of the research was to provide insights of wider applicability from the study of three specific cases. Generalisation, in this study, takes the form of 'theoretical inference' (Hammersley, 1998), in which the conclusions move beyond the claims made about the individual cases to a more general, theoretical level which is potentially of wider interest. Descriptions of the individual cases in this study are therefore used to theorise about the possibilities and problems of teaching controversial environmental issues in contemporary schooling. Any theoretical understanding thus produced should be considered provisional in nature and would benefit from further investigation. However, the current lack of research in this area gives this project value as an exploratory study[2].

Within the case study approach, a variety of research methods could have been utilised. A pilot study was undertaken in order to aid the development of appropriate methods with which to gain access to the teachers' beliefs and practices. The paucity of previous research in this field meant that there was no obvious template to follow, therefore a variety of methods were tested in advance of the main fieldwork phase. Most previous research relating to the value-laden aspects of environmental education has involved the use of questionnaires which purport to measure attitudes, research which has been largely inconclusive (see Chapter 2). In addition, much of the writing on environmental education has tended to be *prescriptive*, with authors stating what *should* be done, rather than starting with what is actually happening, according to the people involved. Whilst it would have been possible to utilise quantitative as well as qualitative measures within the case study approach, the desire to base the analysis on participants' perspectives suggested that a qualitative approach would be the most appropriate. Moreover, the trial use of a questionnaire in the pilot study was found to be of limited benefit, thus entirely qualitative methods were used in the main study. This chapter describes the principles and procedures utilised in designing the research strategy and those which guided the collection of data. It also explains the rationale behind the choice of methods, including insights from the pilot study where appropriate.

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[2] Potential issues relating to generalisation are discussed further in the final chapter.

3.2 Guiding Principles

The methodological task was to collect data which would provide evidence about the teachers' beliefs concerning teaching controversial environmental issues, and the ways and extent to which these beliefs were enacted in classroom practices, utilising the perspectives of both the teacher and the students. Two key principles guided the choice of methods for this data collection:

Principle 1:

A central aim of the inquiry is to study events as they happen, in the reality of the classroom, without interference from the researcher.

Unlike much previous research, this case study aimed to reduce to a minimum disturbances to the everyday events in the classroom. Thus experimental conditions were not created by the researcher: on the contrary, teachers were requested not to change their teaching in any way. In addition, a number of steps were taken to try and reduce the possibility of the teacher or students being influenced by the presence of a researcher. These included the use of a two-week 'lead in' observation period prior to the start of fieldwork proper; the use of non-participant observation, whereby the aim was to be as inconspicuous as possible in the classroom; and the development of good relationships with both teacher and students to reduce the potential stress of being observed. A further step entailed withholding certain information about the study from participants to reduce reactivity to the research agenda, a procedure which is discussed further in section 3.6.3 with respect to the ethical issues involved.

Principle 2:

The intention of the data collection is to gain an understanding of the meaning of events from the point of view of the participants rather than to judge from an external point of view.

For this reason, no *a priori* scheme was used to categorise teachers' and students' classroom behaviours, and interview questions and techniques were deliberately directed towards accessing teachers' and students' authentic accounts of their thinking. It was considered particularly important that the lessons should be understood in terms of the teachers' aims, rather than any pre-conceived ideas about how the topic *should* be taught, especially in the light of the literature which contains so many prescriptions about what

teachers should be aiming for in their teaching about environmental issues, and the lack of empirical research which looks at the realities of such teaching. In addition, the students' views of the lesson were seen as an essential adjunct to the teacher's view, and provided a possible means of taking the analysis of lesson events beyond a description of the teacher's thinking, and closer to an understanding of the possibilities and problems of teaching controversial environmental issues. Research relationships were of crucial importance in the operationalisation of this principle to encourage openness and honesty from research participants, and these are discussed further in section 3.6.

3.3 Sampling and Access

Of necessity, the study was small scale. The aim of accessing authentic accounts from teachers and students entailed a considerable expenditure of time at each site, developing research relationships and undertaking the data collection. Clearly, it would have been possible to focus solely on one teacher, thereby enabling the researcher to spend a longer time period in the school. However, in the light of the substantial pressures which teachers are under, this was felt to represent too much work for any one teacher, given the demands of the data collection (recording every lesson with the selected class, interviewing the teacher briefly before and after each lesson, and carrying out an extended interview once a week). Moreover, the benefits of studying more than one teacher (in terms of having greater confidence in the theoretical conclusions which could be drawn through cross-case comparison) were felt to outweigh the disadvantages of having less time available. The best compromise between the number of cases which could be studied, and the length of time spent on each, was felt to lie in three cases. This provided the possibility of cross-case comparison, whilst at the same time allowing data collection and analysis to remain a practical undertaking. In addition to the three cases studied, a pilot study was conducted with the aim of testing potential methods and gaining experience in the conduct of educational research so that valuable time was not wasted in the main fieldwork phase. No analysis of the substantive data collected in the pilot study is included in the thesis, though methodological insights gained are discussed where appropriate.

In the main fieldwork phase, each case involved the selection of a teacher with whom to undertake the research, and the selection of four students from within the A level class with whom to conduct interviews. The rationale for each of these selections is discussed below in 3.3.1 and 3.3.2. Initial access to the classes was negotiated with the teacher. Access was facilitated via telephone contact, followed by a visit in which the aims and methods of the research were explained and discussed. The amount of information provided to the teacher was increased in each case, prompted by concerns

raised by the teachers. An initial code of conduct and information sheet was expanded to include a statement on ethical issues following a concern raised about confidentiality (see Appendices A1.1 and 1.2). Although the researcher aimed to provide as much information as possible to both teacher and students, it was made clear that, as a qualitative study, the focus of the research might change and develop over time. Access to the students was made via the teacher, the problems of which are discussed in section 3.6.1.

3.3.1 Selection of teachers

The guiding principles behind the selection of teachers were that they should be:

a) Teaching a suitable environmental module in the 16-19 A level course;
b) Experienced teachers (not students or newly qualified teachers);
c) Interested in being involved in the research.

In addition, considerations such as ease of access, travel costs and the desire to obtain a sample containing teachers of each gender and differing school types were taken into consideration in the final decision. This was not a random sample, but one designed to maximise the, "opportunity to learn" about teaching of controversial environmental issues (Stake, 1995, p. 6). Because of the desire to undertake a naturalistic inquiry, it was essential that the teachers observed should already be teaching controversial environmental issues, hence the focus on specific parts of the 16-19 geography course. In addition, in line with the aim of learning from the teachers' experience of teaching these issues, it was felt that experienced teachers would provide a richer depth of practice to draw on. Finally, because of the requirements of the research in terms of time and effort, it was essential that the teachers were genuinely interested in the research and being involved. Table 3.3 below describes the different schools and teachers which were selected for the final case studies.

Table 3.3:

	Teacher 1: Mary	Teacher 2: Sam	Teacher 3: Chris
Position in school:	Head of Geography	Geography teacher	Geography teacher
Years teaching:	24	4	25
School size:	2000	1000	1000
School situation:	Rural	Urban	Rural
Year group studied:	12	13	12
Topic studied:	Ecosystems (Rainforests)	Wilderness regions	Ecosystems (National Parks)

3.3.2 Selection of students

The decision to interview a small number of students in the main study (in the pilot study all class members had been interviewed) was taken to increase the depth and number of interviews possible. It also enabled interviews to be undertaken during the observation period, rather than at the end. However, this decision raised a number of questions such as:

- How many students should be interviewed?
- Should they be interviewed singly or in pairs?
- How should these students be selected from the class?

The initial plan was to focus on two pairs of students, but this was considered too small a sample to allow for possible attrition due to absence or withdrawal from the study. Using three pairs of students, however, provided a potential ethical problem in small classes, where only a few students would be excluded. Therefore, the final decision was to select four students and interview them individually, a strategy which had the added benefit of enabling the discussion to encompass individual comments in lessons. However, a further issue of student preference was also taken into consideration, leading to a paired interview in case study 1 at the students' request. In this case, it was considered of primary importance that the students should feel comfortable with the situation and free to express their own views.

Choosing students from within the class also raised a number of issues. The aim was to interview a variety of different students, and investigate their responses to different teaching practices. The selection of students, therefore, attempted to avoid focusing solely on the higher ability or more articulate students, or those who were most outspoken in class. However, prior experience in the pilot study had demonstrated how difficult interviewing quiet students could be! Whilst the aim was again to draw on a sample which maximised the 'opportunity to learn', the factors which might be important were less clear. Frequently, one or two students stood out as potential interviewees because of comments they had made during lessons. In addition, an attempt was made to include at least one less talkative student, since the pilot study had indicated that some interesting issues could be aired by those class members who were not forthcoming in lessons. Gender was another potentially important issue, since the literature suggests that girls may view environmental issues differently from boys (and interact in lessons differently), so the aim was to achieve a 50:50 mix of boys and girls (this generally reflected the mixture in the class as a whole). The pilot study had suggested that ethnic origin could be important, but the racial homogeneity of the classes in the main study meant that this could not be investigated. Finally, the aim was to select students from across the ability range (as judged by the teacher) to avoid a high ability bias. The selection of students was made, in conjunction with the teacher, during the lead-in observation period.

3.4 Data collection schedule

Table 3.4 (below) gives an overview of the data collection schedule[3], and rationale. Three weeks was chosen as a suitable time period for each case, in order to allow sufficient time to interview students and teachers, and to produce a manageable amount of data. The pilot study had been slightly longer but the volume of data produced proved very difficult to manage. In the light of the pilot study experience, five weeks (including the lead-in period) was considered to be the minimum time required in which to develop good relationships with research participants and provide opportunities to observe a range of teaching. In addition, it was thought that an extended period in school increased the likelihood of gaining access to, "crucial revelations" emerging from, ".. chance incidents, extended comments and both informal and formal gatherings" (Bryman and Burgess, 1994). The necessity for a two week lead-in period became clear in the pilot study, since there was evidence that the students were more

[3] NB In case study 3, one interview of 40 minutes duration was conducted with each of the students at the end of the case study, covering all lessons observed, and two interviews of approximately 1 hour each were conducted with the teacher during the last two weeks of the case study.

conscious of the tape earlier on in the study, and became noticeably more relaxed as the fieldwork proceeded. Since the interviews were designed to be undertaken during the main fieldwork period, it also seemed advisable to become acquainted with the students and teacher before this period started.

Table 3.4

Time	Event	Rationale
Week 1	- Observing and recording all lessons (approximately 1 hour each).	- Familiarisation period: The need for this was identified in the pilot study.
Week 2	- Observing and recording all lessons. - Choosing case study students.	- Familiarisation period: To reduce reactivity and get to know the students.
Week 3	- Observing and recording all lessons. - Interviewing 4 students for 20 minutes - Interviewing teacher for 30-40 minutes	- To provide a shared basis for interviews - To provide a student account of lessons - To provide teacher's account of lessons
Week 4	- Observing and recording all lessons. - Interviewing 4 students for 20 minutes - Interviewing teacher for 30-40 minutes	- Rationale as above.) - Research focus becoming) more explicit.
Week 5	- Observing and recording all lessons. - Interviewing 4 students for 20-30 minutes - Interviewing teacher for 40-50 minutes	- Rationale as above) - Interviews include more) general topics and explicitly) refer to attitudes and values.

In addition to these formal data collection methods, fieldnotes referring to informal conversations with teachers and students were also taken and a research log containing current concerns, insights and reflections was kept throughout the fieldwork period.

3.5 Data Collection Procedures

3.5.1 Non-participant classroom observation

Observation, in the context of this study, was viewed as providing an essential reference point with which to compare the data obtained though interviews. A major aim of combining interviews with observation was to provide a background of shared experiences, and to enable specific incidents within lessons to be discussed with both the teacher and students. As Brown and McIntyre (1993) point out, this constrains respondents to, "concentrate on real and shared events rather than imagined reconstructions" and provides, "means for a limited check ... on the teachers' accounts of what had happened" (p. 36). In addition, the classroom observations in this study

served another purpose - that of providing supplementary data on the teaching strategies selected by the teacher, and the teachers' and students' contributions to classroom discussions. This corresponds to Menzel's request for an outside observer's account of a social episode, *alongside* the explanations that participants themselves give (Menzel, 1978), to provide a deeper understanding of the situation.

Since the main purpose of the observation was to provide a point of reference for interviews, a set of standard, systematic measurements was deemed unnecessary and inappropriate. Thus unstructured rather than systematic observation was used, and lessons were recorded using a lapel radio-microphone worn by the teacher. Notes were also taken during the class including: A brief summary of events through time to enable a temporal dimension to be included in the transcripts; copies of any writing or diagrams made on the blackboard; occasional comments on the actions of teacher or case study students where these would not be clear on the tape; and any interpretative ideas occurring during observation. (These interpretive notes and comments were kept separate from the actual transcript of the lesson). In addition, student contributions to whole class discussions (which were often picked up poorly on the radio microphone) were transcribed by hand in as much detail as possible, noting the name of the student involved. This enabled post-lesson interviews with the students to include questions about specific comments they had made in class. Other details that would not appear on the tape, such as the seating of students and the layout of the classroom, were also noted.

The importance of having a transcript of the lesson alongside interview data can be clearly demonstrated by considering an incident which occurred in case study 1. The lesson had included a heated debate between the teacher and some of the students about the land rights of indigenous people. Even with the use of stimulus material in the interviews (an extract from the tape for the teacher, and from the transcript for the students), participants' recollections of the events were very different, each tending to cast themself in a better light (see figure 3.5.1 overleaf):

Figure 3.5.1

Lesson transcript:
T: Well they call it the Maring forest because it belongs to the Maring, yeah.
Sarah: It doesn't belong to them, they just live there
T: Ah well that could open up all sorts of debates, Sarah, couldn't it? If it doesn't belong to them, to whom does it belong? Or does that mean that indigenous people ...
Sarah: It doesn't have to belong to anybody, they just use it.
Pupils: (Other responses inaudible)
T: And does that mean .. does that mean that indigenous peoples have no land rights?
Sarah: No
[CS1 Extract 1, lines 18-25. See appendix A3.1]

Teacher's recollection:
T: Oh it's because that was where Michael had mis-read the Maring's forest, and she [Sarah] said, 'is it their forest?', and I sort of pointed out that it was their forest, she says 'no it isn't their forest', and then she said 'but they're only natives, they're only ..' that was right, she said 'they're only natives', you know. How do they have a right to it? She immediately questioned was it really their forest, did they have any rights of ownership .. (CS1 T1: 110-15)

Student's recollection:
Sarah: I think it was something like .. I don't know, didn't I say that they don't own the land or something? I said that they don't actually own the land, you know, they don't have a bit of paper or whatever, and she said 'Well that doesn't mean that they're not intelligent or something' and we all went 'What? I wasn't saying that!' It was quite funny. (CS1 SA1: 20-24)

With such differing accounts regarding apparently straightforward recollections of what was said, it was extremely useful to be able to return to the original tape or transcript for clarification.

The researcher's role in the classroom could most easily be described as a non-participant observer in a naturalistic setting. The aim was to be present in the class but to be unobtrusive, avoiding communication with either teacher or students during the lesson. Although speaking to the teachers about their thoughts during the lesson could potentially have been useful, it was deemed that the danger of being perceived by the students as part of the teaching staff outweighed any possible advantage. For this reason, stringent efforts were also made to avoid involvement in any teaching aspect of the lessons. However, the role of non-participant was somewhat flexible with respect to communicating occasionally with students during lessons (especially during the familiarisation period), since the pilot study had demonstrated that this could aid the formation of good research relationships prior to interviews. In addition, a brief talk was given to the students during the lead-in period explaining the nature of the research and inviting comments or questions. This aimed to pre-empt any possible concerns about the purpose of the lesson taping, and to avoid the teacher being forced to answer the kind of queries which arose in the pilot study (such as, "Why are you wearing that microphone, sir? Is it a Walkman?"). Other than this initial interest in the research equipment, there were few occasions when there was evidence that students were

particularly conscious of the researcher's presence, and the lead-in period of two weeks was introduced to limit the researcher's influence still further.

Another issue which arose from the use of unstructured observation in the pilot study was the production of an overwhelmingly large amount of data. The complexity of the classroom situation has led to the development of numerous observation systems which aim to simplify it. Eschewing structured observations, and choosing to transcribe lessons in their entirety in the pilot study led to the collection of enormous quantities of data and placed major limitations on the time available for reflection and analysis of the data during the study. This meant that potentially important interview questions were left unasked due to insufficient time spent reviewing lesson data. It was therefore concluded that whilst a full tape-recording of all lessons was valuable (including those lessons in which the teacher states that 'nothing interesting will happen'!), the utility of having complete lesson transcripts was outweighed by the time taken to produce them. Thus, in the main study, the tapes of lessons were indexed rather than transcribed fully. The index contained a summary of events together with references to tape sections using a counter, so that these could be quickly and easily reviewed if necessary [4]. The tape was transcribed fully only in those sections which were incorporated into teacher or student interviews (the rationale for inclusion in interviews is described in section 3.5.2). This allowed more time to undertake provisional data analysis and production of interview schedules between one week and the next, and made the volume of data more manageable.

3.5.2 Semi-structured interviews with teacher

One of the central aims of the study was to access the teachers' beliefs about teaching controversial environmental issues in geography, on both a general and a specific level. An interview framework was needed, therefore, which would enable the research agenda to be covered, but would also be flexible enough to allow in-depth probing and to allow the interviewee to be expansive and to lead the interview to a certain extent. In order to achieve this, a method of 'informant' style interviewing (Powney and Watts, 1987) was adopted. Informant interviews permit the gathering of a very rich data set, they allow the respondent to explain, justify or qualify their views, and they allow digressions from the set agenda if issues of interest arise [5]. The exploratory nature of this study and the desire to elicit a deeper understanding of the thinking that guides action in real teaching situations indicated a need for in-depth information from a small number of teachers.

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[4] See appendix A1.3 for an example.
[5] See appendix A1.4 for examples.

In the first two case studies, three formal interviews were carried out with each teacher, as well as a number of informal conversations before and after lessons. In the third case study, only two interviews were undertaken, in the belief that the research focus was more finely tuned by this stage (2 years after the pilot study), and that the researcher was more experienced and therefore able to collect the data in a more limited time period. It also reflected the practicalities of gaining access to a school in which to undertake the final case study. The length of each interview was expanded so that the reduction in overall time available was minimal. Informal pre- and post-lesson comments were elicited from the teachers in all cases to discuss their plans for a forthcoming lesson or to note points of interest about the previous lesson. These conversations helped to structure the more formal interviews by taking account of those aspects of the lesson which interested the teacher. However, due to the teachers' full timetables, it was frequently difficult to arrange to speak with the teacher immediately before and after lessons, therefore some flexibility was required.

The first two interviews (the first one only in the third case study) were based around the preceding lessons, and aimed to investigate issues such as: The teacher's aims for the lessons; the rationale behind choice of topic or case study; the rationale behind choice of resources and teaching strategies; and the teacher's role in the lessons. The interview schedules consisted of a mixture of general questions, such as, 'What did you want the students to achieve in these lessons?' and questions that were based around more specific events that had occurred in the lessons (using stimulated recall of sections of the tape - see below). The rationale for selecting parts of the lesson to discuss in the interviews was based on the teacher's post lesson comments (when available), and a preliminary analysis of the data in relation to the research focus. Extracts were chosen for inclusion if:

- The teacher had commented on them before or after the lesson;
- The teacher had been explicitly talking about attitudes, values, opinions or viewpoints in the lesson;
- Statements made in the lesson appeared to fit into one of the three categories of attitude mentioned in the syllabus ("an attitude of concern for the quality of environments (1), for the condition of human life (2) and for the biosphere as a life support system (3).")

Although the choice for inclusion was often based on the researcher's interpretation of the extracts, they were not labelled as being particularly controversial, and open ended questions, such as 'Can you say a bit more about what was going on here?' were asked, leaving the teachers to interpret extracts in their own way.

By grounding interviews in shared classroom events, it was hoped that the discussion would focus upon the reality of teaching about controversial environmental issues rather than upon an ideal view held by the teacher. This relates to Argyris and Schön's distinction between 'theory-in-use', that is theory that actually governs an individual's actions, and 'espoused theory', which is how an individual *thinks* he might act in such a situation (Argyris and Schön, 1974). The aim was to access the former kind of theory by focusing on shared concrete events which had been observed by the researcher. The majority of the interviews therefore focused very explicitly on classroom events which had previously been observed. However, the final interview covered a wider variety of subjects, including explicit discussion about the research focus - teaching controversial environmental issues. Incorporated into this interview were questions about the teachers' aims and strategies for teaching controversial environmental issues. The aim of this interview was to provide a broader view of the teachers' beliefs about teaching controversial environmental issues, in contrast to the more specific instances discussed with stimulated recall. The interview schedule was therefore based partly on ideas gained from the literature, and partly grounded in the series of lessons observed.

The potential benefits of using stimulated recall to encourage recollection of lesson events are open to controversy. The technique, developed by Bloom, aims to aid recall of original events and authentic thoughts:

> *"The basic idea underlying the method of stimulated recall is that a subject may be enabled to relive an original situation with vividness and accuracy if he (sic) is presented with a large number of the cues or stimuli which occurred during the original situation."* (Bloom, 1953)

The main advantage of stimulated recall is the focus on shared experiences and the ability to connect interview comments with specific classroom events. Moreover, recall of events has been found to be much greater when the prompting of a tape is used, and the use of audiotape rather than video has been found to be less stressful for the teacher (Calderhead, 1981). However, the extract illustrated in figure 3.5.1 demonstrates the limitations of such recall, even with the use of a stimulus, and apparently reflects the difficulty of preventing respondents distorting their recall of thoughts (intentionally or unintentionally) in order to present themselves more favourably. In addition, arguments abound as to the extent to which the teachers' comments can be said to articulate their interactive thinking rather than reflecting *post hoc* rationalisation (giving plausible rather than authentic explanations) after the event.

Calderhead argues that much of a teacher's knowledge is *tacit* (developed through experience and having never been verbalised) or automatic (the behaviour is engaged in unthinkingly), and may not be communicable in verbal form (Calderhead, 1981). In addition, there is evidence that teachers may become gradually aware of the research aims during the period of study (especially in the light of interview questions), and may structure their answers so as to comply more fully with these aims. The dilemma for the researcher is that teachers find it, "much easier to talk about thought processes if they know on which type of thoughts to focus their attention"; however, the focus provided must not distort or invalidate the evidence (Calderhead, 1981). In an attempt to resolve this dilemma, open questions were used wherever possible, and the teachers' initial responses or post lesson comments were used as a springboard for further probing. In addition, suggestions provided by Cooper and McIntyre (1996) for increasing the validity of responses were followed. These included: Interviewing teachers and pupils as soon as possible after the lesson; focusing on shared experiences; asking open-ended questions (an attempt to minimise researcher bias); and attempting to create a non-judgmental atmosphere.

The arguments over the extent to which stimulated recall can prompt teachers to recall their actual interactive thoughts are more complex. Yinger suggests that thoughts and recall of events are rapidly lost from short term memory and are extremely hard to access (Yinger, 1986). He argues that when videotape is used for stimulation, teachers will explicate their thinking in relation to the video rather than the original event. This problem is thought to be less acute with the use of audiotape, which represents a less alien stimulus. Nonetheless, the extent to which the teacher is responding to the stimulus rather than to their recall of the event is impossible to judge. Yinger states:

> *"There is a luxury of meta-analysis and reflection that was most likely absent in the original event. The result of this opportunity for reflection is that subjects report what they are currently thinking and take the opportunity to elaborate the reasons for their interpretation."* (Yinger, 1986, p. 271)

However, since the purpose of the interviews in this study was to understand the teachers' beliefs and aims which guided their teaching about controversial environmental issues, the need to access interactive thoughts was not considered crucial. The aim of using stimulated recall was to direct the teachers to certain parts of the lessons and to access their understandings of these events, but whether the thoughts thereby accessed are genuine interactive thoughts or *post hoc* interpretations of their actions is less important than that the teachers make a genuine attempt to understand what was happening. Cooper (1993) suggests that some, if not most, interview data will be in the

form of *post hoc* rationalisations, but that these are nonetheless valuable in providing a description of how, as a rule, the interviewee normally thinks and behaves (p. 336).

All interviews were recorded and transcribed in full in order that as full a record as possible was available with which to substantiate later claims. Taping was considered less intrusive than taking notes - a view echoed by Hammersley and Atkinson (1995) who suggest that taping reduces 'reactivity'. However, there were occasions when the informal nature of discussions with the teacher mitigated against turning on the tape recorder. In these instances, any discussion about areas of interest was noted down or tape-recorded as a memo as soon as possible after the event. Clearly, this provided a less full and reliable account of what was said, but the data obtained in this way was considered to add valuable information to that gained through formal interviews. All extracts from taped interviews are quoted verbatim. Extracts from un-taped discussions are quoted from notes taken at the time or immediately afterwards - the nature of the data is always cited.

In the original transcripts, an attempt was made to record all pauses, repetitions or 'filler' words or phrases ('you know', 'in a sense', 'like', 'um', 'err' etc.). Short pauses (under 3 seconds) were noted by .. , longer pauses (over 3 seconds) were noted as .. 4 .. with the number indicating the number of seconds. However, for quotation in the thesis, transcripts have been edited slightly to remove such notations and make other small changes for ease of reading, where this was possible without altering the meaning of the participants' comments. On the rare occasions where it was impossible to make out what was being said, the notation '(unclear)' has been inserted into the text. In almost every case, this was just one or two words which were incomprehensible even after multiple replaying.

3.5.3 Semi-structured individual and group interviews with students

The aim of the student interviews was to gain access to students' experiences of learning about controversial environmental issues to provide an additional perspective to that of the teachers. It was felt that the students' perspective would provide the researcher with additional evidence about the ways and extent to which the teachers enacted their beliefs in the classroom, and opened up the possibility of moving beyond a simple description of what the teachers aimed to achieve. A similar, informant style of interviewing was adopted, although greater input and encouragement was often required from the researcher than in the teacher interviews. However, the aim was to allow students the freedom to lead the discussion as much as possible and to enable a relaxed conversation to take place. The usual format was to interview each student twice individually for about 20 minutes, and once with the other students for about 40

minutes [6]. As with the teacher, the first two interviews focused on specific events in lessons and the third was wider ranging and involved explicit discussion about the research focus. In the final interview, the students were interviewed as a group to enable a broader discussion to take place between the students about the more general questions concerning the research focus. In addition, the final interview was of longer duration to enable issues to be explored in some depth. In order to facilitate agreement, each interview was arranged separately and at its conclusion students were asked if they would be willing to do another. The rationale for the reduction in number of student interviews in the final case study was similar to that for the teacher interviews (see section 3.5.2). Each interview was again considerably extended.

As a focus for the discussion of specific instances in lessons, some form of stimulated recall was desirable. However, rather than using audio-tape replay as in the teacher interviews, a decision was made to utilise instead copies of the transcript which students could read through. There were a number of reasons for this decision. Firstly, the students' comments were not picked up well on the tape, and had frequently required the aid of observation notes to enable interpretation during transcription. Since one of the aims of these interviews was to discuss individual remarks in lessons, it was essential that these should be as clear as possible. Secondly, it was felt that the use of a transcript was likely to reduce reactivity from the students who were felt to be potentially more self-conscious about hearing themselves on the tape than the teachers. Transcripts were marked with 'T' and 'P' for teacher and pupil comments, but individual students were not identified, thereby emphasising the confidential nature of the data.

Interviews were conducted in a variety of places, often suggested by the students. These were generally empty classrooms or music rooms, although a couple of interviews had to be undertaken in empty offices due to lack of available classrooms. Interruptions by teachers or other students were dealt with by informal chatting until the person had left. All interviews were undertaken in students' free periods or lunch breaks to avoid removing students from classes. The aim was to be flexible and relaxed so that interviews were not considered to be a chore. All interviews started with an explanation of the research purpose, and with assurances of confidentiality. It was also made clear that the aim was to understand their views, rather than to test their knowledge or understanding. Efforts were made to be as non-directive as possible, and to keep the atmosphere light throughout the interview. The interviews were again tape recorded using a small recorder with built-in microphone, taking only occasional notes

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[6] See appendix A1.5 for examples of interview schedules.

by hand. Students were always asked first if they were happy for me to record the interview and it was emphasised that no-one else would hear the tape and nothing would be reported back to their teachers.

All interviews were transcribed fully, noting as much detail as possible. Powney and Watts (1987) mention that in paired or group interviews, it can be difficult to separate out the voices of different students on the tape. However, by the time the interviews were carried out, the voices of the selected students were very familiar, therefore this was not a problem.

3.6 Research relationships

The development of good relationships between the researcher and research participants was considered particularly important given the aim of understanding classroom events from the perspectives of the participants. In addition, the research demanded a lot in terms of time and effort from both teachers and students, therefore it was crucial that they felt motivated to continue their involvement. Three key concerns were identified in relation to building relationships with research participants:

1. Inclusion of teachers and students
2. Encouraging authenticity
3. Ethical issues

Each will be addressed in turn.

3.6.1 Inclusion of teachers and students

A primary concern in this study was the perceived difficulty of achieving good research relationships with both teacher and students simultaneously. Since access to the classroom had, of necessity, to be obtained through the teacher, the major problem anticipated was in terms of relationships with the students. The "hidden danger" of being associated in the minds of students with the authority structures of the school was of key concern (Cooper, 1993). The problem was that it was necessary to spend considerable time with the teacher, yet it was important not to be viewed as a surrogate teacher by the students. In order to overcome this problem, a number of steps were taken to nurture relationships with students and avoid being identified too closely with the teacher, informally chatting outside the classroom and at activities outside the school (for example at a rainforest conference), and encouraging them to use my first name. In an attempt to provide students with a greater feeling of involvement in the study, I also introduced the research to them in the first observed lesson, and invited questions and comments. Only once a reasonable level of rapport had been achieved (during the two week lead in period) were the students asked if they would agree to be interviewed.

The relationship with the teachers appeared less problematic, with my main concern being how to present myself to them as someone who was not a teacher, nor an expert, but was nonetheless worthy of their time and attention. Steps taken to achieve this aim involved careful personal presentation, the provision of written information about the study, and an efficient response to any queries about the research. However, during the pilot study, a related issue emerged which demonstrated an unanticipated difficulty, as it appeared that I had been unwittingly cast into the role of 'expert' by the teacher, following an informal conversation about rainforests. This illustrated one of the key conflicts in qualitative research between the need to reveal personal information in order to aid the development of a relationship of mutual trust, whilst at the same time wishing to avoid influencing the participants' actions. In the main fieldwork period, greater care was taken to avoid informal conversation about the topic being taught in the lessons.

3.6.2 Encouraging authenticity

Cooper and McIntyre identify a key challenge that may be encountered by researchers wishing to obtain authentic accounts of events from pupils and teachers:

> *"How could we deal with the possibility that the teachers and pupils might present merely plausible as opposed to authentic responses to our requests for information?"* (Cooper and McIntyre, 1996, p.30)

The meaning of 'authentic' in this context does not imply that the aim is to access the participants' inner self, merely that the aim is to encourage revelation of teachers' and students' actual perceptions of the matters of interest (see Cooper, 1993). This is important because interviewees, although theoretically able to stop the interview at any point are unlikely to do so, especially in the case of students where repercussions might follow. Given that interviewees are unlikely to leave, it is important that they are not just providing an answer in order to please the interviewer, or to terminate the interview as quickly as possible. One of the solutions to this problem is to build a trusting relationship where research participants feel willing to share their thoughts and concerns with the researcher.

In order to encourage authenticity, a number of steps were taken to build trust with participants. These included provision of detailed information about the study and an outline statement about potential ethical issues for the teachers, spending time informally with both teachers and students, and explicitly acknowledging participants' control over decisions about answering interview questions. Within interviews, attempts were made to maintain a non-judgmental stance, neither explicitly agreeing or

disagreeing with answers given. Gentle probing was used to encourage recollection of thoughts, rather than to suggest answers, and body language was deliberately attentive, attempting to display overt listening behaviours - nodding, leaning forward, smiling, and other actions indicating an interest in what the interviewee is saying. Following the lead of Cooper and McIntyre (1996), the teacher was encouraged to emphasise the positive aspects of lessons, to reflect on what went well thereby avoiding the threat of criticism. Finally, the concentration on shared concrete events, encouraged interviewees to concentrate on specific instances, rather than making general statements.

3.6.3 Ethical issues

It has been noted that participating teachers were provided with information concerning the study's aims and methods. However, in an attempt to reduce the possibility of undue influence being exerted upon the teachers (as represented in principle 1), a central issue in the research - that of the focus on the more value-laden aspects of environmental issues - was not mentioned. The possibility of influence had emerged as an issue during the pilot study, where it appeared that mentioning attitudes and values could lead the teacher to focus more than normal on the more controversial aspects of the topic being taught. Since the aim of the research was to observe normal classroom practice, this was obviously to be avoided if at all possible. Thus, in the main study, teachers and students were informed that the research aimed to obtain their views on teaching and learning about environmental topics in 16-19 geography A level. The teacher was also given a written note which provided somewhat more information and stated that I aimed to "produce an account of teachers' classroom decision-making in relation to environmental topics, and to investigate the reasoning behind students' interaction in the classroom" (see Appendix A1.1). However, the theme of attitudes and values was not mentioned in an attempt to reduce reactivity by either the teacher or students.

Whilst this procedure reduced the possibility of researcher influence, it did raise an ethical issue concerning openness and honesty with participants in the research. Research relationships were considered crucial to the success of the study and yet information was being deliberately withheld from the participants. This was an issue which could not be fully resolved. However, because of my concern about the somewhat covert nature of the research focus, more written information on ethics and the rights of research participants was provided than in the pilot study (see Appendix A1.2). It was made clear that the aim of the research was to understand classroom events from the point of view of participants rather than evaluate their activities by some external standard. However, it was also emphasised that the researcher would interpret the results in the light of the data collected and reserved the right to publish without the express permission of participants. In this way it was felt that participants were being

given as much information as possible under the circumstances. Moreover, in the final interviews with teacher and students, the precise research focus was made clear and their views sought more explicitly.

Although this decision raised ethical concerns, it appeared to be vindicated by an event which occurred in the first case study. In one lesson, the following dialogue took place:

Alex: This is animals etc. (unclear) .. and it's my opinion ... freedom of thought ..
Teacher: That's fine. I know I was imposing my values on you 'cause I want you to start .. thinking as caring human beings.
Andrea: You're not supposed to impose your values on us.
Teacher: I know, I know I shouldn't do but I will occasionally ... I have to get you thinking and talking and discussing sometimes, so sometimes I will impose my view ... or try to! 'Cause it does get you talking. If I just accepted what you said and said nothing, no-one would even think about it.

Had attitudes and values been mentioned as part of the research focus prior to this point, it would have been difficult not to conclude that this had influenced the teacher's comments in this lesson. Thus the strategy had significant advantages which appeared to outweigh the potential disadvantages.

A final ethical concern related to the process of collecting data about teachers from their students. It has been suggested that teachers may feel threatened or undermined by having their teaching discussed by students, and that this might affect their relationship with the students, or their classroom discipline (Brown and McIntyre, 1993). Whilst this was not a concern which was explicitly raised by any of the teachers, it did emerge as a potential issue in the first case study, in which the teacher expressed reservations about the choice of students with whom interviews were being conducted. It appeared that her relationship with one of the students in particular was not good, and she was clearly worried about what he might say. These concerns emerged gradually, whilst the research was in process, therefore withdrawing the student at this stage would have been difficult. As in all interviews, I avoided explicit agreement with any views expressed by the student, not wishing to endorse his view of the teacher. Moreover, taking the teacher's concerns on board, certain quotes made by this student have been deliberately omitted from the thesis in the light of this knowledge [7]. In the later case studies, the teachers were asked explicitly during the lead-in period to comment on the final list of students for interview, and it was emphasised that, for reasons of confidentiality, it would not be possible for me to report back any comments made by the students.

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[7] These quotations would, however, in no way alter the major findings presented here.

3.7 Influence of the researcher

It is obviously hard to estimate the influence of the researcher on the data obtained. My gender, age, race and experience may all have influenced the data, but it is difficult to know in what ways. The complex issues relating to gender are those most widely considered in research methods texts: women are often considered to have privileged access to certain information on the grounds that they are seen as unthreatening and empathetic (Hammersley and Atkinson, 1995). In this study, my youth and inexperience may also have conferred an advantage, especially when interviewing students. However, they also had the potential to cause problems in being taken seriously by the teachers, although I attempted to cast myself in the role of 'interested learner'. Nonetheless, as illustrated by my experience in the pilot study where I was cast in the role of 'expert', it was not entirely possible to control the ways in which research participants' interpreted my role.

My professional background may also have influenced the way I was viewed by research participants. My status as a non-teacher may be seen as an advantage or disadvantage for working in schools. On the one hand, it may be less threatening to the teachers who might expect me to be less judgmental. On the other hand teachers may assume that I cannot understand their point of view without that shared professional background. It may have made me more sympathetic to the teachers as I did not bring my own standards of teaching with which to compare them. However, I sometimes felt that I tended to view lessons with a student's eye. My role as a non-teacher certainly conferred a distinct advantage in relationships with the students, several of whom asked explicitly about this, an issue which was clearly important to them.

Another issue of concern was that I might be viewed as a radical environmentalist, thus leading to bias as respondents attempt to convey a 'green' image. Strenuous efforts were made to avoid this - being non-judgmental about any views expressed; avoiding informal discussions about research issues; and also by dressing smartly, thus avoiding the stereotypical 'environmentalist' look! The mixed responses from interviews seem to indicate that this had not been a problem, with neither the students or teachers seemingly aware or concerned about my environmental viewpoint, as shown in the following extracts:

Teacher: I think the danger of doing environmental education is that everybody thinks you're a green, banner waving sort of swinging from the top branch of the tree, fervent and polarised view, and ... that doesn't work in this world, it doesn't actually get people very far ..

I: Do you see yourself as environmentalists? (General laughter)

Sarah: Nope! Not at all!

Will: You must be joking!

Andrea: Not in another country.

Alex: Not as in waving placards at government places .... I don't think the stage I am at the moment or my opinions really would go as far as to start waving banners and shouting at people and get arrested ..

Will: No, not by a long way

Sarah: And tying yourself to trees and living in them and stuff.

Will: And joining Greenpeace

Andrea: I don't think that stuff's very useful ...

Alex: I certainly don't see myself as being arrested for the, you know, under the criminal justice bill or something, waving flags ... and sort of like getting chained to something

Sarah: It's like the Newbury Bypass, yeah. If I was really concerned about trees, I would not go and sit in a tree with my little pots and pans, and say no you can't cut it down, 'cause that's absolutely pointless.

Many of the research participants were extremely derogatory about environmentalists, and certainly did not appear to place me in that category, despite the nature of the research.

Finally, my lack of experience as a researcher must be taken into account. Undoubtedly mistakes were made in interviews and other situations which a more experienced researcher would have avoided. However, strenuous attempts were made to avoid leading questions and other possible sources of bias, and many interviewees demonstrated that they were not prepared to be led by me or to have their views misrepresented. In addition, since I was generally perceived as unthreatening by both teachers and students, the possible influence may have been lessened.

3.8 Validity

In the light of the research methodology presented here, the validity of the data collection methods can be assessed. By validity, I mean the extent to which the methods described above enable the gathering of data which accurately represent the phenomenon under study (Hammersley, 1998)[8]. A central issue involves the extent to which the interview data can be said to capture the understandings which teachers and students have about the teaching of controversial environmental issues. Anticipating this as a potential issue, a

[8] Further consideration of validity in relation to the limitations of the research is given in chapter 7.

number of steps were taken in order to address it, such as scheduling interviews as soon as possible after the observed events with which they were concerned, and also by making considerable efforts to encourage authenticity, as described in section 3.6.2 above. However, if it is accepted - as argued by Brown and McIntyre (1993) - that the "only possible way" to understand the beliefs which underlie such complex interactions is by asking the people concerned, then it is obviously not possible to confirm directly the validity of the findings. Instead, reliance must be placed upon the procedures used in the collection of data and the ability of the researcher to create conditions in which participants will be both willing and able to articulate their understandings of lesson events. In this chapter, I hope to have provided sufficient information about the research procedures to enable the reader to judge the likely validity of the data so collected. Stringent efforts have been made to explain the procedures by which data were collected (and similarly, in the following chapter, how they were analysed) in order that such a judgement can be made. As can be seen in the findings (chapters 5 and 6), the richness of the accounts produced by the participants provides support for the belief that teachers and students genuinely attempted to understand and explain their perspectives to the researcher. Moreover, in utilising a number of the methodological principles devised by Cooper and McIntyre (1996) and Brown and McIntyre (1993), there are good grounds for confidence in the validity of the methods used.

A further issue revolves around the possible influence of the researcher on the data collection, and again, attempts have been made to address this in section 3.7 above. However, the possibility of reactivity (of either teacher or students) to the researcher's presence in the classroom is not insignificant:

> *"The very fact of observation can have an effect on behaviour. Where the people whose behaviour is being described know that they are being observed, they may adjust what they do in various ways, some of which may be relevant to the research focus."* (Foster et al., 1996)

A variety of steps were taken to avoid reactivity to the researcher - by nurturing good relationships with all research participants; by implementing a lead-in period before the research commenced; and by maintaining a non-participant role during lessons. In addition, all of the teachers stated that my presence in the classroom did not concern them, and they assured me that they had not changed their teaching as a result. However, there was some evidence that listening to extracts from lessons alerted teachers to issues which they might not otherwise have considered, since the interviews provided them with an opportunity for detailed reflection that was normally not available. Nonetheless, it seems unlikely that the teachers altered their behaviour so substantially that it would affect

the findings of the study. The short time period between each interview and the next lesson would have made it impractical for teachers to substantially alter their lesson plans; furthermore, the lesson data do not suggest that any of the teaching changed substantially during the period of the study.

Chapter 4
Methodology 2: Data Analysis

4.1 Introduction

The intention of this chapter is to describe in detail the different procedures which were undertaken during the main stage of data analysis, and the principles which guided these activities. The data analysis served several purposes including:

- Organising the vast quantity of unstructured data into a coherent structure to enable review and comparison;
- Developing an understanding of the teachers' beliefs and practices, based on a rigorous and systematic analysis of the data collected;
- Structuring the write-up of key findings from the study.

Although, for the purposes of clarity, these procedures have been described as a series of consecutive steps, the reality of doing the analysis was less straightforward. The principles and procedures outlined here are the end result of a long search for meaning in the data, involving many false starts and blind alleys. Moreover, the analytic process should not be viewed as a purely mechanical process, but also as a creative act on the part of the analyst, interpreting events and actions, utilising spontaneous ideas or serendipitous discoveries to develop theories that can then be tested out on the data. (See Glaser and Strauss, 1967 for a classic description of this approach). The final outcomes are based on the research focus and questions, insights from the literature, and evidence in the data (see figure 4.2). The main sources of data were transcripts of extracts from lessons observed by the researcher and transcripts of interviews with the participating teachers and students. Examples of the various procedures in use can be found in appendix A2, which contains all the appendices for this chapter.

Section 4.2 provides a theoretical framework for the analysis; section 4.3 reports the first phase of data analysis which involved analysing each case study in turn to develop and test propositional statements about each teacher's beliefs; section 4.4 describes the cross case comparison which was undertaken after each case study had been individually analysed (phase 2), the results of which are reported in chapter 5; and section 4.5 describes the analysis of the teachers' practices in relation to these key beliefs (phase 3), the findings of which are reported in chapter 6. An overview of the analysis and the relationship between cases is shown in figure 4.1.

Figure 4.1: Overview of analysis and relationship between cases

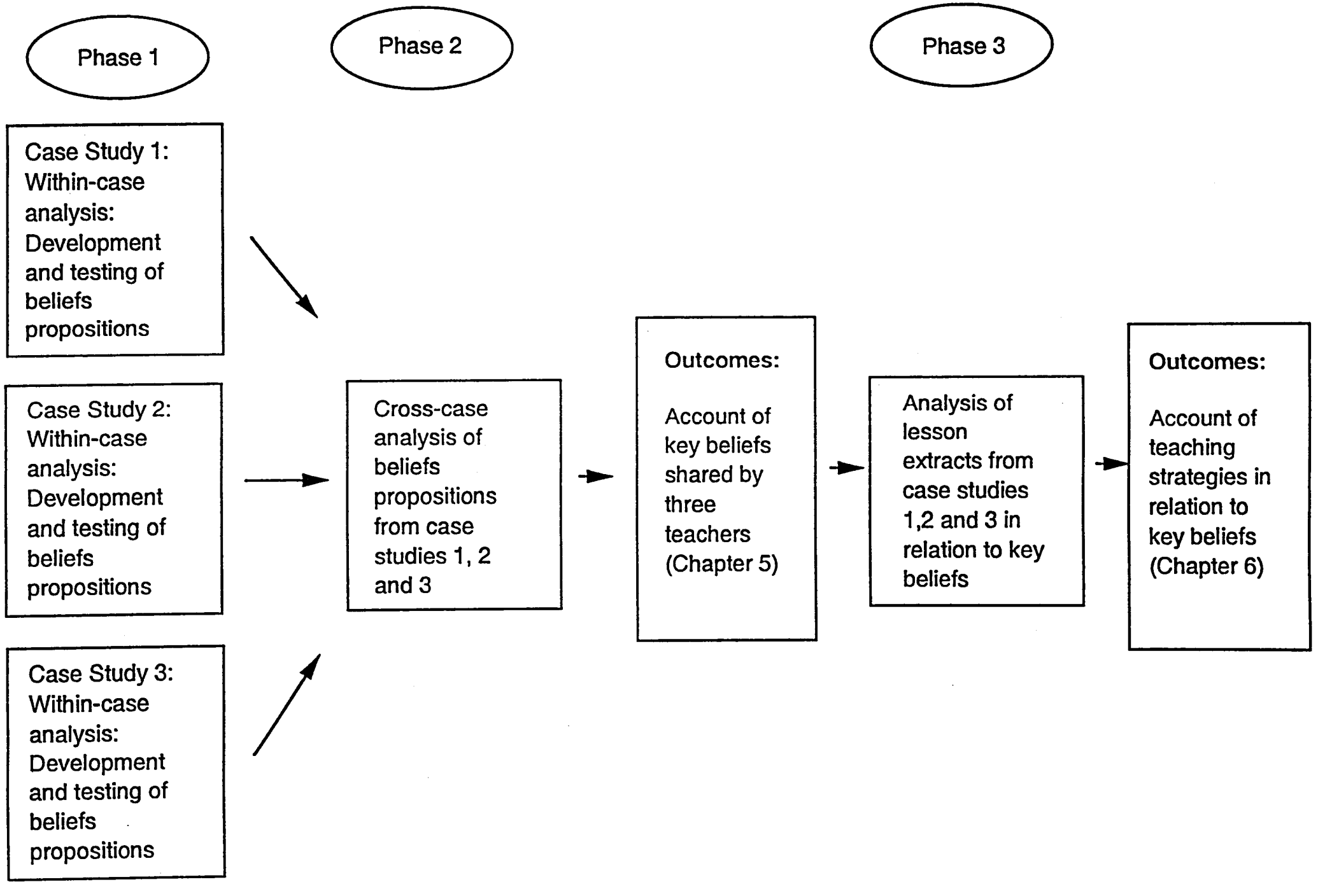
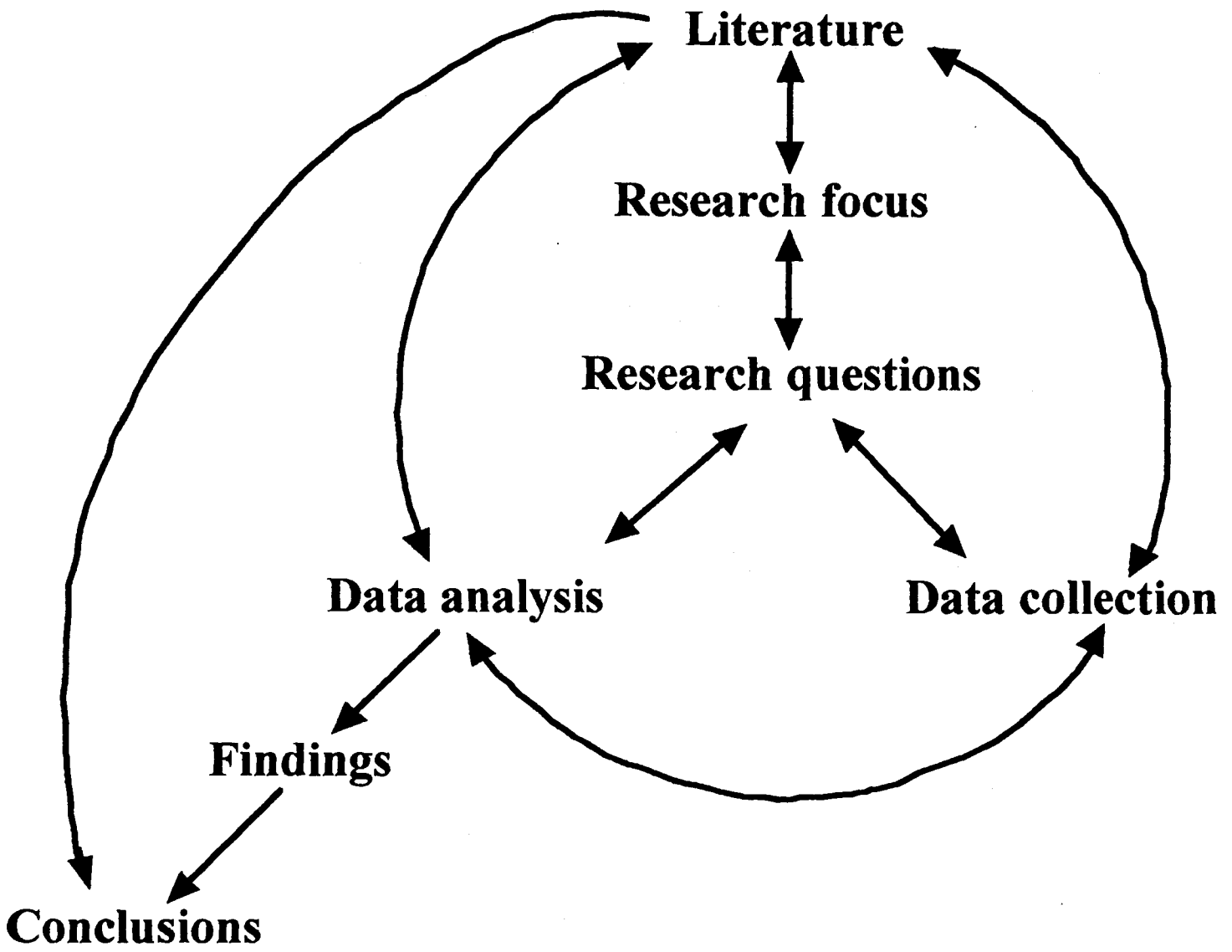


Figure 4.2: Relationship between different aspects of the research process



4.2 Framework for analysis

The aim of the data analysis was twofold: Firstly, to develop an understanding of the teachers' beliefs about teaching controversial environmental issues; and secondly, to examine how these beliefs are enacted in their classroom practice. Two key principles provided an organising framework for the analysis of data collected in this study:

Principle 1:
Data analysis and interpretation should start from, and be based upon, the teacher's own understanding of events.

In the first stage of analysis, the teacher interview data were analysed with the intention of generating a series of second-order constructs (the 'beliefs propositions'), which encapsulated the teacher's beliefs regarding the teaching of controversial environmental issues as revealed in the interviews. These propositions were derived from the data, and were checked carefully to ensure that there were no instances in the data which might refute them. However, the analysis could, and did, go beyond the teachers' understandings: In interpreting the lesson extracts (Phase 3), the researcher's own understanding was brought to bear on the situation, as the data were interpreted in the light of the teachers' beliefs. Moreover, in writing the final account of the teachers' practices (chapter 6), the perspective of the students was used to enrich the analysis and provide an alternative view of the lesson which the teacher was aiming to construct. Nonetheless, the analysis throughout is based primarily upon the teacher's own notions of what she was aiming to achieve, rather than upon an outsider's view of the situation.

Principle 2:
All propositions and outcomes should be supported by the evidence, to the extent that there are no negative cases.

The approach chosen for data analysis was that of analytic induction, involving the development and testing of propositional statements (Silverman, 1993; Hammersley and Atkinson, 1995). This procedure involves examining small bits of data to see if they fit the initial hypothesis or proposition, reformulating the hypothesis to enable the inclusion of all relevant data. Utilising the techniques of constant comparison and negative case analysis, analytic induction "offers a powerful tool through which to overcome the danger of purely anecdotal field research" (Silverman, 1993, p. 170).

4.3 Phase 1 Analysis: Thematic analysis of teachers' beliefs

The aim of this phase of analysis was to develop propositional statements about the teachers' beliefs about teaching controversial environmental issues, utilising the key substantive data of the teacher interviews. The process of analysis is described in terms of principles (the key decisions which guided the analysis), and procedures (the steps undertaken to complete the analysis). The same procedures were followed in the analysis of each of the three case studies in turn.

- **Over-arching principles**

These principles guided the scope and nature of the analysis, in order to ensure both efficiency and rigour in answering the research questions.

Principle 3:

Since the aim of the analysis is to understand the teaching of controversial environmental issues, data irrelevant to this focus will be discarded.

Such 'irrelevant' talk was defined as that relating to social matters, unrelated to teaching, or about those subjects which, whilst related to teaching in general, were not part of the research focus. For example, during each interview, there were usually a number of occasions when the discussion diverged from the research topic as illustrated below:

T: I'm being a bit cynical but really I was astounded at how little geography some people actually knew when I came here. It was horrifically frightening that some of the upper sixth hadn't a clue, but they quickly turned themselves round given the resources. They were all horrified by the previous year's results as well. They wanted to do better than that so it was a great motivation there. (CS1: T3 379-85

T: I think it's interesting how much Vanessa had to say. Because she's somebody who is - we've put her down as a predicted C, and she's someone that I've always felt if she worked harder she could do a lot better, and I think she really got involved in this and had lots and lots of .. she was really on the ball, and I think she really kind of showed what she could do. I mean if you compare how well she grasped what was going on, and how quick she was with things compared to perhaps someone like Dan, and then perhaps Dan with someone like Justine or James, you can see the complete kind of range. (CS2: T2 240-48)

These comments, whilst potentially interesting, were not considered directly relevant to the substantive research focus, the first being related to this teacher's early experience in her school, and the second to an evaluation of individual students' ability levels. Other reasons for exclusion of data bits were that they involved informal chatting between researcher and teacher, for example whilst the audiotape was being prepared for replaying, or that they involved discussions about the process of the research. However, it should be noted that there were relatively few occasions

when the interview data was felt to be completely irrelevant to the research focus, therefore very little of the data was discarded in this way.

Principle 4:

A series of checks must be carried out to ensure that no data which might refute the findings of the study has been ignored.

These checks were carried out throughout the data analysis, culminating in a final reading of the entire data set after the accounts had been drafted, to ensure that they accurately represented the data collected as a whole.

- **Principles for the development of themes [1] and data sorting matrix**

The next three principles were designed to guide the development of themes, and the data sorting matrix.

Principle 5:

The data used must be sorted in some way, to aid later review and analysis, therefore broad themes will be selected from the literature which encapsulate the key foci of the study.

Principle 6:

The themes chosen in advance from the literature are provisional, depending for their value on their fit with the data which have been collected. Themes which do not fit the data (i.e. do not accurately represent the data collected), or which do not aid in sorting the data (e.g. incorporate so much of the data as to be of no use) will be refined or rejected.

Principle 7:

The sorting matrix will represent all relevant data, will be clearly and explicitly linked to the raw data (using quotations and line numbers), and will sort the data in a way which assists the development of propositions.

This stage of data analysis was undertaken for each set of teacher interviews, and aimed to answer the first research question. Since this question concerned the teachers' espoused beliefs, it was not necessary to include the data from lessons or student interviews. Themes which reflected the broad focus of the study were selected in advance from the literature, and used to begin construction of a data sorting matrix

[1] Themes, in this study, are areas of potential interest which guided the development of propositional answers to the research questions.

(see below). However, these themes were accepted only as a provisional basis for sorting the data, and their utility and relevance depended on their fit with the data. Initial themes could be re-named, broadened or sub-divided to provide the best fit possible with the data[2]. The purpose of the development of themes, and the construction of the matrix was to sort the data into the most relevant areas of concern to aid later retrieval and interpretation by enabling easy review of the data across different interviews, and on different topics. The use of themes from the literature was viewed as a type of 'housekeeping' coding (Lofland and Lofland, 1995). The themes served to divide data up into convenient chunks for analysis - broad areas of likely concern within which all of the teachers' relevant comments were likely to be encompassed. The aim was to make the data more manageable by starting with a slightly reduced selection of data bits, grouped under themes gathered from the literature. However, later emergent ideas were checked against the entire data set to ensure no relevant data bits were omitted or overlooked.

In order to build the matrix, the following procedures were undertaken:

- *Initial themes were selected, based on the literature review and the research focus, which were thought to be of likely relevance to the teacher's beliefs about teaching controversial environmental topics.*

The initial themes aimed to be as broad and inclusive as possible to reduce the likelihood of relevant data being overlooked. They developed from the review of a wide range of literature (see chapter 2), and aimed to enable the inclusion of all data that might be relevant to the teaching of controversial environmental issues. However, whilst informed by the literature, these themes were not fixed and unchanging; rather they were used as an initial device to sort the data into broad groupings. For each theme, a definition was written which clarified the data which might be included under this heading. For example, one theme was entitled, 'Teaching Geography', and its definition stated: *"This theme refers to the teachers' beliefs about teaching geography. It incorporates the teachers' views of the importance of teaching geography, their general aims when teaching geography and their perception of good geography teaching."* Other initial themes included 'Environment/Environmentalism' and 'Teaching Strategies for Controversial Environmental Issues'. (See Appendix A2.1 for other themes and definitions).

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[2] The initial themes selected, and the alterations made to them during this stage of analysis, can be seen in Appendix A2.1.

- *Each interview was re-read carefully and a contact summary sheet produced,[3] noting key points (with line numbers and quotes) in relation to the selected themes in a table format (see below).*

Extract from case study 3 contact summary sheet (T interview 1)[4]

Theme	Data Relating to theme
Teaching geography	"It seems to me that, at the end of the day, what we've got to be able to do (as teachers) is to satisfy the examiner, to have our students ready enough to answer exam questions." (12-15)
16-19 A level	"I'm increasingly aware that the syllabus had these specific lines in it, these little nuances, and you've really got to pick up on them. And when you look at the key idea again it says that if you're looking at human interference on ecosystems, there are some real key ideas to put over: The idea of short term, long term, and of different scales." (114-20) "16-19 is very much sort of environmental issues and you are frequently being given the opportunity to empathise with different people and to understand their viewpoints. And that's a really important skill I think they need to develop. They need to be able to identify different groups, how these different groups are constituted, what are likely to be the viewpoints of those. So that when they're coming to look at management plans ... they're understanding, OK well how will these groups react in turn to those proposals. It's a theme that runs through all the decision making papers and it is very important that they look at that." (420-428)
Enquiry approach	"The (case study) I went for ... was actually a decision making paper, and therefore not only were the resources adequate and good, but it also encourages them to adopt an enquiry approach ..." (47-57) "I think in today's lesson they were very quick to identify what are the initial (enquiry) questions that would guide your thinking, and they were able to understand that later on if they needed to follow that through there were these pieces of information that they would need. They were a bit woolly about what it was precisely, but ... with a little help, they got there." (60-5)

It was at this stage that discrepancies between the selected themes and the data were noted and slight alterations made to the themes as necessary (see appendix A2.1). Alterations were made to enable all the relevant data to be sorted into one or other of the themes. Whenever a theme was altered in any way, any data bits previously sorted were re-grouped according to the new theme(s). The tables produced by this means enabled the researcher to revisit any interview and distinguish the key points without the necessity of re-reading the entire transcript every time. Field notes could also be integrated into these summary sheets if deemed relevant.

- *Each contact summary sheet was reviewed after completion, and checked against the transcript to ensure that no relevant data had been ignored.*

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[3] The term 'contact summary sheet' is used here to describe a table relating to each interview, containing a list of all themes and with a catalogue of associated data bits.

[4] NB: This contact summary sheet has been shortened for the purposes of this illustration. The original sheet contained further examples of data relating to each theme which have been removed due to space limitations.

If data deemed relevant to the study had not been included, these were added to the table in one of the existing themes if possible. If the data did not fit any of the themes, further alterations were made to enable their inclusion in the table. The aim was to make the themes inclusive enough to encompass all data which might potentially be relevant to the study. However, further checks were also undertaken to ensure that no relevant data had been overlooked (see sections 4.4 and 4.6).

- *When completed, all contact summary sheets were integrated to form a data sorting matrix. This matrix enabled easy review of the data relating to each theme across each interview.*

The matrix constructed contained the list of themes down the left hand side, and the teacher interviews across the top. It included lengthy, representative quotations from the raw data and line numbers showing the source of the quotes. Thus data relating to each theme could be compared across all three interviews[5], enabling the researcher to develop propositional statements about each teacher's beliefs.

- **Principles for the development of propositions**

The third set of principles guided the development of propositions from the data sorting matrices. These propositions represent second order constructs (Schutz, 1973), which seek to encapsulate each teacher's beliefs about teaching controversial environmental issues.

Principle 8:

The propositions are theoretical constructs, individual to each teacher, which aim to describe the teachers' beliefs and aims when teaching about controversial environmental issues.

Principle 9:

Since the aim of the analysis is to provide information about a particular aspect of teaching environmental topics, it is not essential that all data collected should be fitted within one of the propositions; however, it is essential that no data should contradict any of the propositions.

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[5] Two interviews in case study 3.

Principle 10:

Propositions must reflect the beliefs of the teacher with respect to the teaching of controversial environmental topics, and must be supported by evidence found in the interview data.

This stage of data analysis followed on from the development of the data sorting matrix, and the propositions were derived from and supported by the data set represented in the data sorting matrix. The following procedures were used in the development of propositions:

- *The data in the sorting matrix was read and re-read, in an attempt to determine the beliefs of the teacher in relation to each theme.*

This additional familiarisation period was deemed useful in order to review the data within each theme across the different interviews, and to start to develop a picture of the teacher's beliefs in relation to the research focus.

- *All the data bits relating to each theme in the data sorting matrix, were summarised into a number of discrete statements about that teacher's beliefs, based on similarities between the data bits. These were termed the 'initial propositions'.*

There was no restriction on the number of initial propositions which could be developed, although the aim was to avoid overlap between one and another. All data on the matrix had to be incorporated into one of the initial propositions. Although the themes were used as a guide to proposition development, data bits did not have to be grouped with others within their own theme if they appeared to fit better elsewhere. However, it was the case that most similarities were found between data bits in the same theme, and accordingly, these data bits were grouped into propositions within the theme.

- *Once each proposition was formulated, it was tested against all the data bits allocated to it in the matrix to ensure that there was a good 'fit' between data and proposition.*

In this step, each data bit allocated to a proposition was examined in turn, and the following question asked: 'Is the meaning of this data adequately expressed by the proposition?' If the answer was 'yes', the data bit could be used as evidence for the proposition, if 'no', then the proposition was altered slightly to incorporate the data

bit, or a new proposition developed. Any data bits which could not be fitted easily into a propositional statement were put to one side and re-examined once all propositions had been developed, using the same testing process. An illustration of this process is given using an example from the case study 1 data below[6]:

Theme : Enquiry approach **Teacher 1**

Definition

This theme refers to the teacher's beliefs about the enquiry approach, one of the key aspects of the 16-19 approach to geography teaching. It includes her beliefs about what the enquiry approach involves, the extent to which she uses it in her teaching, the potential advantages of the approach, and the possible problems with it.

Examples:

Theme	**Interview 1 data**	**Interview 2 data**	**Interview 3 data**
Enquiry approach	"I always like to think that they're going to come in and have something they find out for themselves ... If I reveal everything to them ... then there's nothing for them to enquire into ... there's no discovery" (237-41) "(The 16-19 teacher's file) still says 'are you an enquiry teacher?' And I glanced through it and thought, 'well ... about 60%'. But if I'd been 100% I don't think I'd be as good a teacher ... Because I think it's great for really able kids (but for the D and E grades) you could be in danger of dropping them off the bottom." (402-12)	"I think it's something that hasn't developed through the school. They've had a lot of teacher led activities ... the expectation has been that everything comes from the teacher ... I'm trying to turn it round so that they should be producing the understanding and knowledge and feeding that into the class ... it would be easier for me to just go in and teach it straight off but it wouldn't turn them into students." (178-187)	"Through enquiry ... I think there's a lot of value in what students find out for themselves rather than just being told by us ... But it has to be done in a framework ... so that the students feel secure on what they're doing ... Otherwise they'll flounder .." (208-17) "I think informed debate, informed discussion, informed teaching and informed learning." (226-7) "I prefer them to come in with a professional training background so they are not the lay member of the (enquiry) panel, they are the professional member of the panel, who can ... draw on a background of knowledge and understanding, to use that." (400-3)

Initial proposition:

This teacher believes that an informed and structured enquiry approach is very valuable in terms of student development, but perceives constraints relating to the ability level of some students and their expectations about the traditional teacher role.

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[6] For a list of all initial propositions for case study 1, see appendix A2.2

- **Principles for grouping propositions**

After developing the initial proposition set, it was noted that there was considerable overlap between different propositions, and that there were apparent similarities between propositions from different themes. This stage of analysis aimed to re-group propositions into 'emergent themes', which reflected more accurately the teacher's concerns in relation to the research focus, and to produce a new, reduced set of propositions which more concisely described the teacher's beliefs.

Principle 11:
Propositions should be grouped in order to reflect the particular concerns of the participant, rather than to reflect the original themes selected from the literature.

Principle 12:
If there is deemed to be significant overlap between propositions, they should be combined to form a new proposition which provides the most economical expression of both initial propositions whilst nonetheless retaining the meaning of the raw data.

The aim was to group propositions in order to capture the essence of the teacher's beliefs in as few propositions as possible. Given the initial grouping in terms of themes from the literature, some of the propositions in different groups had obvious similarities. The methods used to rationalise the propositions and group them into emergent themes are described below, and exemplified in relation to the propositions from case study 1:

- *Commonalities in wording or meaning between initial propositions were used to group propositions together. Groups were re-named according to the observed commonalities between the selected propositions*

The initial themes served merely as sorting devices for the data to enable proposition development. At this stage, propositions were re-grouped according to the concerns of the participants which had emerged in the initial propositions. This stage was deemed necessary since there were clear patterns in initial propositions which ran across the thematic groupings selected from the literature. For example the three initial propositions below were deemed to have similarities between them, despite having been initially grouped into different themes:

9. This teacher feels that **students' attitudes** towards environmental and development issues tend to be **simplistic**, coloured by their social background, and often **based on ignorance**, resulting in a **lack of empathy** for third world countries and peoples. (Theme: Teacher's view of students' environmental attitudes)

10. In her teaching, this teacher **aims to challenge students' simplistic attitudes** towards environmental and development issues, to **break down stereotypes**, and to **encourage students to empathise** with other people and cultures, but she feels that this is difficult to achieve. (Theme: Teacher's aims for students' environmental attitudes)

14. This teacher chooses teaching materials for lessons about controversial environmental issues which address the issues in a way that **challenges stereotypes and commonly-held views**, with the aim of encouraging students to think about their own views. (Theme: Teaching strategies for controversial environmental issues)

The commonalities between these 3 propositions were related to the teacher's belief that it was important to challenge students' attitudes, if she perceived them to be ignorant and /or simplistic (see bold type, above), and they were therefore grouped together under an emergent theme entitled, 'challenging simplistic attitudes'.

- *Any remaining propositions, which did not have similarities with others, were examined in the light of their original theme, and the theme re-named, if necessary, to more accurately describe the meaning of the proposition.*

For example, after re-grouping, the following proposition remained in the initial theme, 'teaching strategies for controversial environmental issues':

13. This teacher sees her role in teaching about controversial environmental issues as providing balance, encouraging students to state their views, and enabling them to make their own decisions, rather than imposing her own attitudes on the students, since they can be easily influenced.

After re-grouping, this was re-named, 'providing balance', since the original theme was now too broad in scope, and would have overlapped with other emergent themes. The final propositions were grouped under 7 emergent themes which were, for teacher 1:

1. Teaching A level geography
2. Using the enquiry approach
3. Taking a critical view
4. Basing attitudes on evidence

5. Challenging simplistic attitudes
6. Encouraging optimism
7. Providing balance

The themes developed were individual to each teacher in the study, although there was considerable overlap between them.

- *Propositions within each emergent theme were examined for overlap, and reduced in number by combining two or more propositions wherever possible.*

As a final step in the evolution of the propositions, similar propositions were compared for overlap, and composites of two or more propositions developed. Propositions were only combined if this could be achieved without losing the meaning of each individual proposition. For example, the propositions 9 and 10 (cited above) were combined as shown:

In her teaching, this teacher aims to challenge students' ignorant, simplistic attitudes towards environmental and development issues, to break down stereotypes, and to encourage students to empathise with other people and cultures, but she feels that this is difficult to achieve because of students' social backgrounds.

In this way, the 17 initial propositions formulated for case study 1 were reduced to a list of 11, entitled the 'provisional propositions' [7].

- **Principles for testing and modifying propositions**

In this final stage, propositions were tested against the entire interview data set, and slight changes made to enable the propositions to provide the most accurate reflection possible of the teacher's beliefs and to ensure that no proposition was refuted by evidence in the data. A number of principles guided the changes which could be made to propositions as follows:

Principle 13:
Propositions should be strengthened, if a more precise formulation can be produced which is fully supported by the body of the data.

[7] See appendix A2.3

e.g. Proposition 6 was altered to give a more precise description of the teacher's views on the benefits of the enquiry approach as, on review of the entire body of data, this seemed to more accurately reflect the teacher's aims.

6. This teacher feels that an informed and structured enquiry approach is very valuable in terms of student development, but she perceives constraints relating to the ability level of some students and their expectations about the traditional teacher role.

Changed to:

6. This teacher feels that an informed and structured enquiry approach is very valuable for the students in terms of increasing self-confidence and developing research skills, but she perceives constraints relating to the ability level of some students and their expectations about the traditional teacher role.

Principle 14:

Propositions should be weakened if, on review, the body of the data does not fully support - or even appears to negate - one part of the proposition.

e.g. When proposition 6 (cited above), was examined closely in the light of all available evidence, it was discovered that some data suggested that the teacher felt that even the lower ability students had coped very well with a piece of enquiry work - thus demonstrating that this was not a necessary constraint of the enquiry approach, merely a potential one which could sometimes be a problem. The proposition was therefore altered as follows to reflect this discovery:

6. This teacher feels that an informed and structured enquiry approach is very valuable for the students in terms of increasing self-confidence and developing research skills, but she perceives potential constraints relating to the ability level of some students and their expectations about the traditional teacher role.

Principle 15:

The wording of propositions can be altered if, without substantially affecting the meaning of the proposition, the new wording provides greater clarity and readability.

E.g. The wording of proposition 5 was changed from:

a) 'based on factual geographical knowledge, backed up by evidence from case studies' to

b) 'based on evidence and geographical knowledge'

to make for easier reading.

To test the final propositions, all interview data were re-read carefully, in conjunction with each group of propositions, and the supporting evidence was collated in a series

of tables[8]. A final review of the data was made at this stage to ensure that no evidence in any of the interviews refuted any of the propositions.

Although the intention had never been to utilise all interview data in this analysis, a final check was undertaken to establish the proportion of data which had been used as evidence for the propositions. Since the interview style had been naturalistic, it could be assumed that some of the data would reflect interests other than the main research focus, and also social talk between teacher and researcher. However, it also seemed reasonable to hope that the final propositions - hereafter described as the 'beliefs propositions' - would encompass at least the majority of the data, in order that they could realistically be said to reflect the teacher's beliefs on the research topic. A high percentage of data use was felt to provide some supporting evidence that data bits were not selected simply to support a particular case[9].

4.4 Phase 2 Analysis: Cross-case comparison and identification of key beliefs

The aim of this stage of analysis was to compare the beliefs propositions for the 3 teachers, developed in phase 1, in order to identify commonalities between them. Those areas of concern, common to all three teachers (entitled key concepts), were then considered in further depth, examining the interview data in detail to investigate the teachers' understandings of the key concepts, and developing an account of the teachers' key beliefs (reported in chapter 5). Using these key beliefs, phase 3 aimed to study parts of the lesson data in detail, in order to identify ways in which the teachers' beliefs were put into practice in the classroom, and to draw out some of the problems and possibilities they encountered (reported in chapter 6). The rationale for the cross-case comparison was that the results of this study would be of most benefit if they had the potential to be generalised to other teachers. This suggests that, "... the analysis of the data must attempt to establish generalisations by seeking common concepts across teachers ..." (Brown and McIntyre, 1993). The nature of, and limitations to, such generalisations are discussed in further detail in chapter 7.

- **Principles for developing key concepts**

At this stage, a list of 11 or 12 beliefs propositions had been developed for each teacher, based on their beliefs as expressed in the interviews. To prepare for the next

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[8] See appendix A2.4
[9] The results of this test are reported in appendix A2.5

stage of analysis, which involved an examination of the lesson data, it was necessary to determine which of these beliefs might be most relevant to the study. The reason for studying each case was in order to learn more about the problems and possibilities encountered when teaching about controversial environmental issues, what Stake describes as an 'instrumental' case study (Stake, 1995, page 3). Hence, although each teacher was viewed as an individual in his/her own right, the overall aim of the research was to draw out similarities between cases, rather than to examine each teacher's unique beliefs for their own intrinsic interest. At this stage, therefore, the aim was to develop 'key concepts' - areas of belief shared by all three teachers - which could then be investigated in greater detail.

Principle 16:

The aim of this stage was to identify key concepts which were important to all three teachers, therefore the focus was on commonalities between the beliefs propositions of these teachers

Principle 17:

Only those beliefs which emerge as being significant to all three teachers will be used as a basis for the analysis of the lesson data.

The following procedures were undertaken:

- *The beliefs propositions were read and re-read in conjunction with each other, in order to identify commonalities in wording or meaning between the three teachers.*

Similar words or phrases were underlined and noted down as possible key concepts (see below):

Case Study 1:

- This teacher sees her role in teaching about controversial environmental issues as providing balance, encouraging students to state their views, and enabling them to make their own decisions, rather then imposing or promoting her own attitudes, since the students could be easily influenced.

Case Study 2:

- This teacher believes it is essential to provide a realistic, balanced view of the issues and tries to provide access to a wide range of viewpoints and encourage empathy for other peoples or countries, using resources, role plays and class discussion, but she perceives potential constraints relating to the students' maturity and listening skills.

Case Study 3:

- Aside from committing himself to a stance against racist comments, this teacher believes that he normally maintains a position of balance or neutrality, but challenges students to justify their own views by asking provocative questions, offering alternative opinions, and asking other students for their views, rather than imposing his own views, because he wants the students to come to their own conclusions.

In this example, it appeared that 'providing balance' was a key concept that was important to all three teachers in their teaching about controversial environmental issues, and was therefore an issue which warranted further study.

- *A table of 'key concepts' was drawn up, incorporating extracts from each of the beliefs propositions which reflected those concepts.*

The table facilitated comparison of those parts of the propositional statements developed for each teacher which related to each key concept[10]. The five key concepts which arose from this comparison were:

- **Using the enquiry approach** - all three teachers had mixed views about the enquiry approach, seeing both advantages with, and constraints on, its use.
- **Providing balance** - all three teachers felt that one of their aims was to provide a balanced view of the environmental issue which was further defined as involving a range of different views.
- **Encouraging independence** - all three teachers expressed a desire to encourage students to state their own views and make their own decisions, and a desire not to impose their own views.
- **Challenging students' views** - all three teachers shared the aim of challenging students to question their own views about the issue. In two cases the teachers noted that some students' views were simplistic or ill-informed.
- **Encouraging empathy** - all three teachers saw one of their aims as encouraging empathy with different peoples and different viewpoints.

- **Principles for analysis of teachers' beliefs in relation to key concepts**

Principle 18:

The aim of this stage is to investigate the key concepts in greater depth, in order to understand the range of possible meanings which underpin the teacher's beliefs about these concepts.

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[10] See Appendix A2.6

The next step was to investigate the teachers' beliefs in more depth and produce a 'catalogue of references' for each key concept. This involved gathering together all the data relating to each concept, and grouping data under a series of questions designed to increase the understanding of the concept's meaning. For example, in the case of the concept, 'Providing balance', the following questions were asked:
What do the teachers mean when they talk about balance?
What difficulties do teachers encounter with using balance?
Why do teachers value balance?
How do teachers try and maintain balance?
What tempers teachers' notions of balance? (e.g. What is it not permissible for students to say?)
How do teachers try and maintain balance? [11]
Similar questions were used to consider the other key concepts.

- *To enable these questions to be addressed, all data relating to the key concepts were gathered together to enable review.*

So, for example, all data bits from any of the teacher interviews which related to the concept of 'providing balance' were extracted from the main data set, and collated to create a 'catalogue of references'.

- *This catalogue of references was interrogated in order to find answers to each of the questions listed above. Any data bit which did not appear to answer any of the questions was put to one side.*

Data bits put to one side were considered later, and new questions developed if this was deemed necessary to enable their inclusion in the analysis. There was no restriction on the number of questions which could be formulated, but the aim was to avoid overlap between one and another. All data bits had to be used in answering one of the questions, since the final aim was to develop an account of that concept using all the relevant data.

- *One or more provisional answers to the questions were formulated, based on the accumulated data bits.*

Similarities between the data bits relating to each question were used to formulate one or more provisional answers to the questions (see example overleaf):

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[11] See chapter 8 for a discussion of these issues.

Example - Key Concept: Providing balance

Question: What do the teachers mean when they talk about balance?

Answer: Ensuring that students see more than one view of an issue

Examples of relevant data bits:

"I chose (the text) because ... it raises issues that other geography text books don't ... I chose it to debunk the myth that indigenous people ... always know best about the forest ..." (CS1: T1 24-9)

"I think (the video) showed different people's opinions in that it had the Greenpeace people on and it had the people from Chile who were living there more permanently, and the environmental secretary for Britain ... saying why they wanted to exploit the area." (CS2: T1 106-113)

"And there are times when you do offer balance ... (for example) there is the viewpoint of those that will say that river engineering has altered the Mississippi to the point that it floods, (others) will say that it isn't and, in that particular exercise, I would try to achieve some degree of balance in those arguments, and could say, there may well be points that we could agree with here and also in this one." (CS3: T2 450-68)

The outcomes from this stage of analysis were used to guide the final written account of the teachers' beliefs in relation to teaching about controversial environmental issues (chapter 5). It was at this stage that it became clear that there was substantial overlap between the key concepts, and these were integrated in the final account. Conclusions were then drawn about key beliefs which were common to all three teachers, and these key beliefs were used as a basis for the analysis of the lesson extracts, as described in phase 3 (below).

4.5 Phase 3 Analysis: Analysis of teachers' practices in relation to key beliefs

The aim of this stage was to link the lesson data in the selected extracts with the key beliefs identified in chapter 5, in an attempt to answer the second research question concerning the ways and extent to which the teachers' beliefs are enacted in their classroom practice. Specifically, the question which was of particular interest was: How do the teachers resolve the dilemma between their twin aims of producing a diversity of views, without imposing their own views or becoming actively involved in an argument or debate? This question involved identifying the extent to which each of the teachers provided a diversity of views, and the ways in which this was achieved. The resulting account of the teachers' practices is reported in chapter 6.

- **Principles for analysis of teachers' practices in relation to key beliefs**

Principle 19:

The aim of this stage is to consider how the teachers' key beliefs are enacted in selected extracts from their classroom practice.

At this stage, the aim was again to make the data more manageable by focusing closely on specific sections (chosen previously, in line with the research focus), and ignoring other parts. Whilst these extracts from the lesson data were not necessarily considered to be representative of the lesson as a whole, they were believed to provide the greatest potential for understanding the ways in which the teachers' beliefs were enacted in the classroom, since they had been used as stimulus material for the interviews in which the teachers' beliefs had been revealed. Given the focus of the analysis on the teaching of controversial environmental issues, it was not necessary to analyse all the lesson data, therefore extracts were used to focus attention on key points in the lesson. The extracts had been chosen because they were concerned with environmental issues which had proved to be, or could potentially have been, controversial, and/or in which the teacher had explicitly mentioned attitudes and values[12].

Principle 20:

Familiarisation with the extracts in the light of the key beliefs is essential to aid the identification of patterns, points of interest, or similarities and differences between the teachers' beliefs and practices.

This stage of the analysis entailed repeated readings of the verbatim transcripts of the extracts and the lessons of which they were a part, listening to tapes of the lessons, and becoming thoroughly familiar with the data.

Principle 21:

Given that the intention is to understand the teachers' practices in the light of their beliefs about teaching controversial environmental issues, the key beliefs will be used as a basis for interpreting the lesson data.

The following steps were undertaken at this stage:

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12 See Methodology chapter for a detailed rationale for selection of these extracts.

- *Each lesson extract was examined in detail, and interrogated in relation to the key beliefs noted above, considering what the teacher is doing in each extract, and how this might help achieve his/ her stated aims.*

Each extract was examined closely in relation to the key beliefs to identify the ways and extent to which those beliefs were being enacted. This was facilitated by asking questions of the lesson data such as: In what ways and to what extent does the teacher provide access to a variety of views?; In what ways and to what extent does the teacher avoid stating his/her own views or becoming involved in an argument? Provisional answers to these questions were noted for each extract individually in point form (see Appendix 2.7).

- *Comparing the points noted for each extract, a number of categories of teaching strategy in relation to the key beliefs emerged.*

The provisional answers to the questions raised above suggested that the teachers' actions could be grouped into the following categories:

- **Eliciting students' views**
- **Enabling students to discuss their own views**
- **Challenging students' views**
- **Expressing differing views**[13]

Each of these strategies was used by one or more of the teachers in their teaching about controversial environmental issues, and appeared to represent different strategies for putting their key beliefs into practice.

Principle 22:

The use of the teaching strategies identified cannot be fully understood without reference to the students' responses to that strategy, therefore student interview data should be included in the analysis.

The data from student interviews was integrated into the analysis at this point to help understand the teachers' use of the various teaching strategies, and the possible implications of using each strategy from the students' perspectives.

- *Each teaching strategy was examined in greater detail, identifying when it had been used and with what purpose and, if possible, the implications of using the strategy.*

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[13] This strategy was later integrated into the strategy of 'challenging students' views', being viewed as one method which the teachers used to challenge students (see chapter 6 and Appendix A2.7).

- *All data bits from student interviews which related to each teaching strategy were grouped together with the lesson extracts.*

A catalogue of examples of each teaching strategy was compiled, noting which teachers used which strategy and under what circumstances. Data from student interviews were added to the catalogue, noting the similarities and differences between the students' responses to different strategies. These data provided the benefit of an alternative perspective on the classroom interaction, aside from those of the teacher and of the researcher. It provided the researcher with a deeper understanding of the classroom situation, and one which was not solely reliant on the teachers' accounts. The final description of the teachers' practices (chapter 6) attempts to integrate all three perspectives, and discusses the problems and possibilities which accompanied the use of each teaching strategy.

4.6 Final comment on integration of analysis and writing up the chapters

The writing of the final chapters was based closely on the analysis, as presented above. However, the writing process was also the final stage of analysis, whereby the key concepts were integrated, links between them articulated and discussed (chapter 5); examples of practice were investigated and interpreted, and the students' perspectives were considered (chapter 6); and more general theoretical insights were drawn out (chapter 7). After completion of the two findings chapters (chapters 5 & 6), the entire data set was re-read in an attempt to ensure that the final accounts accurately reflected the data therein. Moreover, each chapter was re-read carefully in an attempt to ensure the inclusion of sufficient references from the original data to enable the reader to judge the credibility and plausibility of any claims made, and further quotations were added where these were deemed necessary.

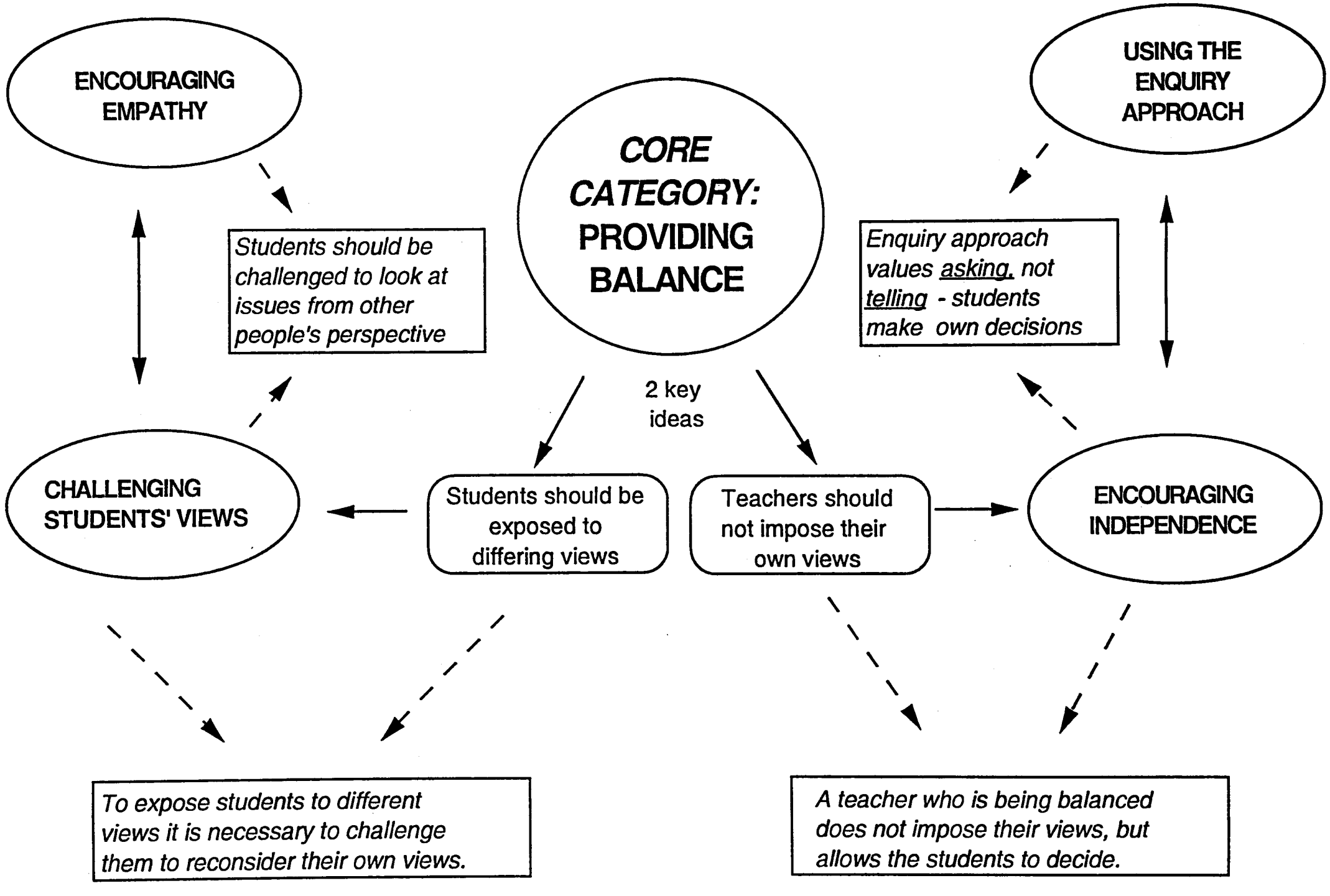
Chapter 5: Findings 1
The Teachers' Beliefs about Teaching Controversial Environmental Issues

5.1 Introduction

This chapter is based upon the five key concepts identified in the cross-case analysis as being central to each of the three case study teachers' beliefs about teaching controversial environmental issues (see chapter 4). These key concepts are: 'using the enquiry approach'; 'providing balance'; 'encouraging independence'; 'challenging students' views'; and 'encouraging empathy'. In the analysis, the five concepts were developed independently, and the data relating to each was treated individually. However, in terms of writing this chapter, it was felt that the significant links between concepts meant that a meaningful account could not be constructed without further integration. On further consideration of the body of data, 'providing balance' was identified as the central concept and the others were deemed to be subsidiary (see figure 5.1). For this reason, the concepts are not dealt with as separate issues in this chapter; instead the subsidiary concepts, and data relating to them have been integrated and interwoven into this account of the teachers' beliefs about 'providing balance'.

Data from all three cases support the finding that one of the teachers' main aims in their teaching was to provide a balanced picture of environmental issues by encouraging students to examine a range of different viewpoints. In achieving this aim the teachers sometimes felt it was necessary to challenge students' initial views, in order to promote empathy for other cultures or other people's views. Providing a balanced picture was also interpreted as requiring that the teachers avoid stating their own views openly, in order that the students might be encouraged towards independent thought and decision-making. (This strategy appeared to be influenced by broader pedagogical beliefs about the enquiry approach and also by fears about indoctrination.) However, despite this apparent agreement about the meaning of balance, the picture which emerged from detailed analysis of the interview data is that the teachers' views of balance were highly complex and, in some ways, problematic in terms of their potential for translation into practice in the classroom.

Figure 5.1: Teachers' beliefs - Links between concepts



This chapter starts by looking at the teachers' understandings of balance and the different strands of meaning of the term (5.2 - What is balance?). It then considers the teachers' reasons for valuing balance (5.3 - Why is balance important?), and their beliefs about appropriate strategies for achieving balance in the classroom (5.4 - How to achieve balance). Finally it looks at the difficulties encountered with maintaining balance (5.5 - Problems with balance), and situations in which balance might be inappropriate (5.6 - What might temper beliefs about balance?).

5.2 What is balance?

Two key ideas encapsulated what, for these teachers, was the meaning of balance in the context of teaching controversial environmental issues. These were:
a) Ensuring that students see more than one view of an issue, and
b) Ensuring that the teachers' own views were not imposed on the students.
Taking each of these key ideas in turn, the belief that more than one view should be presented to the students was expressed by each of the three teachers, and a variety of suggestions for achieving this were offered, including the provision of varied resources and the use of role plays. It was clear that one of the factors influencing the teachers' choice of resources and of activities when planning lessons was their desire to provide access to a diversity of opinions:

> "I chose (the text) because ... it raises issues that other geography text books don't." (CS1: T1 24-9)

> "I think (the video) showed different people's opinions in that it had the Greenpeace people on and it had the people from Chile who were living there more permanently, and the environmental secretary for Britain ... saying why they wanted to exploit the area." (CS2: T1 106-113)

> "We had very broadly touched on the fact that there are different viewpoints. We'd been talking before that about another decision making paper as well, where viewpoints were mentioned but we never - at that point - really got into that part of the paper. And I thought that this actually worked quite well because it was a good opportunity to get them into role play, representing different viewpoints." (CS3: T2 76-81)

However, each of the teachers placed emphasis on a slightly different aspect of balance. Teacher 1 focused particularly on balance as a way of providing a challenge to certain commonly held viewpoints, in one example aiming to "debunk the myth that ... indigenous people always know best about the forest." The teacher's more complex view of this issue was that:

> "... most people on this earth are trying to get a living, feed their families, and have the best quality of life ... and indigenous peoples and shifting cultivation, as long as their population levels stay quite low, that remains in harmony with the forest and they can cope with that. But once population levels increase, as the Maring's is, then they start to damage their environment." (CS1: T1 30-36)

This teacher was critical of the simplistic ideas which can be transmitted through some geography text books, especially in the lower school, and was keen to provide a balanced view which delved more into the complexity of the issues. As well as explaining this issue to the students, the teacher selected text books which covered the issue from a different angle:

> "... they've obviously been so taken aback by this idea because if you read ... the standard A level texts for 16-19, you quite happily go away saying, 'oh we'll leave the forest to indigenous peoples'. Then you read this thing about Papua New Guinea and ... you start revising your view. And I think that's perhaps why I put that in at that point, to make them stop and think." (CS1: T3 305-12)

The other teachers agreed that students should sometimes be pushed to extend their ideas about environmental issues, and to reconsider their own views:

> ".. you begin to ask them about the wisdom of deforestation and you tend to get an attitude that says, 'well if they're cutting down their forest, why do they do it? It's ridiculous, we should tell them how to stop it.' ... And what I was trying to get across is ... we have felled our woodland and we have contributed to the destruction of habitat but over a much longer period of time and it's a bit hypocritical to turn round and be critical about others." (CS3: T1 238-48)

So, although the teachers were keen not to impose their own views of an issue, they did feel that exposing students to a diversity of views could include challenging students' current understanding about an issue. Section 5.4 describes the strategies which teachers utilised in the pursuit of this aim.

Teacher 2's primary concern was to provide students with access to a broad spectrum of viewpoints, even to the extent that her classroom environment reflected a range of views through the posters, which were very carefully chosen with the concept of balance in mind:

> "When I first came to school I was even dubious about putting things up like Oxfam posters (about) what we should do to help people and how responsible we are for poverty. Because if you spoke to someone like my Dad, he would probably say, 'no, that's not true'. And now I would put them up with other things as well just so that they would see a spectrum of opinion .." (CS2: T3 595-601)

This teacher's thinking about her classroom environment appears to reflect the influence of her concern about how outsiders might view her teaching, and she noted

that the response from other teachers, parents, or governors was likely to be highly critical if a one-sided approach was adopted (see later). Therefore, central to her beliefs about teaching controversial environmental issues, was the aim of presenting students with a multitude of different viewpoints about each issue. She liked to use role plays, she said, because in this way she was, ".. forcing more points of view to be said" (CS2: T2 78), and she wanted students to be aware of, ".. all the different permutations of opinions" (CS2: T3 439-40).

Teacher 3 was also keen to present a range of different viewpoints to the students, but he particularly emphasised the need to assess and evaluate those viewpoints:

> "... what I specifically wanted them to do was to think how they could evaluate opinions numerically so that they could come up with some kind of evaluation .." (CS3: T2 45-7)

From his perspective, it was important for students to be able to consider different points of view and then come to a decision about, "the best way forward" (CS3: T2 47), based on some kind of objective evaluation of the arguments:

> "I'd like to have talked in terms of impacts being positive and negative, and the impacts being ... environmental, social and economic (so) they could identify for those three key words, what would be for example, the major positive and the major negative values, to get some idea of balance. And then possibly even to give some numerical value to those, some kind of costing, negative, positive cost benefit analysis." (CS3: T2 117-25)

He saw such analysis of different viewpoints as a useful skill for the students to acquire because it was, ".. what they'll need to do for the decision-making paper" (CS3: T2 81), and also because of its potential importance for their individual study:

> "I think in those individual studies they're going to meet a range of people who are going to have different viewpoints, therefore any kind of work we can do now which starts them thinking in terms of ... I've got an issue, how can we resolve this difference of opinion?" (CS3: T2 260-3)

From the discussion above it can be seen that whilst the three teachers, at a superficial level, shared a conception of balance as requiring the consideration of more than one viewpoint, the function which balance served in each of their teaching was distinctly different. Teacher 1 used balance as a method of challenging the perceived simplistic views of the students or of text books; teacher 2 saw balance as the justification for supplying as wide a range of viewpoints as possible; and teacher 3 viewed balance largely in terms of encouraging students to evaluate different opinions for the purposes of course work and exams. However, there was more solid agreement about the second aspect of balance, as discussed below.

The second aspect of the teachers' understanding of balance entailed a belief that they, as teachers, should not impose their own views onto their students. They felt that the students might be overly influenced if the teachers supported one particular point of view, and all three teachers were wary of even stating their own views in lessons apparently because of an underlying fear of indoctrination:

> "I try to take a fairly balanced view ... I think it's important to give a balanced view and I'm not out there to turn them into green, banner-waving fundamentalist environmentalists ... They've got to come to it themselves, I don't think we should be imposing our views on them. I don't think that's my role .. I definitely don't see that as my role." (CS1: T2 352-9)

> ".. that's not your job, you know. I don't think you should be telling them what to think. I think because you are a teacher then you may have some influence on them, and therefore you shouldn't be using it to say, 'this is what I think. Do it this way.'" (CS2: T2 408-11)

> "I don't want to sort of prejudge the situation. I want them to come to their own viewpoints. And if they've exchanged their viewpoints and they've said what their viewpoints are, erm, I might well say 'well that's interesting, now my viewpoint is ... But no, I haven't stood up and banged a gong and said ... 'this is what I firmly believe'." (CS3: T2 483-89)

Teacher 3 admitted he was "reluctant" to state his own viewpoint but, if pressed, that he might provide it "at the end" of a discussion (CS3: 471/481), a stance with which teacher 2 agreed. All of the teachers felt that students should be encouraged to, "make their own decisions" (CS2: T1 57-8) about controversial issues, and they believed that stating their own views might limit the range of responses which students felt to be appropriate. Teacher 1 commented that the students were in a, "very formative part of their development", and teacher 2 noted that some students seemed to deliberately express attitudes with which they thought the teacher would agree - and that others could be "particularly reactionary", in an attempt to elicit a response.

All three teachers aimed to encourage the students to state their own views, to question those views, and to think about alternative perspectives, but they aimed to question students with differing views equally, rather than to offer support to one side of the argument or another:

> "I'm not there to indoctrinate them in a particular view, I'm there to open their eyes and get them to look at lots of different issues ... and come out with what's right for them." (CS1: T2 321-5)

> "And it's quite good to actually see what they do think, you know. How many of you do think ..? You know, sometimes I'm asking those questions 'cause I want to know what they do think about it." (CS2 PP 4/3/97)

> "I didn't want to get too involved and I didn't want to direct ... discussion in a certain direction." (CS3: T2 457-9)

The stance chosen by these teachers appears similar to that of the 'neutral teacher' advocated by the Humanities Curriculum Project (see chapter 2), and teacher 3 explicitly stated at one point that he hoped he had "demonstrated neutrality" in his previous lesson.

These teachers' advocacy of questioning students rather than stating their own views also appeared to be linked to more general pedagogical beliefs, particularly the use of an 'enquiry approach' which is a prevailing theme in the 16-19 syllabus. A key aspect of the teachers' understanding of the enquiry approach involved the strategy of questioning students to encourage them to think about solutions to problems, rather than simply providing all the answers:

> "Through enquiry ... I think there's a lot of value in what students find out for themselves rather than just being told by us. If we tell them too much, it just goes in one ear and out the other and they're sitting thinking about something else, they're not actively involved." (CS1: T3 208-11)

> "The idea is that you are not dictating to them ... you're doing lots of brainstorming, you're asking them questions ... rather than just saying to them, 'here's a sheet, these are all the different management strategies' ... Obviously they've got to get content down in the end, they've got to get down how it was actually done. But, you know, getting them to think about it and assess what they think, assess perhaps that type of management strategy." (CS2: T3 357-70)

> "I wanted them to think it through for themselves. I wanted them to go through the process of trying to make the links ..." (CS3: T1 157-8)

The enquiry approach values *asking*, rather than *telling* students about issues therefore, on the face of it, it appears a useful tool with which to engage students in thinking about controversial environmental issues. (However, there is evidence that some of the questions used by the teachers were rather less open than might be expected - see section 5.4 and next chapter).

Nonetheless, all three teachers felt that using the enquiry approach had considerable advantages over a more traditional, lecture-style format in which the teacher's role is to impart information for the students to learn:

> "If I lead them by the hand all the way through, they'll never become independent learners." (CS1: T1 232-3)

> "I think generally it's a brilliant idea, this whole questioning is the way that you should be teaching anyway and I think a lot of teachers perhaps are naturally teaching in that style anyway. And I think in geography it's important ... 'cause if you were employed in anything in that sphere, that's what you would be doing ... So the onus is on them, and I think whenever the ideas come from them, they're much better understood." (CS2: T3 375-85)

> "I just do feel that with the flow of the lesson as they were, it was a really good opportunity for them to be more responsible for the work. And if we constantly take away that responsibility, then we're gonna be in difficulties." (CS3: T2 220-23)

However, teacher 1 felt that it was important that it was carried out within a strong framework to prevent students from getting lost:

> ".. by giving them fairly constrained, specific things to look for, and a reasonable amount of direction as to where they could get information ..." (CS1: T3 16-17)

> "(The 16-19 teacher's file) still says, 'are you an enquiry teacher?' And I glanced through it and thought, 'well .. about 60%'. But if I'd been 100%, I don't think I'd be as good a teacher ... Because I think it is great for really able kids, (but for the D and E grades) you could be in danger of dropping them off the bottom." (CS1: T1 402-12)

Teacher 2 also felt that there were limitations on the use of the enquiry approach, due to the sheer amount of content that had to be covered in the A level syllabus:

> "You can't always be questioning them, sometimes you've just got a bulk of content ... and sometimes they've just got to sit down and take notes ... But ultimately in the end they will get down information and they'll probably be told a lot of views from text books and stuff ..." (CS2: T3 372-95)

In line with the use of the enquiry approach, the teachers also shared the aim of enabling students to make their own decisions about controversial environmental issues. Reasons provided for this stance included respect for sixth formers' understanding and views; fear of external judgement by parents or teachers; and mistrust of people who held strong views and attempted to enforce them on others. Of the two central aims in the environmental education literature (promoting environmental attitudes and developing independence), teacher 1 expressed a clear belief that it was much more important that students should make independent decisions, than that they should be encouraged to be concerned about the environment:

> "I think they're quite capable of thinking for themselves ... you can't have independence of thought if you then want to determine and define their attitudes. So, I think I would go for the independence of thought first, and if you are going to really respect that and you mean that, then you can't say that you're going to promote positive attitudes." (CS1: T3 476-81)

Teachers 2 and 3 agreed with these sentiments, and both stated that - even if they disagreed with the students - they would avoid telling them that their views were wrong.

> "I'd never say, for example - well I hope I'd never say - 'well you know, that's wrong!' I'd say 'well I don't have much sympathy', or 'I do not myself agree necessarily with what you're saying, we may beg to differ on that' ..." (CS3: T2 541-3)

Teacher 2, especially, felt that the students were often well informed about environmental issues and that they, as teachers, could never be certain about what was right and what was wrong.

All three teachers believed that their job was to provide information, rather than to change the students' attitudes. Teacher 2 in particular, suggested that imposing her own views on the students might lead to serious repercussions:

> "You could get into serious trouble ... with their parents because, like I say, it's not your job to say how they live, it's your job just to make them more aware and to give them ideas, and to give them knowledge of what is going on." (CS2: T3 589-95)

Moreover, to some extent, all of the teachers extended their concerns about expressing commitment to other people who held strong beliefs, finding students with strong viewpoints (usually interpreted as 'fixed' viewpoints) problematic (see section 5.5). They felt that it was important to be able to consider other points of view, and were suspicious of people who did not. Therefore, in their own teaching, they tried to be open to different viewpoints as much as possible:

> "Maybe the reason I don't use a committed approach is that I'm somewhat wary about people who have fairly dogmatic views, and state them without perhaps having thought through the issues first." (CS3: T2 502-4)

To avoid imposing their own views, teachers 2 and 3 both felt that their ideal role in lessons would be to do nothing, and let the students discuss the issues, especially in a role play, where it should be possible for the students themselves to present a range of opinions and discuss them together:

> "I mean in this case ideally my role would be to do absolutely nothing and Louisa would be completely controlling it, and making sure that one person at a time spoke and also putting food for thought in." (CS2: T2 211-3)

> "I thought they showed maturity in the way they went about it, and I didn't feel there was any need to interject ... I'd always made up in my mind that I would hold back." (CS3: T2 189-92)

Their aim was to let the students talk amongst themselves and express different opinions, arguing amongst each other. However, the teachers did encounter problems in trying to enact this strategy in practice (see 5.5). These issues will be discussed further in relation to the environmental education literature in chapter 7.

5.3 Why is balance important?

As well as being a counter to potential threats of indoctrination, there appeared to be several reasons why the teachers in this study valued balance as a strategy for teaching about controversial environmental issues. The first reason was related to a perceived need for the students to be made aware of a variety of different, sometimes conflicting, values for the purposes of success in the examination:

> "Because, at the end of the day, we want them to be able to make decisions, we ultimately lead into the decision-making exercise, I think the process of understanding what the issues are ... is actually very important." (CS1: T1 390-2)

> "I think it's .. from exam reasons they have to be aware of all the arguments. If they're gonna write in an argumentative way, they have to be aware of what they are .." (CS2: T1 125-7)

> "They need to be able to identify different groups, how these different groups are constituted, what are likely to be the viewpoints of those. So that when they're coming to look at management plans ... they're understanding, OK well how will these groups react in turn to those proposals. It's a theme that runs through all the decision making papers and it is very important that they look at that." (CS3: T1 423-428)

The decision-making paper was mentioned a number of times in this context as requiring the students to analyse different opinions and suggest possible management plans, taking these into account. For this reason, it was argued, students needed to be aware of a range of different views about an issue, and be able to discuss them. Teachers 1 and 3 both noted that the 16-19 syllabus paid particular attention to looking at attitudes and values, and that considering different views was therefore an important skill required by the students:

> ".. looking at other people's values and looking at different value systems and different cultures is still there (in 16-19) ... I think to some extent it's probably there more than it would be in a traditional A level because the people aspect takes a higher profile." (CS1: T3 411-22)

> "(We need to look at conflicting viewpoints because) ... the bread and butter stuff is the exam, and I've got to make sure they're a hundred percent prepared for the exam, and I do think this syllabus is very good at highlighting these kinds of issues." (CS3: T2 257-74)

The syllabus demands may also explain teacher 3's focus on evaluating different opinions in an objective manner, since he argued that this was, "how most decision making papers work". A typical paper might include a list of the attitudes of people affected by an issue, and ask the students to come to a decision, taking due consideration of those differing views.

The second reason given for valuing balance was that the teachers felt that considering a range of opinions was a useful skill which would enable students to

analyse issues outside of school. The teachers hoped that students would complete the course having a deeper and more balanced understanding of environmental issues than the view they perhaps might have got from television programmes or environmental organisations:

> "I think the media influences them an awful lot, and they've got to realise that the diet they get from the media is highly selective ... pressure groups influence them and they are coming from a very particular point of view ... They should be able to analyse where people are coming from and appreciate people's motives, and that will give them a better view." (CS1: T2 344-50)

> ".. the decision making paper ... is getting you to come up with some answer, some plan and actually justify why you've chosen that plan. And I think that's something that practically you may do quite a lot in the real world ... It's the only thing that really is probably going to explain to them why we've got rich and poor countries in the world ... and why certain countries are experiencing famine, which they see on TV all the time.." (CS2: T3 248-58)

> " ... my viewpoint is that whether they go in to do the exams and whether they pass or fail, they're gonna be geographers, they're going out into the real world where there will be situations and I'm hopefully raising their awareness that there are many issues outside of this classroom ... It would be nice to think that they leave school with a wider understanding of the range of issues that are out there." (CS3: T2 257-74)

By taking a balanced view, the teachers aimed to encourage students to look at issues from a new perspective which would give them a more realistic understanding. They felt that it was very important to encourage students to understand issues from someone else's position and to empathise with other people who might have different views:

> "I'd like him to start thinking through how you respond ... if you're a have-not, instead of a have." (CS1: T1 287-9)

> "... empathising with other countries' situations, or other people's opinions. If you're making them see it from someone else's view." (CS2: T2 75-8)

> "16-19 is very much about environmental issues, and you are frequently being given the opportunity to empathise with different people and to understand their viewpoints. And that's a really important skill I think that they need to develop." (CS3: T1 420-22)

As well as empathy, these statements illustrate the teachers' support for the liberal value of tolerance, a guiding principle behind the neutral teacher role. However, ironically, in an attempt to encourage tolerance for others' views, the teachers appeared to move further away from their initial view of the neutral teacher role (see section 5.4).

A final reason for adopting a balanced approach - mentioned by teacher 2 - was that A level students would be highly aware of any tendency towards bias, and would not allow the teacher to espouse a one-sided view unchallenged:

> "The chances are, you can't pull the wool over their eyes at A level, they're gonna turn to you - someone like Paul will turn to you and say, 'no, they should do this', you know, so .. even though he doesn't believe in it at all!" (CS2: T1 130-33)

This teacher felt that some students would play "devil's advocate", even if they agreed with the view being presented, if they felt that it was being given unfair coverage. However, it seems that she did not feel that all the students would be so discerning, since she was nonetheless concerned about issues of indoctrination.

5.4 How to achieve balance

These teachers mentioned several key teaching strategies for achieving and maintaining balance in their teaching. Apart from those discussed in section 5.2, namely the choice of activities and resources for the lessons and the use of an enquiry-led approach, the teachers also described a number of different approaches by which they tried to achieve balance in classroom discussions about controversial environmental issues. Whilst all three teachers had firmly agreed that their role was not to *change* students' attitudes, they nonetheless felt that it was important to *challenge* students' attitudes on some occasions, in the interests of encouraging them to think more deeply and consider wider views:

> "It's just making them question what they're thinking, it's making them think further than perhaps they're thinking at that time. They may have a certain point of view, you're saying, 'yeah but what about this?', and it may be 'oh well I never thought of that factor before', or it may be that they are arguing from one point of view and then I say 'well what about this?' and they say, 'yeah, but I also think this', and they can back that up as well. So it either reasserts their ideas or it makes them question them." (CS2: T2 476-82)

This subtle distinction between 'changing' and 'challenging' views was very important to the teachers, enabling them to question students' initial views but without conceptualising this as an attempt to persuade the students to change their minds. This particular interpretation of balance enabled the teachers to extend students' views, and to encourage them to think about issues from another person's perspective. However, it is far from the neutral role which the teachers initially appeared to be advocating, with balance now being viewed in terms of the whole lesson, encompassing both the teacher's and the students' comments.

Teachers 1 and 3 both felt that the students sometimes had rather simplistic attitudes about issues, which were not supported by evidence, therefore they felt that it was important to challenge students to justify their views and to think about the implications of their views:

> "I think there are times when they come up with fairly simple statements and never go beyond those simple statements, and what I'm desperately anxious for them to do is to take the line of thinking and to explore it." (CS3: T1 283-5)

> "I wanted them to be able to evidence their opinions. They couldn't evidence catching pigs from the forest (but) there was evidence that there was husbandry going on ... Opinions based on knowledge, and being able to evidence them in case studies. That's really what I'm working towards now." (CS1: T1 361-9)

These teachers again related their position back to the aims in the syllabus, and the importance of the examinations. Teacher 1 felt that one problem with the initial 16-19 syllabus was that students had, "opinions about everything and knew nothing" (T1 359-60), but felt that this had improved with syllabus changes, and teacher 3 said that it was now very clear that students had to, "justify their viewpoints" (T1 336-7).

Again, the teachers were keen for the students to empathise with other peoples and lifestyles, and both teachers 1 and 3 felt that students could be very judgmental about environmental issues, failing to understand the position of others who are less well-off than themselves:

> "I think we're all very good at saying, 'we mustn't use the forests, we must keep them pristine and as they are because they're so important and valuable to the world.' And they're millions of miles away from us ... but we really value them .. which is easy to say when you've got a full tummy and you're rich and you've just been driven to school by mum in the car .." (CS1: T2 398- 403)

> "But a number of them do tend to make judgements about deforestation and 'this is all the fault of third world countries, blah blah blah', and I don't think they think enough about the changes that have happened in our own landscape." (CS3: T1 267-70)

These teachers felt that the students' lack of experience with other cultures made it difficult for them to understand the problems of disadvantaged peoples, and felt that the tendency of schools to teach environmental problems in a third world context led to the view that, "it's always a problem that other people are involved in" (CS3: T1 260-61):

> "They always think that forest exploitation and deforestation is just a developing country problem." (CS1: T2 28-9)

Therefore, in the context of western schooling, these teachers felt that it was important to ensure that the voice of other nations could be heard.

In order to counter students' perceived preconceptions and fixed attitudes about environmental issues, two of the teachers primarily used questions to challenge the students to think more about their views. Teacher 3 explained his use of questioning as challenging students to justify their viewpoints, and to explain why they hold those views. In this way, he suggested, the students could be encouraged to think about other possible views of the issue:

> "I was just being provocative! ... I mean you could just say it's challenging, it's challenging in a way that I feel comfortable with, with some of the people in the group ... It's challenging them to take that sort of initial view that they have and, and making more of it." (CS3: T1 280-98)

This teacher used a similar strategy during a role play, when he felt that one of the groups had not been sufficiently challenged to justify their viewpoints. He used questions here in quite a confrontational way, describing their purpose as to elicit a brief response from the student concerned:

> "I was trying to, almost like a barrister in a way, I just wanted a very quick sort of adversarial comment ... I just wanted to put her really on the spot and challenge her." (CS3: T2 153-6)

Teacher 2 also found questions extremely useful to balance discussions which might otherwise have been dominated by the more argumentative students:

> "I think by this stage Paul and Jake were very dominant in the group and they were very very confident of their views ... And I think my role there was to actually question some of what they were saying and not just be completely phased by how strong they were feeling about it, like some of the other students might have been .." (CS2: T2 466-70)

It was necessary for her to intervene in this case because the two students mentioned were dominating the argument, leaving the opposing view largely un-stated, since other students were unwilling to take on their articulate and apparently knowledgeable opponents. (This can be seen clearly in the lesson data portrayed in the following chapter). In order to achieve balance therefore, this teacher found it necessary to take part in the discussion to enable opposing views to be heard. She believed that using questions was more appropriate than directly stating an opposing view, since it was a less confrontational approach, and she did not want to get involved in arguing with students:

> "I don't want them to leave thinking that they've had a personal argument with me. I want them to leave thinking that they've had an argument with the others and that perhaps I've put other ideas into their head - or made them think of other things." (CS2: T2 431-4)

She felt that it was important that she should not be seen to be taking sides in the argument, since, "you don't want them to think that you don't think their ideas are creditable (sic)" (CS2: T2 439-40).

In case study 1, the teacher used a different approach to challenge the students' attitudes. She felt that it was necessary to provide a more direct challenge to their views, and argued that to achieve balance she sometimes had to impose her own views to counteract the prejudices of the students:

> "I was imposing my values because they were failing to value the Maring people weren't they? And that made me a little bit cross .." (CS1: T3 586-88)
>
> "I think I was imposing balance on that because they were shifting along a prejudice route, they were becoming quite prejudiced, so I imposed my views there just to counteract their unintentional prejudices." (CS1: T3 606-8)

It is at this point that the definition of balance becomes most blurred. Having stated that a balanced view did not entail, "imposing our views on them" (see section 5.2), this teacher then apparently contradicted her stance by arguing that she, "imposed her views" in order to impose balance (see above). A possible explanation for this contradiction is that the nature of the subject matter prompted the change in her conception of balance. Although these statements appear to present a much stronger stand than that taken by teachers 2 and 3, there was evidence that these teachers would also take a harder line on some issues, such as racism (see section 5.6). In the context of the above remarks, teacher 1 clearly felt that some of the students were expressing racial prejudice against indigenous people, and this seems to have brought into play an alternative conception of balance which was somewhat at odds with her original interpretation.

A final strategy, mentioned by both teachers 2 and 3, was that of controlling the discussion by drawing in opposing arguments from other students in the group. This strategy might involve encouraging students who were expressing views which differed from the majority, or opening up the discussion to other views, by explicitly asking the class for alternative opinions:

> "I wanted to give Justine a chance to have her say. And because she was the only person that said 'no', I wanted to be sure that people weren't gonna kind of turn round and say, 'no!' And so that's why I made a point of saying 'yes, I think that's a good point', and of prompting her further." (CS2: T3 125-8)
>
> "I would probably just keep questioning them, and questioning them ... And if they just kept coming back at me, I'd just be like, 'well OK, fair enough, what do the rest of you think', and open it up to the group, you know. So they would at least be aware that other people felt differently." (CS2: T3 569-74)

> "I felt that he might well have missed the point on that. And therefore (laughs) I deliberately steered it back rather naughtily and said something like, 'does anybody take a different view about residents?' ... I suppose I was deliberately manipulating the conversation to come back to anybody else who sees residents in a way that is other than local farmers ... I wasn't trying to shoot Mark down, I was offering somebody else an opportunity to define local residents in a way which was different from Mark's view." (CS3: T1 354-78)

By using this strategy, these teachers aimed to produce a dissenting voice alongside the prevailing view, but without having to become personally involved in the discussion.

5.5 Problems with balance

The teachers perceived a number of problems with trying to maintain balance, both in terms of their attempts to challenge students' views, and also with the management of student discussions. All three teachers mentioned as a potential problem the fact that some students came to the lessons already with very fixed views, and found it difficult to consider any other opinions. The teachers felt that it was important for students to at least consider alternative positions:

> "I think there's a danger that they (may) become totally disempowered ... If you become very polarised either way, the danger is that ultimately you become demoralised. I want them to understand that lots of life's a compromise and you might sometimes compromise your views because you've taken other things on board and perhaps taken a wider view of what's going on." (CS1: T2 314-20)

> "(The only difficulties) are the ones that are completely intransigent and not really able to consider any other viewpoint other than their own. And that's sometimes very difficult to break down. And it's not often but every now and then you get somebody who says, 'well I still think this should happen', and that's fair enough. The majority of people can see that there's this viewpoint and there's that viewpoint." (CS3: T2 533-37)

> "I'd probably just keep questioning them ... So perhaps then in that respect I'd be pushing them more for answers. But that'd only be because I'd think that they'd be ignorant to have that strong an attitude .." (CS2: T3 569-76)

Teacher 2 described some of the students in her class as being 'stubborn' and 'absolute' in their refusal to consider different perspectives. It was clear that the teachers saw students with strong opinions as problematic, and both teachers 1 and 2 became frustrated, on occasions, by the inability of individual students to see issues from any viewpoint other than their own:

> "I wasn't irritated, well no, maybe I was a bit actually ... they were quite stubborn in their, 'no, it's not a problem' ... very kind of absolute." (CS2: T1418-23)

> "And that's why I was cross with him in a way ... And I think it's OK to be cross with him, you know. I thought it was an unbelievable statement, 'cause he just said 'oh well, if you're the weakest, you lose out, and the strongest can take what there is', that was on the land issue again, wasn't it? (CS1: T1 270-74

Teacher 1 felt that some of the problems which she had encountered in this vein were due to the simplistic teaching that had taken place lower down the school, as well as information about the environment which students had gleaned from outside school, all of which made it very difficult to overcome students' initial views:

> "Because we'd done shifting cultivation as a way of living in harmony with the forest, (they thought) 'oh isn't that wonderful', but they couldn't grasp the idea that ... indigenous people can actually damage the forest." (CS1: T1 13-17)

She felt that once students had taken on board a particular view of an issue, then it was very difficult to challenge them to think more deeply about some of the complexities involved.

The stance of neutrality, or non-involvement, advocated by teachers 2 and 3 also caused a number of problems. Both teachers had suggested that it would be ideal to let students control the discussion, express their own views, and argue amongst themselves - at least in some situations (see section 5.2) - but found that this was difficult to maintain in practice, noting that they sometimes got more involved in discussions than they had intended:

> "I think the second time we did the role play I was much more interjecting all the time, partly because I don't think Louisa was feeling very well so she wasn't quite as forthright as normal. And also 'cause they were more argumentative, and so you have got that kind of crossover of how much am I putting my own point of view across and how much am I actually just giving them food for thought." (CS2: T2 216-221)

> "The other thing is sometimes I get more involved than I should be and I need just to step back and to let them take over. It's their ideas, not my ideas, and I'm only prompting discussion like I did with that question - I prompted a line of debate - it's not, for me, necessary to lead that." (CS3: T2 185-9)

A number of possible explanations could be suggested for the difficulties which the teachers experienced. Firstly, according to teacher 2, the students often had very similar views so, without involvement from the teacher, the discussion could remain very much in the same area, and differing perspectives would not be considered in any great detail:

> "(In) a discussion, unless you're very pointed with your questions - which you hopefully would be - and you've got very diverse characters within the group, you can still stay in the same area discussing the same kind of thing, whereas a role play, I write a little bit down, they've seen that, they know what area they've got to look at, and there's lots of different opinions will hopefully be coming out." (CS2: T2 78-83)

She felt that allocating different perspectives to students via a role play could overcome this problem to some extent, but even in a role play - as noted earlier - there was sometimes a tendency for a small number of students to dominate the argument with strident, carefully articulated views, which might have remained unchallenged were it not for the teacher's intervention (see section 5.4). This teacher also felt that there was a tendency for students to get carried away with the argument if they were left alone with little input from the teacher:

> "...when they do get to that stage where they're really arguing, and they do really feel argumentative inside, they're not just putting on an act, it gets quite difficult to get them to start listening to each other ... stopping and listening and waiting until that person's finished speaking." (CS2: T2 149-53)

Therefore, these teachers felt that to achieve balance, they often had to intervene more in the discussion or role play than they would ideally have preferred.

5.6 What might temper beliefs about balance?

As has been shown in the discussion above, one of the teachers' main aims in teaching about controversial issues was to try and maintain balance, and encourage students to consider differing viewpoints. However, there were some issues about which they felt that a strategy of balance was not necessarily the most appropriate. The most obvious exception was in regard to racism or racial prejudice. This was exemplified by teacher 1, in her teaching about indigenous people, in which she clearly saw some of the views expressed as unacceptable:

> "I felt he was trying to say, 'well OK then, winner takes all', which is an attitude that I come across quite a lot in this school, you know, 'fine, well if they've got it, they won it, and they keep it and it's tough if you're one of the losers' ... and I just thought, this is so trite, this is so out of order, and that's how people have become disaffected." (CS1: T1 254-60)

In this example, the teacher described her role as "imposing balance", but she clearly felt that this student's view of the issue was not one which deserved serious attention, and that the "prejudiced" views of some of the students should be challenged. Both teachers 2 and 3, when talking about racism in school, agreed that racist views would not be tolerated in their classrooms and that this was one situation where taking a balanced view would be inappropriate:

> "It's like if you had someone who was openly racist in your group, you wouldn't ever allow that to go ahead .." (CS2: T3 485-7)

> "One of the things that I would commit myself to at some point is a viewpoint about my feelings of racism. So I would be very dogmatic in what I say about I will accept no racist comments and on this I am absolutely firm." (CS3: T2 450-68)

Another issue impinging upon the teachers' ideas about balance was the need to provide evidence for opinions or viewpoints. They believed in the importance of providing access to a variety of different views, but all views were not held to be equally valid - those supported by more evidence were given greater value. This evaluation held true for points of view put forward by the students, as explained by teacher 1:

> ".. we want them to be able to make decisions ... Everything they should be judging now should be judged on knowledge that is evidenced. And understanding that is evidenced as well." (CS1: T1 390-95)

It also applied to points of view put forward by the teacher, according to teacher 2, who would be less forceful about presenting an argument if she could not provide supporting evidence to back it up:

> "I think if I'd have had the evidence there and then (I might have said more). But I couldn't have that specific information, so the only thing that I really said was about 'isn't it contained in Sellafield ...?' Whether or not, if I'd had the information to say, 'actually they have found this in Antarctica', I don't know because all of them were quite open-ended at that point." (CS2: T1 436-44)

The importance of providing evidence for a viewpoint was mentioned by all the teachers on a number of occasions, suggesting that, as well as racist views being unacceptable, views which could not be supported by evidence were given less weight in the classroom discussions.

A third issue which teachers 2 and 3 described as in some way tempering the ideal of balanced teaching, was the classroom reality which affected their interactive decisions. Teacher 2 explained that she had many - sometimes conflicting - aims when she was teaching, and balance did not always take top priority:

> "I think my role should be to provide food for thought, and certainly I wanted them ... to come out with the things about that you need to monitor ... So whenever those opportunities came, I will say something which emphasises this whole point ... I think it's basically to control it - which doesn't always go particularly brilliantly! And to also steer it so that they're getting the key ideas I want from it ... and to stop things becoming too personal ... And also to try and encourage everyone to speak (but) if they're not that confident then they don't really want you to keep picking on them .." (CS2: T2 219-40)

This comment illustrates the variety of different issues which teachers might have to take into consideration when teaching a lesson. For example, one major reason for intervention in discussions was the need to complete a prescribed syllabus. The teachers had planned their lessons with a certain outcome in mind, which might be to

demonstrate a key idea from the syllabus, and it was important that the students should understand the issue in the light of this key idea. Enabling access to a very wide variety of opinions might detract from the point which the lesson was intending to demonstrate, and thereby lead to confusion or misunderstanding by the students. The syllabus also imposed on teachers a constant awareness of time constraints, which meant that becoming too deeply involved in all the possible different views of an issue was often not practical:

> "I think sometimes I don't allow sufficient opportunities for them to express their ideas as openly as possible. And I think part of me says, I've got a syllabus to get through, I need to spend only X amount of time on this, and I've gotta go, 'bang, bang, bang!'. I can see where I'm wanting to get to, and I can see where the line of work may be going." (CS3: T2 185-200)

Therefore, there are a number of reasons why the teachers' practices might differ from their expressed beliefs about providing balance. These issues will be discussed further in chapter 7.

5.7 Conclusions

This chapter illustrates the problematic nature of the understanding of balance articulated by these teachers. The three teachers showed general agreement about the desirability of presenting a balanced picture, but nonetheless differed considerably in their reasons for valuing balance and their methods for implementing a balanced approach. Although the teachers all spoke in terms of 'balance', their stance of non-involvement is clearly influenced by the 'neutral teacher' role as described in chapter 2, and many of the problems they identify with this approach are similar to those observed by teachers implementing the Humanities Curriculum Project. Moreover, these teachers also apparently support the use of a type of 'devil's advocate' role, in their description of 'challenging' students' views. This suggests that the distinctions between the various roles are not as clear-cut as the literature might suggest. However, notably, the one role the teachers do not support is that of the 'committed teacher' - despite the fact that this is arguably closest to the expressed aims of the environmental education literature.

This account shows that the teachers share a fairly coherent view of what providing balance entails: All three teachers agreed that they should provide access to more than one view of an issue (although apparently for different reasons), and that students should be encouraged to make their own decisions about controversial environmental issues. All three also believed that they should not impose their own opinions upon the students, and often tried to avoid stating any opinion themselves, for fear of

influencing the students' views. These conflicting demands became problematic if the students were in agreement with each other, thereby reaching a premature consensus on the issue, or if the discussion was dominated by one or two students only. In these situations, lacking teacher involvement, no dissenting voice would have been raised. The teachers therefore have the potential dilemma of wanting to articulate divergent opinions, but not wishing to express any argument themselves. This dilemma appears to be a key guiding factor in their selection of teaching strategies, which will be discussed in the next chapter.

A number of other factors are identified in this chapter which might influence the teachers' use of balance as a teaching strategy for controversial environmental issues. These include the syllabus and examinations, the influence of which could be seen very clearly throughout the interviews with the teachers. The syllabus guides teachers to present issues from a variety of different perspectives by requiring that students take account of differing attitudes for the purposes of the examination, and explicitly encourages independent decision-making by the inclusion of a decision-making paper. However, the syllabus can also be seen as a constraint on these teachers, who are aware that students require large quantities of factual information, which seems to them to require a teacher-directed approach. The syllabus can therefore confront teachers with problems due to lack of time, forcing them to teach in a more didactic style than they would prefer. Use of the enquiry approach, also advocated by the 16-19 syllabus, appears to have the potential for aiding balanced teaching, encouraging the teachers to use a questioning style and inviting independent decision-making. However, there are some indications that these teachers did not always use questioning to encourage students in a free expression of their views, since there is talk of an 'adversarial' approach, which has the aim of eliciting a brief response, rather than encouraging the students to think too deeply about issues.

It also appears that the students themselves can become a source of bias in some situations if the teacher does not intervene. The teachers' ideal views about providing a balanced approach by allowing the students to discuss issues amongst themselves appear problematic when students are broadly in agreement with each other, or when one or two individuals dominate the discussion. For this reason, increased student involvement in the lessons does not always lead to increased balance. Finally, the specific topic which was being considered seemed to influence how the teachers viewed the strategy of balance. Teacher 1 appeared to contradict her initial stance that students should come to their own decisions about issues, by later admitting that she was 'imposing her values' on the students because their remarks demonstrated

prejudice. Furthermore, all three teachers felt that there were subjects about which a diversity of views would not be acceptable, racism being the primary example.

Because of these factors, it seems unlikely that the teachers' more idealistic views about balance will be consistently enacted in their classroom practice. The next chapter therefore explores some examples of the teachers' practices, and considers the ways in which their beliefs about balance are reflected in their teaching strategies. The issues, identified in this chapter, which might influence the teachers' use of balance as a teaching strategy for controversial environmental issues will also be considered in greater depth in the concluding chapter.

Chapter 6: Findings 2
The Teachers' Practices in Teaching Controversial Environmental Issues

6.1 Introduction

This chapter aims to provide answers to the second research question concerning the various ways in which the teachers' beliefs are enacted in their classroom practices (see chapter 2). In particular the chapter focuses on the key issue, identified in the conclusion to chapter 5, of how these teachers attempt to resolve the apparent dilemma of providing access to a diversity of views whilst at the same time avoiding stating opinions themselves or becoming actively involved in argument and debate. The analysis (phase 3, described in chapter 4), identified three main teaching strategies which the teachers used in order to enact their key beliefs, namely:

- Eliciting students' views (section 6.2)
- Enabling students to discuss their own views (section 6.3)
- Challenging students' views (section 6.4)

In this chapter, each of these strategies is discussed in turn, considering how it was used by the teachers, the students' perceptions of it, and its advantages and disadvantages. Similarities and differences between the three teachers are explored with reference to examples from their classroom practice[1] and extracts from student post-lesson interviews.

The final part of each section also considers the ways and extent to which each of the strategies may have helped to achieve the teachers' stated aims, as outlined in chapter 5. As well as detailed descriptions of the teachers' practices, this chapter aims to go further and begin to interpret these findings in the light of the relevant literature. It will draw on data from teacher and student interviews, on the lesson data itself, and on literature which may provide additional insights into the effects of using different teaching strategies. In so doing, the aim is to move towards a more theoretical level to provide a clearer understanding of the possibilities and problems with teaching controversial environmental issues (discussed further in chapter 7).

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[1] Full transcripts of the extracts from which these examples were taken are provided in appendix A3.

6.2 Eliciting students' views

6.2.1 Definition of the strategy

This strategy refers to occasions when the teacher deliberately elicits students' own viewpoints about an issue. These occasions fall into two main categories:

a) Open elicitation of views - The teacher may ask a question to the class which involves a value judgement. The students then respond by expressing their own opinions, and the teacher encourages the expression of a variety of views.

b) Closed elicitation of views - The teacher elicits a specific viewpoint, either by asking the students whether any of them holds an opposing view to one already stated, or by bringing in another student who is expected to disagree with a view already presented.

All three teachers used one or both of these strategies to some extent, often eliciting a range of student views with an open question at the start of a discussion.

6.2.2 Examples of the strategy in use

i) Case Study 1: Extract 2 (Open elicitation of views)

In this example, the teacher initiates a feedback discussion about a workshop at a rainforest conference that the students have attended by asking an open question:

1 T: Why do you think it was important to have a timber trade company there, B & Q there ..
2 giving us a feedback on .. giving a view on forestry?
3 Lisa: So it's not a one-sided thing
4 T: Yeah, it can't .. **what do you mean it's not one-sided?**
5 Lisa: Erm, then everyone being there that, they're trying to save the forest and not cut it down I
6 think.

The teacher's first question involves a value judgement - why was it important to have a timber company there? - thereby eliciting a view from one of the students, whom she then encourages to explain her response. In this case, the teacher does not continue this line of questioning to pursue other students' viewpoints, but instead moves on to present a strong argument herself, challenging the view that there is universal benefit in saving the rainforest (see section 6.4.2 number ii). This was the only occasion, in the lesson extracts studied, in which this teacher was found to use this strategy in her teaching and, even here, she only actually elicits the view of one student.

ii) Case Study 2: Extract 2 (Open elicitation of views)

A similar type of 'value question' is used by teacher 2 in the following extract, which occurs at the start of a discussion, this time about the role of non-government organisations in the control of decision-making about Antarctica:

1 T: OK, do you think, do you think that we can .. it is the sole responsibility of these different
2 states? What about NGOs, what about non-government organisations?
3 Dan: I think they should have a major say in it as well
4 T: Why?
5 Paul: Non-government, non-elected in other words?
6 Dan: Yeah, because they do sometimes have good qualities to point out
7 Paul: They're unelected though ..
8 Dan: (interrupting) Yeah, but often they're ...
9 T: Paul, Paul, make your point
10 Paul: People like Greenpeace aren't representation of a whole thing, they're not elected,
11 they're just a business.

This time, the opening question provoked a very long debate about the issue, with a great deal of student interaction. The teacher's involvement immediately after posing the question is focused on encouraging students to express or explain their views (lines 4 & 9), as she apparently attempts to take on the role of neutral chair (see chapter 2). She takes a similar stance later on in the extract (below), when the question is reiterated, and students are asked for a show of hands to demonstrate whether they agree or disagree:

72 How many of you feel .. let's do it right this time ..
73 How many of you do feel that it's a good thing that Greenpeace are kind of on the edge of all
74 of this? Put your hands up. (Dan, Jake, Lara, Vanessa, Jenni agree)
75 T: Paul's ... (laughs)
76 Jake: It's a good thing to have all these green things. They raise questions and make the public
77 aware and make sure that the er .. some of these things do .. But to give them as much power
78 as to have a huge right of say into something like this is ridiculous. It shouldn't be done!
79 T: Right so you ..?
80 Jake: You should have them lobbying on the outside instead.
81 T: OK, so that's what you think their role is? (yes) **And Paul what do you think of that?**
82 'Cause you were kind of 'no' (laughs).
83 Paul: Well they shouldn't have any power, obviously, but yeah they can express their feelings

The teacher's follow-up questions, directed at different students in turn, appear aimed at enabling a wide range of viewpoints to be aired, and encouraging all students who wish to, to explain and justify their opinions. This was a strategy frequently used by this teacher[2], often at the start of discussions. It differed from her more usual questioning approach in that there was apparently no expectation of a 'correct' answer being provided. Use of this strategy appears to reflect her desire not to get too involved in the discussions (see chapter 5), and provided her with a means of illuminating a diversity of views, all presented by the students themselves. However,

2 See case study 2, extract 1, lines 1-5 and case study 2, extract 3, lines 1-16 for other examples (Appendix A 3.4 and A3.6 respectively).

the difficulties of maintaining such a 'neutral' stance will be considered later (see section 6.4).

iii) Case Study 3: Extract 2 (Open elicitation of views)

In this extract, the third case study teacher uses a similar type of question, involving a value judgement, to elicit a student's viewpoint about the desirability of managing vegetation change around footpaths in the Lake District (lines 43-44; 46-47):

43 T: Yeah, I've rubbed it off. It's being changed. **Now the question is, if that were extensive**
44 over a large area, would you want to manage that degree of change?
45 George: If it was over a wide area, yes
46 T: Yes, and when you see pictures like that which could have been our footpath from the
47 Cevennes, what do you think you might be thinking about there? Has change gone too far?
48 George: Yes it has, because (unclear) I think
49 T: You think. That's your view. Right. What makes your view think that that is .. why do you
50 think that that is an area now that wants changing .. or managing?

Having elicited the student's view, he encourages him to explain why he holds that viewpoint (lines 49-50), and then goes on to challenge the student to justify his view (see section 6.4). However, although notionally seeking the student's opinion ('would you want to manage that degree of change?' - line 44), the teacher's questions in this part of the extract are leading (both apparently anticipating a positive response), therefore the actual likelihood of the student expressing his own views, if different, is low. This was not a strategy used frequently by this teacher, and this was the only example found in the extracts studied.

iv) Case Study 2: Extract 2 (Closed elicitation of views)

The earlier extract (ii above) from this discussion about the role of NGOs in governing Antarctica showed the teacher using questions to elicit a range of views from the students. However, later in the debate, the teacher has been providing more input into the discussion, arguing with Jake and Paul about whether Greenpeace, as an unelected body, should have any control in decision-making (see section 6.4). She appears to feel that she has been getting too involved in the debate so, in the following example, instead of replying to a point made by Paul, she draws in another student, Lara, to present the opposing view (line 220-221):

217 T: Isn't Greenpeace a world organisation, doesn't that have representatives..?
218 Paul: They're not elected, they're the minority of the people, and they're just a business like
219 any other (OK). They fund raise, they're not ...
220 T: Lara, do you agree with that? .. Do you think they can't be there because they're not
221 elected, they haven't been elected in their role?
222 Lara: I, yeah I do think they should be there
223 Paul: What? Well they don't represent the majority of the people. They shouldn't have any
224 power unless they're voted in
225 Lara: No, but a lot of people support them (laughter)

In this case, she is eliciting a specific view from a student whom she knows will present a dissenting voice, since she is aware from earlier discussion that Lara is in disagreement with Paul over this issue. Therefore, in this extract, the teacher uses both strategies in turn, both eliciting a range of opinions about an issue (open elicitation - example ii), and of eliciting a specific view from a student (closed elicitation - this example). A similar use of the strategy can be seen in another extract[3] where she again uses this approach to withdraw from a discussion in which she has been quite heavily involved.[4]

v) Case Study 3: Extract 3 (Closed elicitation of views)

In this extract, the teacher asks a question about which groups of people might hold conflicting opinions about land use in the British Lake District (lines 55-7). When one student (Mark) expresses his view about a possible conflict (lines 62-3), the teacher opens the question to other students to request an alternative opinion (lines 64-66):

55 T: Alright. Different groups. And you've recognised recreation and conservation. Would you
56 go as far as to say there are people there who might hold completely diverse opinions (yes),
57 and could you recognise who those people might be?
58 George: Erm .. local residents possibly and er .. the ramblers association
59 T: Right. Can anybody go forward? Can anybody .. so .. he says the ramblers association and
60 the local residents. Mark, you're going to be missing next week so let's test you while we
61 can - why do you think those are 2 diverse groups and what might their standpoints be?
62 Mark: Well quite a lot of local residents might be agricultural - farmers and er they might be
63 in conflict with the ramblers 'cause ramblers tend to walk through their farms
64 T: Yes - who else would agree with Mark that local residents can only be translated in that,
65 in that particular way? Who would take a contrary viewpoint? .. Anybody want to take a
66 contrary viewpoint? I'm not shooting Mark down I'm just ...
67 Julia: They may ... some of them may agree with the ramblers because they don't want to see
68 that area destroyed either.

This is an example of the teacher eliciting a specific viewpoint from a student - he explicitly requests a "contrary viewpoint" (lines 64-66), thereby producing a dissenting voice without having to express it himself.

6.2.3 Students' perceptions of the strategy

In general, the students were in favour of being encouraged to listen to other students' views, believing that they could learn from what other students had to say as well as by listening to the teacher:

S: I think it's nice to listen to other people's opinions and how they fit into your own or not .. (CS1 SA1 159-60)

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3 See case study 2, extract 3, line 125 (Appendix A3.6)

4 See also case study 2, extract 2, line 25 (Appendix A 3.5) for another example.

D: You do learn a lot more from what other people say (rather) than just sitting down and listening and writing down from a book. (CS2 D2 117-8)

S: I think it's best for him to push us to speak out and say our own opinions, 'cause it makes a good discussion and involvement, it's just not him saying, preaching in front of us which can become boring. (CS3 Sam 1 118-122)

However, some students did admit that they sometimes found it difficult to express their views in the lessons, thereby emphasising the importance of the teachers eliciting student comments. Students from all three case study classes felt that issues of time, and a prescribed syllabus sometimes meant that they did not get the opportunities to talk about their own views as much as they would like to:

A: It's difficult 'cause like in class you don't have time to actually listen to an explanation of everybody's opinion, and if you actually hear someone's opinion explained, it makes a lot more sense but you've only got time to say a few words, and it's on to the next bit .. (CS1 SA1 129-132)

D: This last module is all crammed into ten weeks and it's hard to actually explain in depth what we actually want to do and get our own viewpoints across. Maybe if the course was say 15, 20 weeks long, then we could expand more our own viewpoints ... That would be good because then we'd get a lot more understanding of what other people think and what's happening there. (CS2 Dan 1 240-7)

M: We don't get a whole lot of chances (to express our own views), it's usually opinions of the people in the areas that we study. We have to take up their opinions, so you don't usually get to put your own opinion in the class ... (CS3 Matthew 1 160-63)

Several students were aware that sometimes the teachers made deliberate attempts to encourage them to express their own views, or to elicit a specific view:

S: I think Mr **** was throwing points out to us and wanting us to quickfire response, probably just to broaden out on the short sentences that we said in order to see our opinions ... (CS3 Sam 1 102-4)

R: I think when we got to the end of everyone making their points, he came in, and I can't remember what he said, but I think he wanted people to sort of argue, and asked us if we had any more questions. I mean maybe he saw that there had been a couple of points that weren't drawn out from it. (CS3 Rufus 1 103-6)

However, one of the students also commented that what may appear to be an open-ended question may actually be the teacher's way of eliciting a pre-planned response, rather than a student's viewpoint:

H: He knew what he wanted us to say and he was just searching around until someone said it at the end really. He was leading us into it, making us think more - like he started off with a broad range of what the conflicts were and then he tried to narrow it down because I think he was leading to some key question or something at the end, about conflicts or something. And he knew what he wanted - he does this quite a lot - he knows what he wants us to say, but he won't say it, he works round it until we get it (laughs). (CS3 Hannah 1 98-104)

This comment was made in relation to example v) above, and reflects this student's view that when the teacher asked the initial, apparently open, question (about which groups might hold diverse opinions) he already had an answer in his mind which he was expecting from the students, hence his subsequent use of the closed elicitation ('who would take a contrary view?') to draw out this anticipated answer.

6.2.4 Advantages and disadvantages of the strategy

The strategy of 'open elicitation' was used by all three teachers, although its implementation and frequency was somewhat different in each case. This strategy provided one means by which these teachers could enable a diversity of viewpoints to be aired, by encouraging members of the class to state their own views about a controversial issue. Open elicitation was particularly significant in teacher 2's teaching, with students being encouraged to express a variety of views when she perceived an issue to be especially controversial, and when she wished to provoke a debate on a subject about which she anticipated that they would hold different opinions:

"I felt it was something that they would have views about, that it wouldn't just be an open shut, 'yes, well we think that's fine'." (CS2: T3 139-40)

Teachers 1 and 3 used this strategy less often, and in a more limited manner, to elicit the viewpoint of an individual student and encourage them to explain their position. This difference in use may reflect differences in the teachers' evaluations of the status of student knowledge and opinions about environmental issues. Teachers 1 and 3 both felt that students had rather 'simplistic' views about many environmental topics (see chapter 5), whilst teacher 2 felt that students (especially sixth formers) were generally 'very aware of current issues' (CS2 T1 210-1), and was often surprised by their high level of knowledge. The greater value placed by teacher 2 on the students' prior knowledge may have encouraged her to elicit their views more often than the other teachers.

A potential advantage of using the strategy of open elicitation is that the teachers can identify areas of misunderstanding or incomplete knowledge, and teach about these specific areas. They can also discover students' pre-existing views about an issue, and take these views into account in their teaching. This may entail ensuring that other views are given consideration - thereby enabling balance to be maintained by making a variety of perspectives available to the students, a strategy advocated by some literature on teaching controversial issues (ILEA, unpublished). For example, teacher 2 mentioned that she had not anticipated the wide range of opinions which emerged

when she elicited views on the role of NGOs in Antarctica, therefore she altered her teaching strategy somewhat because of a perceived need to challenge Jake and Paul's strong arguments:

"I was expecting 'oh yes, we think (Greenpeace) should be involved 'cause they're kind of overseers and they don't have their own gains to get out of it, they're doing it for the good of the land kind of thing. So I was really surprised when they came out with all the stuff about being non-elected which was brilliant, that they represent the minority which was interesting ... the darkened motives bit, and the whole idea of Greenpeace being a business and not having creditable scientists and stuff. That was really interesting, I thought." (CS2: T2 451-60)

Furthermore, in several cases, the strategy of open elicitation was followed by the teacher challenging the students' views. This suggests that the teachers aimed, firstly, to determine the nature of the students' views, and then to encourage them to think about and justify their opinions.

Environmental issues are subjects about which students may feel that they have considerable knowledge and well-formed opinions. This being so, they are more likely to feel that they have something to offer and wish to express their own views in lessons, than in more obviously 'academic' areas of the curriculum. The strategy of open elicitation may therefore help the teachers achieve their aims by enabling a diversity of views to be presented by the students themselves (if such a diversity is found in the class), thereby reducing the need for the teachers to present different viewpoints themselves. It also aids teachers in avoiding the charge of indoctrination which was a major concern to them, and which was particularly noted by teacher 2 (see chapter 5), perhaps suggesting another reason for her enthusiasm for this strategy.

However, potential problems with using open elicitation arise in cases where the students hold fairly similar views to one another, thereby limiting the diversity of responses which can be elicited from the group. In one extract from case study 2[5], there is a situation where only one student expresses an opposing view to the others, and the teacher has to work hard to encourage this student to explain her view. Another problem which was evident from case study 2 was the tendency for a small number of students to express their views forcefully, thereby discouraging other students from expressing contrary views. (This was also a problem in open discussions, considered below). That this teacher was aware of these potential problems is clear, and this may explain the use of other strategies which involved a greater level of intervention, such as challenging students' views:

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[5] Case Study 2, Extract 3, lines 7-14 Appendix A3.6

"I think generally they do tend to have fairly similar points of view, with perhaps the odd person that stands out, although it depends on the class ... The sixth form tend to be a little bit more conscious of what's going on and what's happening in the environment. But you still do tend to get a situation where the majority of the class will go the one way, and a couple of the people who are quite confident in what they feel - or feel particularly strongly about it - may speak up." (CS2 T2: 86-97)

Despite these potential problems, the student interview data suggests that the majority of students felt that they benefited from being able to hear others' views (see section 6.2.3).

A final limitation on the use of open elicitation was identified by the student in case study 3, who astutely observed that an apparently open question may mask the fact that the teacher has a specific answer in mind. Referring to the teacher's question in example v) (lines 55-7), she argues that the teacher was 'leading' students to his pre-planned answer, rather than genuinely enquiring about their own views of the situation (see also 6.2.2, example iii). Her interpretation is clearly supported by the teacher's account of this incident (cited in chapter 5), where he describes his actions as 'deliberately manipulating the conversation' because he felt that the first student had 'missed the point'. This emphasises the pedagogical challenge raised by teaching about environmental issues which do not necessarily involve one correct answer. This teacher's use of leading questions to draw students to a pre-conceived answer is an extremely widespread teaching strategy, first described by Barnes (and discussed in chapter 2):

> *"Much teaching leaves the pupils dependent ... upon quite trivial preconceptions set up arbitrarily either on the spur of the moment, or when the teacher planned the lesson during the previous evening. This reduces the part played by the pupils to a kind of guesswork in which they try to home in upon the teacher's signals about what kind of answer is acceptable ... The pupils offer intelligent suggestions but are not able to supply the required idea since it is relevant not merely to what they have been talking about but to where the teacher intends the lesson to lead."* (Barnes, 1976, p. 179-80)

This strategy, which reduces the students' role in the lesson to guessing what answer the teacher wants, appears even less defensible when the subject is controversial and therefore the teacher's desired answer may only be one of many possible options.

Closed elicitation was less commonly used in the extracts studied, and no example of its use by teacher 1 could be found. This may be simply because this teacher was less

enthusiastic generally about eliciting views from the students, or it may be that she was more prepared to state an opposing view herself if she felt it was missing from the debate. However, the use of this strategy did allow the other teachers to present a specific dissenting view without having to state it themselves or get involved in an argument. Instead the students were encouraged to consider alternative positions:

"I want them, rather than me, to see there could be another view. If I simply say, 'yes, and another viewpoint might be this' then I am taking away from them the opportunity to think that through for themselves." (CS3: T1 381-3)

The strategy of closed elicitation utilised the teachers' power to control turns in a discussion, to enable differing views to get a more equal airing and prevent individual students dominating the lesson. This strategy was used particularly when:
a) The teacher disagreed with what a previous student had said and wanted to bring in an alternative view ("I felt that he might well have missed the point on that." (CS3: T1 354-5));
b) When dominant students were not being sufficiently challenged - it was used to bring in more reticent students to express an opposing view, and to provide an alternative to a direct challenge by the teacher (".. it was going from Jake and Paul to Vanessa - and so I kept bringing Vanessa in." (CS2: T2 435-6))
It was used by teacher 2 when she felt that she had been getting too involved in the debate, or 'getting into an argument' with the students (see section 5.4). This strategy allowed her to withdraw from the discussion whilst still enabling a diversity of views to be aired.

The teachers' ability to control participants' entrance into the discussion has the advantage of enabling them to draw in students at what they consider to be appropriate moments. It encourages students to articulate counter-arguments and can prevent individuals from dominating the argument. It is also potentially useful as a strategy for providing balance whilst avoiding the problem of having lessons which are dominated by the teacher who is required to present all points of view. A final advantage of the use of this strategy, in the context of encouraging students to examine their own values, is the possibility that a challenge from another student may be more effective in encouraging students to reconsider their own attitudes than a challenge from the teacher. Jones (1988) comments on the "more powerful and effective" nature of challenging questions which come from the students themselves (p. 102). Accordingly, the teacher may be able to improve the depth of discussions by encouraging students to question each other's views in a non-confrontational manner.

However, the strategy of closed elicitation has a number of potential problems. Firstly, it may be difficult to encourage students to present a dissenting view against their confident opponents, and their arguments rarely provide a convincing challenge to the dominant students (note particularly example iv, lines 220-225). The teachers, when they did enter a discussion, tended to provide a much more effective challenge since their arguments were often more forthright and convincing. Also, although the teachers aimed to limit personal involvement in the discussion, this strategy sometimes appeared to be used to support their own point of view, being brought into use when a student had expressed an argument or opinion with which the teacher disagreed. For example, teacher 2 admitted that she was less than neutral about whether Greenpeace should have a role in governing Antarctica, and this may have influenced her use of this strategy:

"I think (Greenpeace) have got a very very important role to play, definitely. Even if it's just that it's keeping other countries on their toes, you know. I think their presence has got to be felt, people have got to know they're there, and I think in a situation like Antarctica where you've got so many different countries involved, having an organisation which is made up of members of all those different countries, whose sole aim is to protect the environment. I mean I think they should be really well involved in any meetings or discussions. I don't think they should have more clout than an individual country but I think they should have as much as one country. (I: So not just lobbying?) Yeah more than that. And I think perhaps that came out a bit, in the questioning as well." (CS2: T2 493-504)

Bridges (1979) discusses a similar situation, arguing that a teacher apparently fulfilling the procedural function of chair of discussion may in fact also be controlling its content:

> *"The deliberately or unselfconsciously manipulative chairman may exhibit an obtuse blindness to the signals of those whose opinions he dislikes and an ever ready eye to the voice he approves of or the barely restrained comment which was what he would really have wanted to say himself ... (Thus) formal procedural control over a discussion may be sufficient to allow such a chairman to produce the argument he wants ..."* (Bridges, 1979)

In the current study, the use of closed elicitation ('does anyone disagree?') to challenge an opinion with which the teacher disagreed, did not appear to be a conscious strategy; rather it appeared to reflect the teachers' increased awareness that a statement they disagreed with was potentially controversial (and that others are likely to disagree with the speaker). However, whichever student has expressed the initial opinion is likely to perceive their answer as in some way 'wrong', since the

rules of classroom discourse suggest that a repeated question by the teacher indicates an incorrect answer[6] (Edwards and Westgate, 1994).

6.3 Enabling students to discuss their own views

6.3.1 Definition of the strategy

This refers to occasions when the teacher allows students to discuss their own views about issues in a whole-class situation, with limited input from the teacher. Students' comments are not usually addressed to the teacher, but to other students in the class, with the intention that students should develop their own views, and come to their own conclusions about the controversial environmental issue. Student discussion may develop from open elicitation but involves a shift in power away from the teacher onto the students as they control the direction and content of the interaction. This strategy is concerned with enabling students to express their own opinions, and therefore excludes role plays in which students are allocated different parts to play by the teacher. It provided another possibility for the teachers to enable students to present a diversity of opinions without becoming too involved themselves. Often the teacher would pose a question and then withdraw, leaving the students to their own discussions. However, the teachers did encounter some problems in remaining uninvolved in such discussions, and this strategy often merged into 'challenging student views' (section 6.4). In the extracts studied, this strategy was used by teachers 1 and 2 but not by teacher 3. (The possible reasons for these differences will be considered later).

6.3.2 Examples of the strategy in use

i) Case Study 1: Extract 2

In this extract, the teacher asks a question, and then withdraws from the discussion, leaving the students to talk amongst themselves and express differing viewpoints about whether countries with rainforest in should be paid to conserve that forest:

25 T: Well, Sarah said they should preserve their forest because we need it for recycling carbon-
26 dioxide and producing oxygen through photosynthesis, and I'm saying, fine but are we going
27 to pay them for that? Are we going to pay them for the oxygen we breathe?
28 P: (general replies of no)
29 Alex: It's a free good
30 Andrea: No, because they need it too
31 Sandy: We should do something like that, yeah.
32 Kevin: Yeah, if we don't pay for them, then they'll just chop it down anyway.
33 Alex: It's a free good
34 Kevin: But they'll just chop it down anyway

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6 This is exemplified in 6.2.2, extract v, in which the teacher feels the need to add 'I'm not shooting Mark down' to his request for a contrary viewpoint, in order to emphasise that the normal rule does not apply.

35 T: Yeah
36 (more discussion between various groups of students - unclear)
37 Sarah: Can we do the next one now?
38 T: OK.

Several students express a variety of opinions, and provide reasons for their views (lines 29-34). The teacher makes no attempt to draw the discussion to a conclusion or insist on an answer to the initial question posed, but allows the students to consider the issue, and make their own minds up about what should be done.

ii) Case Study 2: Extract 2 [7]

After eliciting students' views with an open question about the role of Greenpeace in Antarctica (see section 6.2), much of this extract consisted of student discussions in which the teacher says very little. These are interspersed with sections where the teacher appears to get more involved in the discussion, asking questions or making statements and challenging students' remarks (described in section 6.4). In the following section, Jake and Paul are arguing that Greenpeace are ill-informed, under-resourced and un-elected, therefore they should not have a role in governing Antarctica, but Lara, Vanessa and Dan disagree:

19 Jake: No, they don't have the facilities and the resources to erm .. have so much er .. research
20 stations as the government.
21 Lara: But they don't have darkened motives
22 Jake: How do you know?
23 Paul: Not darkened motives! Of course they do.
24 Vanessa: (jokingly) They're not evil Paul
25 T: Vanessa what were you saying? Why do you think they're needed?
26 Vanessa: (laughs) I was just saying .. Well they give some protection to the .. to the country
27 T: Is that necessary here?
28 Vanessa: Well, yes ..
29 Dan: Yes
30 Vanessa: It'd be plundered otherwise
31 T: Would it? According to the treaty, they're not going to plunder it.
32 Vanessa: Yeah well!
33 Dan: No, that's only because Greenpeace have a say in the treaty because they are sort of ..
34 Paul: What? They have nothing to do with the Treaty
35 Dan: Yes they do because they go into the meetings, they suggest ...
36 Paul: Oh yeah, alright then. But they're just a limited company in Britain, no more than that.
37 They're not elected, they're not ...
38 T: So ..
39 Vanessa: It doesn't mean they're stupid and ignorant, Paul
40 Paul: Well it means that they shouldn't have the right to rule the world if they're non-elected
41 Vanessa: We're not giving them the right to rule the world
42 Dan: Paul, we're not giving you the right to rule the world!
43 Paul: What?
44 Jake: What? .. Irrelevant Dan .. (laughs)

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7 See also case study 2, extract 1, lines 7-12 and 21-33 and extract 3, lines 70-89 (Appendices A3.4 and A3.6)

The teacher has very little to say in much of this discussion, intervening only briefly in an apparent attempt to encourage Vanessa to expand her argument. The majority of the talk is dominated by the students. Similarly, later in the extract, the students continue their argument whilst the teacher remains silent:

88 Lara: Well because all governments have darkened motives and they're all corrupt ..
89 Jake: Why can't they? Why can't they have darkened motives?
90 Lara: Because they're environmentalist liberals
91 Jake: That doesn't mean that they're .. that they're not looking after their own er .. decisions.
92 Everyone's got priorities and their ..
93 Vanessa: Yes but they're .. but they're .. Well precisely but their priority is to conserve, not to
94 exploit like most governments
95 Lara: Yeah exactly
96 Paul: Well the government wants the best for the people .. (unclear)

As the argument between the students becomes more heated, the teacher's role appears to move towards one of 'referee', and she intervenes in the students' discussion to enable all sides to have their arguments heard, but does not offer support for either one or the other:

111 Jake: I was saying would she like the Green party as being er .. government? And she shook
112 her head.
113 Lara: No, no.
114 Jake No, why not?
115 Lara: But that's totally irrelevant
116 Jake: No, what's the difference?
117 Lara: Greenpeace is a different ..
118 Jake: They're still fighting for conservation as they call it
119 Lara: I know but they don't have very good ideas on education or ...
120 Jake: Just because they're politicians. What's the difference between politicians and a bunch
121 of hippies?
122 T: Go on Vanessa .. shh ..
123 Jake: It's ridiculous!
124 Vanessa: The point is .. OK, right. You've got a continent that is totally natural yeah. It
125 hasn't got any inhabitants ..
126 Jake: Yeah, why should a body though, unelected ...
127 T: No let her finish, Jake .. Jake! Let her finish!
128 Vanessa: Yeah right .. So it's totally uninhabited yeah, and you want to come in and exploit
129 it and take all the minerals out (Jake: yeah) and they want to conserve it (J: yeah) .. which is
130 fair enough because .. But, but then they don't have to have any sort of political training
131 (unclear) .. yeah but they don't .. nothing needs to be politically run in Antarctica. They
132 don't need to govern .. No but they don't you see, they don't need to say, OK right then we'll
133 give money, they have no idea how to do that. But that's a totally irrelevant issue ..
134 Jake: Exactly, and why should we give a job such as running a continent into the hands of
135 amateurs? (Confused uproar apparently from rest of class)
136 Vanessa: Yes, no but ..
137 Jake: They haven't got the resources to erm .. run a continent!
138 Vanessa: Yeah but it's a totally different ...

Again, the majority of the discussion is between different students in the class, and comments are not directed through the teacher, as in most classroom interaction. This style continues throughout much of this extract (see below and also lines 156-182; 222-234):

258 Jake: You can't put a bunch of amateurs who don't know ..
259 Paul: They're unelected!
260 Jake: .. they haven't got a .. they have one research station and that's sort of .. they got .. they
261 just don't have the resources and probably don't have the knowledge, and they don't have
262 the skill to run ..
263 Vanessa: That is ..
264 Dan: That is total bollocks
265 Jake: ... something like this
266 T: OK, Vanessa?
267 Vanessa: Don't have the knowledge to run something like what?
268 T: Vanessa?
269 Jake: They are a lobbying group, that is what they are!
270 Vanessa: Does that mean that they're totally un-intellectual, that they can't do anything
271 Jake: No, I'm not saying they're not intellectual
272 Vanessa: That is what you're saying. You're saying they ...
273 Jake: I'm not! By saying someone's unskilled, it doesn't mean they're completely thick.
274 They're un-elected!
275 Dan: Excuse me, Jake!
276 T: Dan! Dan!
277 Dan: Do you think we should dump our rubbish down there?
278 Jake: I don't .. It's not to do with what I think ... I definitely don't want it .. It's about reality
279 Dan.
280 Dan: OK, OK, OK .. we dump rubbish down there, yeah?
281 Jake: I'm just saying that Greenpeace and these non-government things shouldn't have a
282 huge say
283 Dan: They should! They should!
284 T: Let him finish, Jake
285 Dan: They should have a say. We got to agree to disagree then.
286 Paul: What Dan, this is reality here. I can bet my life in 50 years time it won't be Greenpeace
287 running Antarctica ever (laughter). ... With democracy, you have the power of the people. If
288 there's a minority you don't want that to happen. You got to have corruption in a democracy

In this extract, the students have a much wider range of roles than normal when discussing between themselves. The majority of classroom interaction has been shown to consist of what is known as 'the essential teaching exchange' (Edwards and Westgate, 1994), whereby the teacher asks questions, the students answer, and the teacher evaluates that answer. In this discussion, however, rather than being passive recipients of the teacher's knowledge or respondents to questions asked by the teacher, students ask questions of other students, answer questions posed by other students, and several attempt to take on the role of expert usually reserved for the teacher.

6.3.3 Students' perceptions of the strategy

Whole class discussion was generally popular amongst students from all 3 case studies. They enjoyed the relative autonomy from the teacher, found it interesting and engaging, and therefore felt that they concentrated on the subject and found it a more memorable learning experience than other classroom activities:

S: If you can sort of discuss around the class and stuff, I find I take a lot more in, rather than just listening to something all the time... (CS1 SA1 233-4)

L: I think (discussions are) quite good ... because if they're saying something you don't agree with you'll kind of take it in and then try and think of things to argue back, so it's quite a good stimulus. (CS2 Lara 1 202-7)

J: .. you get involved and you can speak to other people ... they're fun and you get the facts across. (CS2 Jake 1 10-13)

R: When the lessons are less structured we do have big arguments in the middle of them. I mean geography is (sometimes) quite good for that. Friday afternoon we generally spend discussing wider issues around the subject. (CS3 Rufus 1 310-19)

Several students described discussions as 'fun', and felt that time passed more quickly, but it is clear from the previous comments that they also felt that they could be valid learning experiences. There are also indications that the students appreciated their higher status as providers of information in discussions, rather than their usual role as passive recipients of information:

H: We get a chance to talk instead of just listening, which is good. (CS3: Hannah 1 21-22)

The emotive aspects of classroom discussion were mentioned as a benefit, with several students suggesting that people were 'more animated' or 'psyched up' in classroom discussions, and this increased their involvement with the subject matter. However, the depth of feeling sometimes aroused by classroom discussions was described by several students as 'aggressive', an aspect which was seen as an advantage by some students but a problem by others:

J: The discussion ... was pretty memorable, quite aggressive, I quite enjoyed myself. (CS2 Jake 1 6-8)

W: I mean, the trouble with discussions is sometimes it can get overheated and people can just start saying ..
S: People get really annoyed with each other
W: .. you know, I hate you, and then it's just really ..
S: Stupid and out of control (CS1 S3 434-8)

One student explained that he deliberately took up controversial positions in the discussion to 'wind people up' (CS2 Jake 1 25-8), and other students felt that there were certain people who tried to 'aggravate everyone' (CS2 Lara 1 153-6), which added to the heated nature of some discussions. Jake justified his stance as opening up new arguments in a debate in which students commonly had fairly similar viewpoints, but his stance was not universally popular, with another student describing him as, 'bossy and over-talkative' (CS2 Dan 2 32-3).

Some students felt that they were more likely to be open about their own viewpoints if the teacher was not over-involved in the discussion; however, others (especially in case study 2) felt that a certain degree of teacher control was necessary to prevent the

discussion being dominated by the inevitable forthright students. Furthermore, although most students enjoyed discussions, a common complaint was that they were too unstructured and students found it hard to see what relevance they might have. Their view of effective learning was very much dictated by examination success, and these discussions could make it difficult to get good notes to revise from:

Al: Sometimes (discussion) doesn't get the theory out though, I mean it might be opinions rather than theory if you're discussing things, but I think that's an interesting way and an exciting way of doing it. (CS1 Alex 2 99-102)

S: (In discussions) you're not writing anything down, so you might not remember it as easily. (CS1 S3 620-22)

L: It was quite difficult keeping up the argument and we got really side-tracked, and didn't really come to much of a conclusion ... We were just going round in circles and becoming irrelevant. (CS2 Lara 2 12-21)

D: It was a bit mix and match today, I mean some parts were side tracking and sort of going off on a tangent ... about the NGOs where we just started talking about them, and arguing about them. (CS2 Dan 2 16-23)

It appears that the students perceived an important compromise to be necessary between the teacher enabling the students to talk amongst themselves, and valuing their contributions to discussion, whilst at the same time controlling the direction and flow of the discussion to ensure that it remained within the area of concern.

6.3.4 Advantages and disadvantages of the strategy

Student discussions were much more evident in case study two than in either case study one (where discussions were infrequent and brief) or case study three (where no discussions were observed). These differences in use were reflected in the student comments, with students from both case studies one and three stating that they would prefer to have more discussions in class than were generally permitted. The differential use of this strategy may again be due to the difference in value placed on student contributions by teacher 2 (described in section 6.2), although one student in case study three provided an alternative explanation for the apparently highly structured nature of teacher 3's lessons. He explained that the group had been taught by a series of different student teachers, and had recently complained about the lack of structure of lessons, and the resulting confusion in their notes. This may have led teacher 3 to use more didactic styles of teaching than was normal for him.

The potential advantages of using discussion in the teaching of controversial issues are described in some depth in chapter 2. These include providing access to a diversity of views; reducing teacher influence and the possibility of indoctrination; and student enjoyment and skill development. The student comments cited in 6.3.3

support many of these advantages: The students found discussions interesting and enjoyable and felt that they could (at least potentially) provide valid learning experiences. Discussions - especially in case study 2 - provided the students with many opportunities to talk about their own views, and to draw in information gained from the media and other sources, thereby widening the debate. It seems likely that in some of these discussions a wider range of issues was covered, and more aspects were considered, than would have been possible if taught by the teacher alone. This teacher herself commented on this on at least one occasion:

"... some of the ideas and the focus on politics wasn't something that I'd necessarily put down - all I'd put down was 'talk about the role of NGOs', what they think, and I certainly didn't expect all that to come up which was really good because ... in the syllabus constantly it's referring to the political constraints or political ideology, and it's something that's quite difficult to find resources on." (CS2: T2 16-21)

However, the students' comments also indicate that the teacher must tread a fine line between valuing students' opinions and giving them freedom to discuss amongst themselves, whilst preventing the discussion from getting out of hand or off the point. Jones (1988) explains that students' views of valuable learning experiences are often very narrow, and relate to remembering facts, rather than to discussion skills. This may lead to an undervaluing of classroom discussion due to the students' 'transactional view of education' (p. 74). He reports that students do not feel they can learn from each other, but must acquire knowledge from the teacher:

> *"Pupils rate small group discussion work low as a learning activity as their picture of what learning is about is at odds with the progressive teacher's views."* (Jones, 1988, p. 75)

He reports similar concerns about the value of whole class discussion. However, the students in this study expressed far from clear cut views. Many of them greatly enjoyed discussion and, in some situations, felt it could be a valid learning experience. It may be that as sixth formers, they were more open to the idea of discussion and of viewing their peers as potential sources of information than are younger students. Nonetheless, some remarks do show a strong emphasis on examination success as encapsulating effective learning.

Some of the students' other complaints about discussion also echo those found by Jones (1988). In discussions where the teacher has little involvement, problems can arise from their unstructured and commonly aggressive nature:

> *"There was, as in all class discussions, an impersonal, risky feel; a touch of aggression. This was no place for the supportiveness and tentative flavour of exploratory discussion. Here was an arena where your colours were laid out and they had better be acceptable."* (Jones, 1988, p. 92)

Several of the extracts from discussions cited earlier demonstrate these problems clearly (especially 6.3.2 example ii), giving the impression of a confrontational exchange of view, unlikely to encourage reflection and serious consideration of others' opinions. This may explain the students' concerns about such discussions 'getting side tracked' or 'going round in circles' - there is little effort made to compromise or to see each other's views, instead the apparent aim is to 'win the argument'.

Billig (1987) discusses this problem in the context of a varying 'discussion situation' (outlined in chapter 2), commenting on situations where contradiction is the dominant spirit, and arguments are opposed and resisted directly. He cites experimental evidence which suggests that people will select one-sided, unqualified expressions of their attitudes if they know they will have to confront others who oppose their views:

> *"... if a confrontation, rather than a discussion, is anticipated, then there can be a hardening of attitudinal expressions."* (Billig, 1987, p. 236)

This may explain the uncompromising positions taken by some of the students in these discussions. Under other circumstances, it is possible that milder expressions of their attitudes might have been used, in a spirit of co-operation. Certainly, some of the points of view expressed in discussions appear quite extreme in nature, although this may also reflect the tendency for certain students to make extreme or 'newsworthy' statements in lessons in order to attract more attention (Rudduck, 1983; French, 1984).

There is also evidence of the problem, discussed in chapter 2, of students deliberately taking up certain positions in order to challenge the teacher or other students. Jake describes his actions as 'winding people up', and other students interpret his remarks in a similar manner. Whilst this leads to a certain degree of animation in the discussions, it can also cause other students to withdraw completely. Students who, in a small group discussion with the researcher, had plenty to say on the subject, remained almost totally silent in lessons, apparently put off by the scale of the argument:

L: Yeah I get lost when people start arguing and ..
Je: But didn't we have work to do as well (agreement all round). I was still working while you two were having your argument. I had Paul shouting in my ear while I was trying to do the work and stuff.
I: Uhuh, yeah so there was something else to do at the time?
L: yeah I just lose thread completely ..
Je: Yeah
L: .. when they all .. forget what they're talking about
J: Well we normally go off on a tangent ..
(Yeah - everyone agrees!) (CS2 S3, 256-65)

When a small number of students dominate the discussions, as was frequently seen, the neutral teacher is unable to provide opportunities for all students to get involved, since they appear to be unwilling to take on their apparently knowledgeable opponents. This domination of whole-class discussions by a few, confident students, is discussed by Jones (1988) and French (1984). French suggests that the majority of turns are taken by boys, whereas Jones found a similar number of turns taken by both genders.

In general, the strategy of whole class discussion can be seen to be challenging and difficult to manage. It requires the teacher to tolerate a low degree of structure and organisation, and to give up a considerable degree of control over the content and management of lessons:

> *"The teacher must be willing to relinquish some authority over what goes on in the classroom. During a lecture, the teacher has complete control over the ideas under consideration. In a discussion, every participant has some power to take off in a new direction. The teacher must share the authority to decide what is relevant and where the argument should go."* (Gage and Berliner, 1988, p. 432)

This may explain the reluctance of teachers 1 and 3 to use discussions, and the difficulties experienced by those teachers who did use it. Despite all the teachers' aims of non-involvement, the classroom data suggest that they found this difficult to maintain, possibly because of the extreme views being put forward by some students. The teachers apparently felt the need to intervene when extreme or unacceptable viewpoints were being expressed, hence the need for a different strategy such as challenging the students' views. These issues will be discussed further in chapter 7.

6.4 Challenging students' views

6.4.1 Definition of the strategy

This strategy refers to occasions when the teacher challenges the perceived or expressed views of one or more students. This may involve using questions or statements, but in either case the intent is to express a contrary view. In most cases, this was in response to a view which had been expressed by one of the students but, occasionally, the teachers challenged what they perceived to be a widely-held view amongst the students, even if this view had not been openly expressed in the class (e.g. ii & v below). All three teachers regularly used this strategy, often to support or negate different viewpoints in an indirect manner, using rhetorical questions rather than direct opposition. Occasionally, however, a teacher would provide an extended statement in support of, or against, one particular viewpoint, which could include explicit rejection of one or more of the students' viewpoints. (The classification of examples of this strategy is discussed further in section 6.4.4).

6.4.2 Examples of the strategy in use

i) Case Study 1: Extract 1

In this extract, the teacher and students are looking at the impact of indigenous people on the rainforest environment, using the example of the Maring people in Papua New Guinea. One of the students has become confused and thinks that 'Maring' refers to a type of forest, leading the teacher to explain:

18 T: Mmm .. Well they call it the Maring's forest because it belongs to the Marings, yeah.
19 Sarah: It doesn't belong to them, they just live there
20 T: Ah well that could open up all sorts of debates, Sarah, couldn't it? If it doesn't belong to
21 them, to whom does it belong? And does that mean that indigenous people ...?
22 Sarah: It doesn't have to belong to anybody, they just use it.
23 Pupils: (Other responses inaudible)
24 T: And does that mean .. does that mean that indigenous peoples have no land rights?
25 S: No
26 T: By actually saying that you've actually .. touched on some of the main issues ..

Sarah argues that the forest does not belong to the indigenous people who live there, a view which is immediately challenged by the teacher. The teacher uses a series of three leading questions (lines 20-21; 24), which appear aimed at encouraging Sarah to think more deeply about the implications of her views, and to express disagreement with them. She later expresses her disagreement more explicitly, offering a clear statement in support of the indigenous people's rights to land (lines 34-9):

34 T: Sarah when you said about it doesn't belong to anyone, no-one's forest,
35 that's one of the arguments that indigenous peoples have had throughout the world that
36 because they didn't have pieces of paper and titles to the land, erm, through law courts .. erm
37 (students giggling in background) .. Sarah .. shhh .. Erm .. it meant that other peoples came
38 in and took their lands away from them and displaced them from their normal habitat, where
39 they normally live .. so ...
40 Alex: Survival of the fittest
41 T: Erm .. If that's ..
42 Sarah: I'm not saying it should belong to anybody else
43 T: That's OK to say that as long as you happen to be the fittest Alex. If you found you
44 were not quite as fit as somebody else, you might not take such a view .. It was just a trite
45 statement that erm, wasn't thought out properly.
46 A: Who me? Saying that?
47 T: Mmm, mmm.
48 A: Well it's nature isn't it, we're all part of nature, and those that can't survive die. Yes, if
49 you're one of the, if you're one of the people that do die ...
50 T: Right, so what, what separates, what separates ..?
51 A: I wouldn't want to be one of the people that, that .. (unclear)
52 P(G): Miss, we're stuck on something
53 T: Yeah, well, I'll just say to Alex I'd just think about what separates human beings from
54 other animal species .. and what makes us a social species, perhaps with social responsibilities
55 and conscience. Erm, there's actually more to living on this earth than just .. So you think..

In lines 34-9, the teacher explains more fully that indigenous people have been displaced from "their lands", and "their normal habitat", emphasising that she does consider the forest to belong to the indigenous people who have traditionally lived there. Another student joins in, suggesting that displacement of indigenous people represents 'survival of the fittest' (line 40), a view which is forthrightly rejected by the teacher. In this case, she uses statements, rather than questions, to challenge the student's view and to encourage him to think about the consequences of this position. She explicitly rejects his view as, "a trite statement" (lines 45-6), and expresses an opposing view, suggesting that natural selection is not an appropriate model for human societies (lines 53-6).

ii) Case Study 1: Extract 2

In this example, the teacher responds to a student's comment by challenging the view which is perceived by the teacher to underlie the student's comment, namely that saving the rainforest is universally beneficial (lines 7-15). This is not a position that has been explicitly stated by this student, or any of the other students, but is nonetheless a commonly-held view, and one which later student comments suggest that some of them do hold[8]:

5 Lisa: Erm, then everyone being there that, they're trying to save the forest and not cut it down I
6 think ..
7 T: Well save, save the forest for who? If you say save the forest it's like sort of having all your
8 money and pushing it under the mattress and doing nothing with it. So you've got this, you've
9 got this pile of money that you've stuffed under your mattress, and it actually is no good to you
10 while it's sitting under the mattress. It doesn't improve the quality of your life, it doesn't

[8] A similar example can be found in case study 1, extract 3, lines 82-109 (Appendix A3.3)

11 improve the quality of your existence, it's just your heirloom that you might take out, dust off
12 from time to time, but in the meantime you might be living in absolute poverty, erm .. with
13 ten million pounds stuck under your bed. So, you know, when you're looking at forestry as a
14 resource, and you're looking at the timber industry, you know, preserve the rainforest - for
15 who, for what? And what good's that? I mean that's what they would say.
16 Sarah: Oxygen!
17 T: Sorry?
18 Sarah: Oxygen
19 T: .. Oh you mean sort of the countries that, the countries that have all the forest in, it's their
20 duty to keep their forest there so that we can carry on breathing?
21 P: (vague murmurs of yes)
22 T: Are we going to pay them for that? .. 3 .. (more murmuring) Shh! Erm, don't start up your
23 little conversations! Are we going to pay them for that? .. 5 ..
24 Alex: Pay for what?
25 T: Well, Sarah said they should preserve their forest because we need it for recycling carbon-
26 dioxide and producing oxygen through photosynthesis, and I'm saying, fine but are we going
27 to pay them for that? Are we going to pay them for the oxygen we breathe?

In this extract, the teacher argues quite strongly that for the people who live in countries with rainforests, these are an important resource which it makes sense for them to exploit and thus increase their wealth, citing the powerful comparison of 'living in absolute poverty with ten million pounds stuck under your bed'. This view is perhaps one which might otherwise not have been heard and thereby broadens the debate. The teacher's statement also has the effect of leading other students to express their views of the situation (16, 18, 21) which are then further challenged by the teacher, using questions (19-20; 22-23; 25-27). Although in this extract the teacher does not explicitly reject any of the views offered, her questions nonetheless suggest disagreement with the students' views. For example in lines 19-20, there is more than a hint of sarcasm in her suggestion that countries with rainforests should preserve them for the benefit of others, and she clearly feels that payment should be offered for rainforest protection (lines 22-3; 25-7).

iii) Case Study 2: Extract 1

This extract occurred in the context of what the teacher described as a "brainstorming" session on potential threats to Antarctica, and concerned the issue of whether nuclear testing was a potential threat to Antarctica. In this extract, the teacher uses rhetorical questions to challenge Paul's confident assertion that nuclear testing is "perfectly safe" (lines 11-12). The teacher's challenge leads to further discussion, with input from various students, and also enables the teacher to indirectly dispute Paul's view (lines 14; 18-19):

11 Paul: It's all perfectly safe. (laughter from other students) They do it about 50 miles down in a
12 coral reef thing. It doesn't matter.
13 (Other students break in to argue, but can only hear teacher over them)
14 Teacher: So that's perfectly safe then isn't it, if they just do it over a coral reef?
15 Paul: There's more nuclear waste in Sellafield than anywhere else on earth, and it's only a
16 couple of hundred miles away, and we're not in any danger.
17 (more student comments inaudible below this comment)

18 Teacher: But isn't it contained in Sellafield in a special way rather than just being allowed to
19 diffuse through the sea?

Although the discourse is characterised by disagreement, the teacher's disagreement is expressed in a somewhat constrained way, distinguished particularly by the use of questions. However, as in the examples above, there is no sense of a hesitation to disagree - although the teacher's disagreement is expressed in a somewhat indirect form, there is never any confusion about her intention. She is not using hedged agreements 'that is true up to a point' or 'yes but ..'; she is quite clearly questioning the grounds for Paul's argument, and implicitly suggesting that nuclear technology is a threat. For example, her question, "so that's perfectly safe then isn't it, if they just do it over a coral reef?" (line 14) is clearly sarcastic - exemplified by the exact repetition of the extreme wording used by Paul, together with the addition of the word 'just'. The tone of voice also makes her meaning clear to the students, and the effect of the question is a direct refutation of Paul's comment. His response, which is to bring in a supporting argument about the safety of nuclear power stations (lines 15-16), also provides clear evidence that the underlying meaning (that it is <u>not</u> safe) was not lost on him. Similarly, in the teacher's next comment, the use of a question ("But isn't it contained in Sellafield ...?" - lines 18-19) disguises a statement which she would like the students to agree with ('It <u>is</u> contained in Sellafield ..').

iv) Case Study 2: Extract 2 [9]

After starting this extract with an open question and neutral probes to encourage students to express their own views about the role of Greenpeace in Antarctica (see section 6.2.2), the teacher soon becomes more involved in the discussion, challenging Jake's view that Greenpeace are 'ill-informed', with repeated questions:

14 Jake: And often they're ill-informed as well - the Brent Spar and things
15 Vanessa: Yeah, but it'll protect the continent. I mean it'll sort of not fall into the wrong hands.
16 Paul: Well how do you know that Greenpeace aren't wrong?
17 T: How do .. Why should Greenpeace be any more wrong than any other scientist? Are you
18 saying that Greenpeace doesn't have creditable scientists?
19 Jake: No, they don't have the facilities and the resources to erm .. have so much er .. research
20 stations as the government.

The teacher's questions (lines 17-18) again suggest disagreement with the previous comments, but do so without explicitly refuting them. Her open questions, which she used at the start of the discussion, have rapidly changed into rhetorical questions, indicating that her initial 'neutral' stance had proved difficult to maintain. Jake responds by defending his view, and explaining his position in more detail. Later in

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[9] Similar examples of this strategy can be seen in case study 2 extract 3, lines 57-69 & 87-124 (Appendix A3.6)

the extract, similar questions are used (see below), apparently in response to the domination of the argument by Jake and Paul, whose confident articulation of their views is preventing other students from effectively expressing opposing positions:

137 Jake: They haven't got the resources to erm .. run a continent!
138 Vanessa: Yeah but it's a totally different ...
139 T: Jake, are we saying run it, or are we just saying be part of the process?
140 Jake: To run a continent, to have power, to have power over a continent is .. to run a
141 continent. It's exactly the same thing.
142 Vanessa: Yes, but it's a continent with no people on it
143 Jake: Well there could be people. That's the whole point. It's land
144 Paul: You're making a decision to preserve it without consulting ..
145 Vanessa: Well no, but Britain has got millions of people on it and you'd have to run the
146 people as well as land if you had ...
147 Jake: And you're running the people, the people who are trying to exploit it, you're running
148 them and saying no you can't do this, blah blah blah!
149 T: No, but are people saying that they are going to have the ultimate say? They're not saying
150 they're going to have the ultimate say, they just want them to be part of the process ..
151 Jake: Yeah they are part of the process ...
152 T:... and have as much say ..
153 Jake: .. in their lobbying process. But you don't want them to have ..
154 T: But they're not really though are they? They're not .. they're part of the process in
155 lobbying but they haven't got as much power as Argentina, Britain and the rest.
156 Jake: It's like putting a green dictatorship in to letting them have a say. It's exactly the same!
157 They're not voted in ...

In this example, the teacher's questions become more forceful, and are clearly intended as a direct challenge to Jake's viewpoint. These questions are of a different nature to the open, 'value' questions seen at the start of this extract, and appear to have persuasive intent, rather than aiming to elicit information and viewpoints from the students. In much of the discussion, there is no doubt that the teacher is providing arguments in support of the view that Greenpeace should have a role in the management of Antarctica. Her questions are rhetorical, even to the extent that she provides answers to two of them herself (line 149-50 and 154-5). By this means she disputes Jake's view and supports Vanessa's - but does not explicitly say that any of the students are wrong. Later still in the argument, this strategy is seen again - in this example, the teacher actually silences Vanessa in order that she can challenge Jake and Paul herself, and appears to be arguing quite strongly:

187 T: But you've just said they have to have a government. Vanessa, hold on! They have to
188 have a government yeah? And you were also saying about you can't let anyone in, it just
189 turns into a dictatorship, it's almost like you need election. But you've got lots of countries
190 there which weren't elected to be there by anybody ..
191 Jake: No, I'm not talking about that ...
192 T: Hold on! Let me finish! Let me finish! They weren't elected to be there, and have you
193 actually got a government set up there?
194 Jake: Well they were elected!
195 T: .. Or have you got lots of different systems of government?
196 Jake: Well they were all elected!
197 T: No. You've got 42 signatories now, that's not the original people that signed the treaty,
198 they weren't elected in, they just came along and they said we want to be on the signatories,
199 and basically anybody can be.

200 Jake: They've got to be at the UN and they've got to be invited. That's what the thing said!
201 T: Right. Why then cannot ... 'cause I think .. I'm not saying, and I'm not saying I believe
202 this, I'm just posing this as a question: Why can't you have erm - if an NGO, not just
203 Greenpeace - perhaps another kind of Green Party, perhaps the South Oceans Coalition -
204 come along and say can we be a signatory on it? We don't want to be any more powerful
205 than anyone else, we don't want to have a dictatorship and say we are going to have the final
206 say or be an overseer, but can we have as much clout as all the other countries in Antarctica?
207 Paul: Well if they were elected by the people of the world like all the world governments
208 are, then yes, but they won't be. I mean how can you have an organisation like Greenpeace
209 that's got .. things all over the world? So it's not one country ... so what you do is get ..
210 T: But isn't that the whole purpose of Antarctica? To have representatives from all over the
211 world? To have someone that's not just interested in their country?
212 Paul: The world's people, they .. Right so the British people have a British government, they
213 elect them every 5 years, and so every government around the world is usually elected and
214 even if it, isn't it represents the majority of the people. And so then they ... these people .. the
215 government are the representatives of the people and they go to Antarctica and they make
216 decisions (right). So that's totally fair and totally elected ...
217 T: Isn't Greenpeace a world organisation, doesn't that have representatives..?
218 Paul: They're not elected, they're the minority of the people, and they're just a business like
219 any other (OK). They fund raise, they're not ...

Here, the teacher starts using statements as well as questions to challenge Jake and Paul's views (189-90; 197-99). She explicitly distances herself from the argument she is putting forward in some depth here - that Greenpeace have as much right as a government to request to be a signatory on the Antarctic Treaty (lines 201-206), because they have representatives all over the world (210-211) - by stating that it is not necessarily her own view (201-202), indicating that she realises that she has been arguing quite firmly in favour of one particular viewpoint. As the discussion continues, the teacher appears to become increasingly frustrated with the views expressed by Jake and Paul, and both sides become more heated:

232 Paul: Well if they're just a lobby group then they shouldn't have any power in Antarctica
233 then. And if they want power in Antarctica ...
234 Dan: They should have power in Antarctica because they're doing the right thing ...
235 T: So do you think - if you look at these pictures in a minute - all these people that
236 turned up to the Earth Summit, that were lobbying, that weren't elected. Are you saying they
237 shouldn't be heard, they don't count?
238 Jake: No that's our bloody point!
239 Paul: They're there to lobby. That's why you have democracy, and you have all the political
240 parties who were elected and you have lobby groups like the people who represent the
241 gunmen, the shooting lobbyists (laughter) and the people who represent each of these
242 minority groups and they try and lobby government. If they've got some money they bribe
243 the government. It's like in America, the gun lobby in America got so much money that they
244 can just pay a senator to pay for his election campaign and then when the senator doesn't do
245 anything about increasing the gun laws so that you can have more guns, then they start to
246 sort of ...
247 T: So that's right is it? That's right?
248 Jake: It's democracy!
249 Paul: It's reality!
250 Jake: It's democracy
251 T: Right, so basically you're saying that's reality therefore it's right?
252 Jake: The world isn't perfect, it's not right.
253 T: That's .. yeah, that's like saying ...
254 Dan: But that's why Greenpeace should be .. (unclear)
255 T: Surely Jake that's like saying, 'sod the third world, the world's not fair, that's just the way
256 it is'.

At the very end of the extract, the teacher has one final attempt to convince the students, before agreeing to differ:

305 T: But they will have a say through their lobbying
306 Paul: Yeah well lobbying you can always ignore it! (laughter)
307 T: Yeah, and isn't that the point? That's .. that's the crux of it. In the end, they can be
308 ignored. So in the end you could have .. different aims being pursued and you haven't really
309 got anyone overseeing to ensure that the treaties are successful, you're just hoping that
310 everybody has good intentions really aren't you? That's what you're basing the success
311 of Antarctica on - that in the end you can trust all these countries to have good intentions.
312 Jake: Yeah, but that's what you say if you want Greenpeace in there - you're gonna have to
313 trust them to keep their .. to keep on their aims..
314 T: Yeah, but you know .. their aims are more blatant aren't they? They are basically
315 environmental. That is their basic aim, isn't it? (Silence) You don't have to agree with me
316 Jake! (laughs) You couldn't bear to!

v) Case Study 3: Extract 1

In this example, the teacher uses a chosen text to challenge assumptions about the landscape of Britain's Lake District, and to link in with ideas about rainforest destruction:

53 T: ... And it then
54 says finally, (reads): Much of the present poor grassland of the upland fells for
55 example is the end product of thousands of years of pastoral mismanagement. Now I
56 think that that's not a long article but it actually helps bring together many of the key
57 ideas in the syllabus through one little example. **And the next time that perhaps some**
58 of you may feel critical, or moved to be critical of third world countries who are
59 exploiting their forest reserves, it might be worth you bearing in mind that from
60 Neolithic to current times, most of our forest cover has been removed and we live in
61 totally un-natural ecosystems. We have gone through that process of deforestation.
62 Always .. um .. it always amuses me when younger children are so very quick to point
63 the finger at developing countries and saying, 'well, you know, we wouldn't do that
64 would we sir?' And yet, the evidence is that er forest clearance has taken place. Now, I
65 think I'm going to tidy that up and leave that as it is, because time is going apace and I
66 want to move on. I may supplement those notes with some extra ones but not at this
67 stage. So, as far as I'm concerned I'm going to draw a line under that particular key
68 idea.

Throughout this extract, the teacher has been presenting the idea that human impacts on the landscape have had considerable and long-term effects, and he emphasises that many people hold misconceptions about the nature of the Lake District as a 'natural' landscape. In this extract, he challenges the presumed view amongst the students that deforestation is only a problem in third world countries, by arguing that Britain has had its share of forest destruction. This is not a view that has been explicitly stated any of the students in this class, but is clearly one which he thinks that some of the students might hold. However, he carefully depersonalises this apparent criticism by referring to 'younger children', indicating a sensitivity to the feelings of the students. As in example ii), the view presented by the teacher is perhaps one which might

otherwise not have been heard, and is possibly something that the students have not considered before, therefore he widens the diversity of viewpoints by this comment. However, the students are not given an opportunity, in this extract, to state their own views.

vi) Case Study 3: Extract 2

In this extract, the teacher has been questioning an individual student about changes to the vegetation around footpaths due to trampling by humans. He asks George for his point of view, and then challenges him to defend it, asking a series of confrontational questions:

46 T: Yes, and when you see pictures like that which could have been our footpath from the
47 Cevennes, what do you think you might be thinking about there? Has change gone too far?
48 George: Yes it has, because (unclear) I think
49 T: You think. That's your view. Right. What makes your view think that that is .. why do you
50 think that that is an area now that wants changing .. or managing?
51 George: Erm .. cause there's no vegetation, or you can't see any vegetation on the paths ..
52 T: Right, so who cares, who cares a monkeys about that anyway? I don't care! I don't care a
53 monkeys. Why? Why should I care?
54 George: 'Cause it's changing. Man has changed the ecosystem by treading on it.
55 T: Right, you justify why you want to do something like .. change it then.
56 George: (laughs) You're being obnoxious now
57 T: Now, I've always been obnoxious!
58 George: (offers some supporting argument - unclear)
59 T: Well but so what? Who cares? I don't mind.
60 George: Are you going to tell me?
61 T: No I'm not. I'd like you to justify why you want to change that.
62 George: What so you would rather let it .. go to rot?
63 T: Well you tell me why I shouldn't

Unlike the previous examples, where each teacher appears to be arguing from a personal viewpoint, the extreme position taken by the teacher in this extract, together with his light-hearted tone, suggest that he is playing devil's advocate and does not personally support the position which he is proposing. The student seems to be quite disconcerted by the teacher's questions, and considers them to be out of the range of normal school questions, which should have a right or wrong answer. (He describes the teacher as "obnoxious" (line 56), and apparently tries to persuade him to reveal the 'right' answer (line 60).) The teacher appears to be trying to get the student to go beyond the simplistic initial answer (see section 6.4.4).

6.4.3 Students' perceptions of the strategy

The students' responses to this teaching strategy varied widely between the different case studies. In case study 1, the response of the students was generally negative because they believed that the teacher was trying to impose her views on them (particularly in example i), felt that she had not given them sufficient opportunities to explain or defend their views, and that she had misinterpreted their comments:

Al: Erm I think she went overboard a bit ... I mean her point of view was obviously different from mine, but I felt she was almost stuffing it down my throat slightly ... (CS1 Alex 1 55-6)

S: I found it quite hard because I don't think I'm particularly prejudiced ... If someone tells me that I've got my set ideas and I haven't even let them know what my ideas are yet then that makes me get a bit annoyed 'cause I haven't had my chance to prove myself if you like, and I find it unfair rather than the fact that it annoyed me ... She was sort of dismissing it before we'd said what we'd meant by it, you know. (CS1 SA1 46-61)

Al: Being told I was racist was the um ... Certainly that's what stuck in my mind about that lesson. I think if you say remember that lesson, that's the thing that sort of comes into my head! (laughs) Which wasn't the idea, I wasn't trying to be racist. (CS1 Alex 1: 25-30)

One student commented that a lack of time in the lessons meant that they rarely got a chance to explain their opinions and 'something you say can be taken the wrong way very quickly' (CS1 SA1 135). Another student mentioned the large class size as a possible contributory factor, but several felt that the teacher was too quick to criticise views that were expressed in class.

One student was more positive, suggesting that it could be an advantage to hear the teacher's views:

W: I think it was her own view. Maybe that's when her own views get involved but that's quite good, I don't mind that. Yeah I like that. When teachers give their own views as well as what they're meant to teach. (CS1 Will 1 90-3)

This was a student who had not been involved in the discussions and who had not been personally challenged by the teacher. However, even he felt that occasionally the teacher was 'putting words into their mouths' (CS1 Will 1 113-7). The other students in this case study believed that the teacher often expressed her own views, and did not give enough consideration to their views. It was not so much the teacher expressing her opinions which they objected to, but the way in which this was done:

Al: I think she was giving me another idea, another viewpoint, and the way she brought it across possibly was, you know sort of, here have, have this view! Take that one rather than ... (CS1 Alex 1 114-6)

A: It's not like I don't agree with her views, it just annoys me the way she puts them across. Some of them I agree with quite a lot. (CS1 S3 585-6)

S: If you say something, (the teacher) assumes that's what you think, and if she thinks it's wrong she'll say, 'no that's wrong', rather than listening to what you're trying to say. (CS1 S3 199-201)

Several of the students felt that the teacher underestimated their levels of knowledge and that she had a prior expectation that they would be 'really prejudiced' (CS1 SA1 267).

Students in case study 2 were considerably more positive in their response to the teacher challenging their views, believing that it helped them to understand the issues more fully, and to balance the argument, especially if it was being dominated by a small number of students:

J: She's pushing the arguments on and making people think, making people question their own arguments and seeing whether they agree or disagree with it. She's trying to broaden our views and to formulate them in a much more concise way, looking at the arguments for and against and allowing us to agree and disagree I think ... yeah it's good. (CS2 Jake 2 218-24)

L: I think when she said 'so that's perfectly safe then, isn't it, if they just do it over a coral reef', she was being a bit sarcastic to show that what the people were saying wasn't really coherent, and they hadn't really thought about it. Yes she's just kind of turning round their arguments to reveal that they haven't really thought them out properly, and trying to balance it out ... She's just spotting the holes in their argument and pointing it out. (CS2 Lara 2 176-93)

They were also much less critical of the way that the teacher went about challenging their views, feeling that she enabled them to make their own decisions and was not trying to impose her point of view on them:

J: She doesn't like to labour her own views on us, which I think is good ... I think she gives us questions that make us think, but don't influence us too strongly. (CS2 Jake 1 193-99)

Je: She doesn't say exactly, 'no, no', sort of 'I don't agree with it', she kind of asks the question in a way that doesn't exactly say she doesn't agree with it. She doesn't make her view totally one sided. (CS2 Jenni 2 145-47)

Several students felt that the teacher's questions were very important, and the comment below indicates that this student felt that different types of questions were appropriate in different situations:

L: (The teacher should ask) opening questions as opposed to really biased questions, but occasionally when our arguments just get really one sided and form a total opinion which maybe we're having tunnel vision and don't see the other side of it, she has to ask questions which are slightly biased to open it up. (CS3 S3 354-57)

This student appears to be describing the difference between the types of questions the teacher asks to elicit students' views (in section 6.2), and those that she uses to challenge students' views (in this section).

Whilst in case study 1, the students believed that the teacher was expressing her own personal views, in case study 2 this was not the case. Each of the students interviewed felt that the teacher's motivation for challenging students' views was to 'broaden the argument' and increase balance, rather than to express her own views. This was the case even for students, such as Jake, who were continually involved in arguments with the teacher during lessons:

J: I think (the teacher) was helping to generate the argument more which is good, keeping giving new questions in. And also, me and Paul are quite domineering and so I think we sort of hangover some people, 'cause she kind of gave a kind a stance with the other group, against us - although whether she actually believes that I don't know - but it helped keep the argument going and keeping ideas flowing, which I think was good. Because if she'd backed our argument then I think the other people would sort of submit quietly, even if they didn't believe what we were saying. So I think it was a good way of generating ideas and bringing up new questions. I don't know whether she believed it or not, but I expect not! (CS2 Jake 2 50-59)

L: Maybe because the people who disagreed with me were more vocal, she was kind of more on my opinion but that was probably because the people in disagreement were talking louder and not really listening to anyone else. Had it been the other way round, I'm sure she would have appeared to be more biased in the other direction though ... I think she would try and make sure that we didn't have a complete tunnel vision of the concept and have a better overall view. So, whichever way, she'd just kind of widen what we thought. (CS2 Lara 2 31-40)

Unlike in case study 1, even those students against whom the teacher appeared to be arguing directly in the lesson, did not feel undervalued, or that their opinions were not being taken seriously.

In case study 3, the students said less about this aspect of the teaching and about the two extracts cited here. In one of them, only one student (George) was involved, and he was not one of the students that was interviewed, therefore his response to the teacher's use of the devil's advocate strategy is unknown. The students who were interviewed had mixed views about the teacher's comments about deforestation in the Lake District and in the less developed world:

H: This is where he does have an opinion. He always says - especially places like the Lake District - 'oh people go there and think it's a natural environment but it's not a natural environment, it's been manipulated by man blah blah blah'. And sometimes that can annoy me a bit 'cause it's like, well that's probably the most natural environment we've got so, alright, it's not a natural environment but come on, that was thousands of years ago that people were cutting down a few trees. It doesn't exactly make much difference. (CS3 Hannah 1 143-9)

R: That was quite a good point there actually. It's hard to argue with that one ... We were almost pointing the finger at them and saying 'you can't do it' when we've actually already done it - hypocritical, that's the word I'm looking for. Erm, which is quite a good point really, but then you can always look at it from the other point of view that we've done it and that was then but this is now. And now we know the impacts of doing it, surely we should be highlighting them as well ... But especially in third world countries, it's one of their main sources of income I presume. (CS3 Rufus 1 178-94)

M: All the developed countries are hypocritical because they've done it before, they've made their money, now they realise it was wrong so they're telling all the other countries not to do it. (CS3 Matthew 1 115-7)

In general the students felt that the teacher did express his own opinions in lessons, but did not impose his views on them. However, they did feel that he sometimes spent too much time talking about his own views rather than listening to students' opinions.

H: He does express his views quite a lot ... but I mean everybody has a view and he doesn't kind of try to project that on us ... he's not like 'oh this is my view and that's what I think'. He gets carried away sometimes, but ... we take it as a bit of a joke really. (CS3 Hannah 1 121-28)

S: If it's gonna be useful to us (the teacher should express his view) - although that's difficult to say because you don't know until you've said it - but ... there are lessons when he just talks and talks. It's all his opinion and he doesn't let us speak. (CS3 Sam 1 179-87)

Given the controversial nature of the subject matter, the students felt that it was important that the teacher should listen to what they had to say, and should not tell them that they are wrong.

Students in all three case studies had fairly similar views about what their teachers should be doing in their teaching about controversial environmental topics. Many felt that teachers should present them with both sides of an issue and leave them to make their own decisions:

S: Teachers should present you the facts and leave you to make up your own mind because I don't think it's right that someone should say, 'no this is how you should think', because everybody's different and they're gonna think differently. But if they say 'look, this is the advantages, this is the disadvantages, this is what's happening, talk about it' ... And the more information you gather, the more your opinion gets developed. And that way you're not influenced by anybody who's maybe biased or whatever. (CS1 S3 532-41)

D: We should have our own views
Je: I think they should give us both sides. I think they should give us both so that we can be allowed to decide for ourselves.
D: Yeah, because if they change our views, they may be going against our views which will sort of muck us up basically - understand? (CS2 S3 411-15)

R: If you teach and educate people for both sides, then they develop their own opinions about it so they can then take the information that they want for themselves and apply their own opinions to it or whatever. (CS3 Rufus 1 279-81)

Some students were sympathetic towards teachers expressing their own opinions, so long as their views were not imposed on the students and they were open to criticism:

A: I think teachers should be allowed to say their opinions but to make us think of our own opinions not to impose their opinions on us. (CS1 S3 193-5)

Al: (Teachers can express their own opinions) so long as they don't mind being criticised if somebody disagrees with it and wants to say something. I mean I think if they're going to say something, then they're saying it because they want other people to have a response to that, and actually have an opinion themselves. (CS1 S3 173-7)

Je: I think she tries to incorporate (her views) in the lessons and stuff, but she doesn't make you judge by what she says. I think she lets you have your own opinions and things. (CS2 Jenni 1 125-6)

Several commented that it might be difficult for the teacher not to bring in his/her own views:

S: I think it was her own point of view, so I think she probably wants to put that across, not that she wants us all to think like her, but because she thinks it's right so therefore she'll want to get it across ... It's difficult to take an opposing view if you think you're right. (CS1 SA1 283-92)

H: I guess it is quite hard really when you do have a very strong opinion of something to be able to teach it neutrally, I mean I guess that's what you're taught, being a teacher but I mean it has to come out sometimes, doesn't it? (CS3 Hannah 1 219-24)

These views about how the teacher should behave correspond remarkably well with the teachers' beliefs about teaching controversial environmental issues. The students clearly felt that teachers should be enabling the students to see more than one view of an issue, but that they should be cautious of offering their own opinions, in case they influenced the students. However, students from the different classes had differing views about how successfully their teacher achieved these aims:

A: She has her opinion, if your opinion is different, your opinion's wrong! I feel that's her attitude. (CS1 S3 204-5)

Je: She's not like totally forcing anyone into her view or anything, which is very good. (CS2 Jenni 2 153-5)

H: I don't think (teachers try to) change our views. I mean they wouldn't argue with us if we had a really strong opinion ... they give us all the information and they let us decide. (CS3 Hannah 1 255-9)

6.4.4 Advantages and disadvantages of the strategy

This strategy was much more widely used than might have been anticipated from the analysis of teachers' beliefs. Although the teachers espoused a view of non-intervention, they did actually intervene in discussions on a variety of occasions, sometimes quite forcefully. These interventions may reflect attempts to play devils' advocate, or illustrate their desire to encourage balance (by enabling access to a wide variety of views) at the expense of their aims for teacher neutrality (by not expressing any views themselves). However, in all except one of the examples cited, the views which the teachers support by their challenges appear to reflect their own views on the issue rather than a more clear cut devils' advocate (the exception being example vi). In the other examples, there appears to be a directionality in the teachers' challenges which is indicative of taking sides in the argument, and the teacher interview data support the notion that these reflect the teachers' own views. For example, in relation to example ii, teacher 1 explains:

"I think we should preserve the forest but I think we should pay a price for that. I think western nations, the rich countries of the world, the developed countries, industrialised countries should pay for that ... I think we should be actually giving over more of our GNP to aid and development, and we should be having an environmental tax or an environmental levy, country by country to help maintain the environment across the world. That's what I would like to see." (CS1: T2 460-7)[10]

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[10] See also the description of teacher 2's views about Greenpeace and Antarctica cited in section 6.2.4.

Therefore, whilst these challenges may have enabled the teachers to increase the diversity of views available to the students, it nonetheless appeared that they also had the effect of expressing the teachers' own views.

However, the intense debates that were seen when this teaching strategy was used, appear to refute the risk - suggested in many articles about teaching controversial issues - that students will automatically copy the teacher's opinions or will not be prepared to disagree with them. The evidence here suggests that, under a wide variety of conditions, at least a proportion of A level students will be more than willing to challenge the teacher's views in the most forthright manner. (The only case where this did not occur was under the tightly structured teaching conditions of case study 3, where student input was limited in many respects.) This willingness to argue with the teacher may again be related to the subject matter - because students feel they 'know' about environmental issues and have evidence from outside school (often the media), they are in a stronger position to challenge teachers' views than in other subject areas where the teacher is assumed to know best. However, the confrontational nature of such discussions - which often appeared to be exacerbated by the teachers' involvement - also meant that the opportunities for students to reconsider their own views or engage in reflection or empathy for others were limited (note especially examples i and iv).

It was noticeable that all three teachers sometimes used questions as a way of challenging students' views. The use of questions is perhaps unsurprising since it has been shown that questioning is the predominant technique in classrooms, and is especially common in curricula (such as geography 16-19) which emphasise enquiry (Dillon, 1982). Questions are deemed to, "stimulate student thought and discussion." (p. 128), but research evidence supporting this claim is described as, "ambiguous, to say the least" (p. 129). Edwards and Mercer (1987) argue that the role of teachers' questions is much more that of checking knowledge, checking that students have been paying attention, and defining the agenda for thought action and discussion - part of what they call the "discursive weaponry" available to teachers. Moreover, Dillon cites evidence which suggests that the use of questions may actually limit students' thinking, and elicit minimal and constrained responses:

> *"... by using questions teachers may unwittingly constrain expression of student thought, all the while hoping to enhance it. Especially during discussion classes, alternatives to questioning would appear more effective in stimulating student cognitive and expressive processes."* (Dillon, 1982, p. 140)

In considering the use of questions in therapeutic situations, Dillon notes that advice on eliciting feelings and opinions is completely opposite to the stance taken by teachers, who are ostensibly aiming for the same outcome. Counsellors are warned that, "by asking a question, the chances of a true expression of feeling are restricted", and that, "questions can be threatening, paralysing, and interpreted as an attack" (p. 138). Statements or silences are substituted for questions in this context, and are found to be effective in encouraging greater participation and longer responses.

This literature has interesting implications for the use of questions in the teaching of controversial environmental issues. Whilst questions are described as inappropriate for eliciting students' views, their use in the previous examples appears to serve a different function, much closer to the effects described above. Questions are used to encourage students to explain further, but are also used to express opposing views, or to persuade students to defend their own views (therefore they may in some sense be intended as an 'attack'!). (See for example section 5.4 - 'I just wanted a quick adversarial comment ... I just wanted to put her on the spot'). Many of the teachers' questions in this context were apparently not requests for information (as the teacher is assumed to know the answer), nor were they questions which aim to test students' knowledge, though these are common in school (since in this case the student is also assumed to know the answer). The questions used appear to be essentially rhetorical, apparently designed to express disagreement with the previous statement, rather than ask for information. They allowed the teachers to maintain their ideal of neutrality by not explicitly disagreeing with the students but at the same time allowed them to express strong (if indirect) disagreement. The students also seemed aware of the role of this type of questioning, describing it variously as 'sarcastic', 'spotting holes in their argument', 'making people question their arguments', and sometimes 'biased'. Although the teachers' challenging questions were often effective in eliciting a response from the students concerned, they may also have had the result of hardening up student attitudes, and limiting opportunities for more reflective thinking and consideration of different viewpoints.

It is the overlap between the teachers' use of statements and questions which make this teaching strategy particularly complex. The decision to categorise all of these examples in one group was a difficult one (see chapter 4 and appendix A2.7). An initial grouping differentiated between those extracts in which questions were used, and those which used statements (the latter being classified as 'expressing differing views'). However, on closer examination it appeared that - although superficially resembling different devices - both types of extract served the same function of

challenging students' views. Moreover, the boundary between the two original categories was too blurred to enable distinctions to be made due to the use of rhetorical questions which clearly acted as statements. Adding to the problem of classification is the fact that, in two of the examples (ii and v), the teachers' comments are challenges to views which had not been raised explicitly by students, but that the teachers perceived students to hold. Thus, example v is defined as challenging students' views, even though no students expressed their views in this extract. However, the teacher's description of this part of the lesson makes it clear that his remarks were in response to a view which he perceived the students to hold:

I'm fairly convinced in my mind, they make judgements about people acting in rainforests, and the sort of view, 'well they should stop it', and it's wrong, it's wicked of them to do it. But they don't see that they themselves contribute. (CS3: T1 251-3)

The categorisation therefore encompassed such extracts, which were held to be examples of the teachers challenging what they believed to be students' views.

The use of this strategy illuminated substantial differences between the approaches of the three teachers, and corresponding differences between the responses of their students to their challenges. Teacher 1 apparently aimed to provide a strong challenge to certain students' views, possibly due to her belief that students sometimes had 'simplistic' attitudes (see chapter 5), and should be encouraged to think about the implications of their views. This teacher seemed to be trying to encourage the students to empathise with the problems faced by indigenous people, challenging Sarah to think about the consequences of lack of formal land titles, and trying to make the students understand the problems of those who are less well off than they are. In both examples cited in this chapter, the students provided further arguments to defend their viewpoints, and the teacher was able to present a dissenting view through her questions and statements. This teacher took a strong stand on these issues and, in one extract, even commented that she was 'imposing her values' (line 104 below):

102 A: Mrs ***. All this is animals ... and it's my opinion, and it's not .. (unclear) .. freedom of
103 thought ..
104 T: That's fine. I know I was imposing my values on you 'cause I want you to start .. thinking
105 as caring human beings.
106 Andrea: You're not supposed to impose your values on us.
107 T: I know, I know I shouldn't do but I will occasionally .. 5 .. I have to get you thinking and
108 talking and discussing sometimes, so sometimes I will impose my view .. 3 .. or try to!
109 Cause it does get you talking. If I just accepted what you said and said nothing, no-one
110 would even think about it.

As well as her expressed desire to encourage debate, this position was apparently related to her perception of the views expressed by some students as prejudiced and unacceptable, which was a markedly different situation from the other case studies.

Teacher 2 also appeared to express quite strong views in some of the extracts. For example, on a number of occasions, she used rhetorical questions to refute a previous comment. In extract iii, the role of the teacher appeared to be to lead the students towards an understanding of nuclear testing as a potential threat to Antarctica, an understanding which was consistently challenged by Paul and Jake. The teacher's position was not apparently neutral - she was attempting to persuade them that there is a potential threat from nuclear testing in the face of their alternative position. That the students were aware of this can be seen from their more and more strenuous refusals to agree - the more she tried to persuade them, the more they refused to be persuaded:

34 Teacher: But aren't you basically .. Aren't you both basically saying then that if you're having
35 nuclear testing around that area, it's still likely to cause problems for the .. ecosystem?
36 (Murmurs from class)
37 Paul: No
38 Jake: No, not there. Not in the Pacific.
39 Teacher: You don't think it's got potential?
40 Paul/Jake: No, no potential. No potential. (laughter from students)
41 Teacher: OK, don't write it down then. // Vanessa, something else, another threat?

The teacher's reformulation of the students' comments (line 34-5) is particularly interesting as it appears to reflect an attempt to revert to her original lesson plan in the face of student disagreement. However, it is noticeable that she does not insist on their agreement, instead terminating the discussion with 'OK, don't write it down then' (line 41), suggesting an implicit acceptance of the controversial nature of the issue. Nonetheless, this abrupt termination of the discussion appears to reflect her discomfort with the direction the interchange had taken.

In addition, teacher 2 appeared to make explicit attempts to avoid imposing her views on the students, not only by withdrawing from arguments or using other strategies, but also by explicitly emphasising that the students would have their own views on the issue:

105 **302: 10.45** OK, and you need to consider - I mean obviously you've got your own
106 opinions - how strong their role should be in this, OK. Because they are involved in a lot of
107 lobbying - not just Greenpeace, any of these non-government organisations - erm, and I'm
108 going to give you an article in a minute on the earth summit in Rio ...

She also took a number of steps to try and distance herself from the argument on occasions when she felt that she was getting too closely involved (as evidenced in chapter 5). For example in extract iv, she explicitly distanced herself from her argument by stating that, "I'm not saying I believe this .." (line 202). She also closed the discussion by saying to Jake that he doesn't have to agree with her (lines 314-316), again accepting the plurality of views.

Teacher 3 used this strategy less during the lessons observed but nonetheless apparently felt it was important to challenge students to examine their views in more depth. He felt that they could sometimes be rather judgmental, especially about third world issues, and wished to challenge their preconceptions (see chapter 5). In example v, he is apparently trying to persuade the students of the importance of deforestation in western countries as well as in the third world, using an extended statement rather than discussion due to time constraints:

> Because I didn't want them to have too much time to do it, I was doing the skimming for them, and illustrating that ... when you do read an article, sometimes you just need to pick out the key points ... (CS3 T1 214-8)

A number of the students interpreted these 'key points' as reflecting the teacher's particular view of deforestation (an interpretation which was supported by the teacher interview data), and commented that his opinions were expressed quite a lot during lessons. However, this teacher also appeared to use the strategy of devil's advocate rather than expressing his own views, challenging a student to justify his opinion with a series of light-hearted questions. In this example (number vi), the teacher's questions are of a rhetorical nature but express such an extreme position that the student is unlikely to consider them to reflect the teacher's own beliefs. The teacher explained his aim that the student would 'take the line of thinking and explore it' (CS3 T1 284-5), but admitted that it was not, in this instance, entirely successful:

> I thought he might come back and be a bit more argumentative, and he wasn't so I let it go, rather than push him too hard. In fact I then moved on to something else ... if you push George too much, he'll go quiet on you. (CS3 T1 324-8)

The differences between the teachers' use of this strategy were reflected in the students' responses to it. In case study 1, the students objected very strongly to the teacher's intervention for a number of reasons, mainly because they felt their views had been misinterpreted, and they had not been given enough opportunity to have their say. In the other case studies, even students with whom the teacher had been arguing, generally felt that the intervention was beneficial and did not feel that the teacher's views were being imposed. Teacher 2's attempts to maintain a distance from

her arguments seem to seem to have been effective, as none of the students interviewed appeared to believe that she was stating her own views, despite the fact that several of them were aware that she had been supporting one side of the argument more than the other. They certainly did not believe, as the teacher had worried, that she didn't think their ideas were "creditable" (sic); in fact there is evidence that some students considerably over-estimated the extent to which the teacher agreed with their ideas. For example Jake suspected that the teacher was playing devil's advocate and that she secretly agreed with him ("I don't know whether she believed [her arguments] or not, but I expect not!"), and Dan described his own opinion as having "views for and views against", and suggested the teacher also had "mixed feelings" about the subject. Students in case study 3 were divided about whether they agreed with the teacher's view but did not object to him expressing it. Although not an area which was explicitly part of the research focus, these findings do hint at the potential importance of the teacher-student relationship, since some of the differences in student response to this teaching strategy appear linked to the way the teacher related to them (see 6.4.3).

In this strategy there is the most clear evidence of teachers trying to persuade students - perhaps to develop more positive environmental attitudes. This does not seem to be an intentional strategy, but is a likely outcome given the rhetorical nature of controversial environmental issues. The students express their own views, often vociferously and sometimes taking extreme positions, and the teacher who does become involved in such a discussion is unlikely to be able to avoid revealing their own attitudes towards the issue, in a direct or indirect manner. However, it should be noted that in none of the cases where teachers challenged students' views was there any evidence that students actually changed their views as a result. For example, in relation to example i, the comments of a key protagonist after the lesson suggest that the teacher has not succeeded in changing his view:

Al: Well that's my belief about nature and everything, is that we are part of nature, so what we're doing to the environment is going to happen anyway because we're just part of nature, it's just another step in what's going on. And yes, I'm not sure where the actual survival of the fittest comes into it, but if it's the tribes people and them becoming extinct, or if it's the trees becoming extinct then that's just nature and I don't agree with it fully, being all chopped down and everything, but I mean things will return. If the trees get chopped down, grasslands or something else growing up, it's just another evolutionary progression, I suppose. (CS1 Alex 1 38-47)

Similarly, in relation to extract iii, Jake, who had been arguing with Paul that nuclear testing would not threaten the Antarctic environment, defends his view:

J: Well, Miss **** tried to put it across to us that (nuclear testing was a threat) but I think, although I'm sure there will be some sort of fall out - although it is underground - I think there must be some effect on the marine life but then again everywhere on the globe is affected by nuclear testing, and so I don't think it will be overly threatened by nuclear testing. (CS2 Jake 1 68-73)

Moreover, the lesson transcripts themselves indicate that teachers often terminated discussions by accepting a diversity of possible viewpoints. It was also noticeable, in both case studies 1 and 2, that the more the teacher challenged a student's views, the more extreme and stubborn the student appeared to become. One can only conclude that the more a teacher tries to specifically change students views, the less effective it is likely to be. (Clearly, however, the long term effects can not be recorded in a study such as this.) Jones (1988) comments humorously on this aspect of teaching when he remarks:

> *"A similar public challenge from a teacher may well have provide counter-productive and served to harden up beliefs and polarise positions. In my most cynical moments I believe that the quickest way to get children to do or think something is to tell them <u>not</u> to."* (Jones, 1988, p. 91)

These issues will be discussed further in chapter 7.

6.5 Conclusion

Chapter 5 suggested that the three teachers shared similar beliefs about the importance of a balanced approach in teaching about controversial environmental issues, but identified a possible dilemma in their understanding of the notion of balance. This chapter has considered three strategies used by the teachers in their attempts to resolve this dilemma, and described their use in different situations. Each strategy was used by at least two of the three teachers; however, there were significant differences in the ways in which they were used. These differences between the teachers appear to reflect differences, hinted at in chapter 5, between their beliefs about the value of students' knowledge, their concerns about outsiders' views of their classroom; and their aims in challenging students' comments. In addition, the differences between the teachers were reflected in the students' responses to, and evaluation of, the strategies.

Both students and teachers shared similar beliefs about the ideal strategies which should be utilised in teaching about controversial environmental issues, but students from different case studies varied in their evaluation of the teacher's effectiveness at achieving this ideal. Examples from all three cases suggest that attempts to maintain a balanced position proved problematic, and that levels of balance and involvement varied depending on the situation. Although all the teachers expressed a preference for the role of balance in lessons, the classroom data show them taking on much more

flexible roles as the circumstances of the lesson vary, even within one particular discussion. The teachers' actual positions reflect a mixture of neutrality, balance, commitment and devil's advocate (as described in chapter 2). Factors which might influence the strategy chosen include the subject matter being taught; the knowledge and interest of the students; the relationship between the teacher and class; the perceived time and syllabus constraints; and the skills and knowledge of the specific teacher. These issues will be discussed further in the concluding chapter.

It seems that teaching controversial environmental issues raises a number of pedagogical challenges for teachers, and requires very different classroom management skills from those usually observed. The teachers in this study responded to these challenges in an imaginative and inventive manner, adapting teaching strategies to encourage student involvement in discussions and producing lively, interesting lessons. Teaching about controversial environmental issues has the potential to provide new opportunities for innovative teaching, increased student participation in control over the content and direction of lessons, and increasing use of students' prior knowledge and expertise. The three teaching strategies described in this study all helped the teachers achieve their aims to some extent. But equally, all had some disadvantages. No one strategy was universally more successful than others, therefore it seems sensible for teachers to be flexible about their use, depending on the specific circumstances encountered:

> *"It is simply not possible to lay down hard and fast rules about teaching controversial subject matter to be applied at all times. The teacher has to take account of the knowledge, values and experiences which the students bring with them into the classroom; the teaching methods which predominate in other lessons; the classroom climate (e.g. unquestioning consensus, apathy, or polarisation of opinion); and the age and ability of the students ... These different circumstances in the classroom require different methods and strategies and there is no guarantee that a strategy which works with one set of pupils will necessarily work with another group."* (Stradling et al., 1984, p. 11)

Chapter 7: Conclusions
The possibilities and problems with teaching controversial environmental issues

7.1 Introduction

The aim of this chapter is to move beyond the specific beliefs and practices of the three teachers in this study, to identify key issues relating to the possibilities and problems with teaching controversial environmental issues which might be of interest to other teachers of geography. The potential implications for teacher education and curriculum development, both in geography and other curriculum areas where controversial issues are taught, will also be considered. In intending to provide a more general understanding of this area from the study of three teachers, careful note should be made of the issues relating to validity and reliability, discussed in chapter 3 and the limitations of the study considered in section 7.5. Although the identification of general features between the case study teachers may potentially provide useful insights for other teachers, great care must be taken when postulating more general understandings from the study of these three teachers. Any generalisation suggested is not of a statistical nature, but rather relies upon so-called 'theoretical inference' (Foster et al., 1996) whereby the cases studies are understood in terms of theoretical categories which provide insight into other, similar cases. Such generalisations are intended as "... hypotheses to be carried on from one case to the next, rather than general laws to be applied across a population" (Brown and McIntyre, 1993). The aim therefore is to provide a provisional understanding of this area which encompasses the results of this study and which is open to further study and testing in future research. Such an understanding makes explicit and visible some of the possibilities and problems with teaching controversial environmental issues.

The analysis of teachers' beliefs and practices presented in this thesis raises two key issues in relation to the literature on environmental education and teaching controversial issues. The first concerns the differences between the environmental education agenda as espoused in a wide variety of documents and discussed in chapter 2, and the beliefs and aims of the teachers in this study as described in chapter 5. These differences are discussed in section 7.2 below. The second issue relates to the difficulties which all of the teachers experienced in enacting their own beliefs about teaching controversial environmental issues in the reality of the classroom. As suggested in chapter 1, given the complexity of the classroom situation, some divergence is to be expected between teachers' beliefs and actions but the extent of the difficulties encountered suggests that

there may be specific constraints related to teaching controversial environmental issues (discussed in section 7.3). Section 7.4 considers the implications of the findings in terms of both curriculum development and pre-service and in-service teacher education, and section 7.5 discusses the limitations of the study.

7.2 Teachers' beliefs and the environmental education literature

As mentioned above, this study reveals clear differences between these teachers' beliefs and the espoused aims of the environmental education literature. It is clear that whilst much of the literature (including, to some extent, the 16-19 syllabus which the teachers were following) advocates a radical environmental agenda in terms of the promotion of positive attitudes towards the environment, this agenda is not shared by these teachers. In fact their intention is apparently to avoid influencing students' attitudes, or imposing any kind of pro-environmental agenda. Rather than such a 'committed' approach, they appear to subscribe to a notion of balance, which entails 'balanced learning' on the part of the students (see chapter 2). Balanced learning does not necessarily involve teacher neutrality, or even necessarily balanced teaching, although these may be intended in certain situations. The key element of balanced learning is that students should be exposed to a variety of different arguments, with these arguments being presented either by the teacher or by the students (often encouraged by the teacher), from which they develop their own views. Although sharing with it a desire not to express their own values, this view of the teacher's role is quite different from the neutral teacher as advocated by the Humanities Curriculum Project, in that it may include challenging the views expressed by students in order to enable a wider variety of arguments to be aired in the lesson. It was notable, however, that 'challenging' students' views was conceptualised by these teachers as substantially different from 'changing' their views.

There are a number of possible explanations for the observed differences between the beliefs of these teachers, and the aims of the environmental education literature. In general, it seems that the teachers have to take account of a much wider variety of factors than those which are simply EE based. Unsurprisingly, external examinations were considered to be of central importance, especially at this level of education, and exposure to a wide range of arguments was seen as crucial in enabling the students to cover issues in sufficient depth for the exams. Thus, the discussions which arose in class appeared to reflect the examination agenda of developing a broad-ranging understanding of differing attitudes and values, rather than the more personal consideration of environmental attitudes and values advocated in the EE literature (and in places, in the 16-19 syllabus). Moreover, the controversial nature of the issues meant

that the teachers had to take account of outsiders' views of the classroom (other teachers, parents, or governors), and be aware of the possibility of accusations of indoctrination. This issue emerged as another major pressure on teachers, perhaps becoming increasingly important in the current climate of external judgement and competitiveness between schools.

At a deeper level, the observed differences between the teachers' views about teaching controversial environmental issues and the espoused aims of the environmental education literature may stem from differences in philosophical origin. Beliefs about independence of thought and avoiding imposition of values are deeply embedded in liberal educational thinking, whilst the origins of environmental education are rooted in the political movement of environmentalism, a movement which is based on a desire for specific behavioural outcomes. Moreover, the philosophy of independence appears to play a substantial role in sixth form teaching, both in terms of independent thought and independent learning. However, this philosophy was apparently interpreted in rather a narrow way by these teachers as indicating that they should not express their own views, or risk imposing their own values. Furthermore, not only were they concerned to avoid expressing strong commitment themselves, but two of the teachers felt that students who expressed strong views were also problematic (see 5.2 and 5.5). However, this insistence on all students considering the full range of viewpoints could be viewed as merely demonstrating their strong commitment to liberal values over and above anything else! Within this belief structure, there is little possibility for radicalism in environmental education or elsewhere.

In line with these beliefs, the teachers either did not consider, or did not wish to take on, the role of moral guide, helping students to make moral and ethical decisions, as suggested in some environmental education literature (see Fien, 1992: Elliott, 1993). This apparent moral relativism with respect to controversial environmental issues, whilst avoiding the potential charge of indoctrination, led to a situation where the students were given no particular help in coping with the diversity of values. A number of comments made by the students suggested that they were confused by the multitude of different opinions considered, and were unable to resolve these issues themselves. For example, several of the students mentioned an increased feeling of powerlessness in the face of their growing knowledge about the complexity of environmental problems:

L: I think it's so difficult to form a total opinion from the amount of information we're given. I mean we're given a lot, but because it's so impartial either side, you know, there's an equal amount either side, it's really difficult to decide ... you see there are problems either way, and they can't, in the end, be really fixed. (CS2 Lara 1 176-85)

Moreover, as will be discussed later, the fact that the teachers aimed to avoid expressing their own values did not prevent this from occurring on occasions. A possible compromise position is for teachers to encourage students to consider the significance of holding different environmental attitudes or values, and to explore the consequences of holding those values, whilst maintaining tolerance for a diversity of opinions. However, the encouragement of tolerance should not be used as a justification for not holding firm beliefs.

Whilst there were clearly a number of constraints acting upon the teachers which prevent a more radical agenda being pursued (discussed further below), it is also clear that these teachers simply did not subscribe to the transformational view of environmental education which underpins much of the writing in this field. Their aims when teaching about environmental issues did not include 'fostering', 'reinforcing' or 'developing' students' environmental attitudes (or even enabling environmental decision-making in any depth). Of the two aims expressed in much of the environmental education literature, these teachers expressed a far greater level of support for encouraging intellectual independence than for promoting positive environmental attitudes. They believed that students should come to their own decisions about environmental topics and should not be influenced by the teacher. This suggests that any attempt to introduce a more radical environmental agenda into schools by making changes to the curriculum will not succeed unless teachers can be convinced that it is desirable. Similar problems are likely to accompany other curricular changes, most notably the current increase in emphasis on citizenship in the National Curriculum. To this degree, the current study adds support to a wide body of literature regarding different areas of the curriculum, in suggesting that unless curriculum developers take account of teachers' beliefs in the designation of new curriculum materials, these are unlikely to be implemented in their intended format (e.g. Hargreaves, 1989; Ball and Bowe, 1992; Brown and McIntyre, 1993) The current position, identified by this study is that these teachers' understandings of environmental education are in conflict with their beliefs about the teacher's role in general. Their beliefs about the teacher's role therefore take precedence over the more radical aims of environmental education, even where these are specifically advocated by the syllabus.

7.3 Enacting beliefs about teaching controversial environmental issues

A second issue highlighted by the findings of this study relates to the difficulties which these teachers encountered in trying to enact their beliefs about teaching controversial environmental issues in the classroom. In chapter 1, the possibility of divergence between teachers' beliefs and practices was considered in the light of - often unpredictable - classroom realities which impinge upon the teaching situation. Chapters 5 and 6 provide illustrations of some of the ways in which beliefs may differ from practices in real-life teaching situations, and hint at potential causes of these differences. The analysis of the teachers' beliefs in chapter 5 suggested that all three teachers aimed to provide a balanced argument in their teaching about controversial environmental issues. It also revealed a tension within this notion of balance, requiring them to encompass the twin aims of providing access to a variety of different viewpoints, whilst not expressing their own views or becoming too involved in classroom discussions themselves. However, the lesson transcripts demonstrate how difficult it was for the teachers to maintain this form of balance, and the analysis of classroom practices indicates that the actual levels of balance and teacher involvement in discussions varied considerably depending upon the circumstances (see chapter 6).

In order to understand why these differences might arise, a number of possible causes will be considered. Carr and Kemmis (1986) discuss the importance of 'subjective' and 'objective' constraints on action:

> *"... they recognise that there are 'objective' aspects of social situations which are beyond the power of some particular individuals to influence at a particular time and that to change the way people act it may be necessary to change the way these constraints limit their action. At the same time, they recognise that people's 'subjective' understandings of situations can also act as constraints on their action, and that these understandings can be changed."*
> (Carr and Kemmis, 1986, p. 183)

Whilst the division between subjective and objective constraints is often not clear-cut, consideration of the kinds of constraints that might influence teachers' actions may help understand the difficulties encountered by these teachers in their attempts to enact their beliefs in the classroom. The discussion below therefore examines the possible constraints on action suggested by this study.

i) Syllabus and exams

As discussed briefly above, the over-riding importance of the syllabus and examinations was viewed as a substantial constraint on the teachers' actions. Whilst the geography 16-19 syllabus clearly provided many opportunities for teachers to include controversial environmental issues in their teaching, the structure of the course and its examinations appeared to limit the ways and extent to which these issues could be explored. In particular, it seems likely that issues of time are of paramount importance in encouraging divergent thinking (eliciting and considering a diverse range of opinions). Such thinking requires different kinds of social interactions from those normally observed in classrooms, and sufficient time must be available for serious engagement with the issues (see Dewhurst, 1992; Geddis, 1991). For example, whilst the teachers' beliefs reflected the examination requirement that students should be able to articulate a variety of different arguments from differing value positions, they were constrained in their analysis of these arguments by the perceived pressure to complete a pre-set syllabus. The frequent lack of in-depth analysis of attitudes and values may be easily understood in the context of restricted classroom time and extensive material to cover. Possibilities for students to engage with the more complex issues were limited, resulting in a debate which was commonly reduced to a summary of differing points of view, allowing for little in the way of a critical examination of the respective positions. These constraints were compounded, for one teacher in the study, by pressure exerted by the students themselves who were highly aware of the importance of their A level examinations. In order for students to be able to voice their opinions in a considered way, a substantial amount of time would be required, and this simply was not available in the context of the A level syllabus.

A key aim when teaching about controversial environmental issues, expressed both in the literature and by the teachers in this study, is that students should gain intellectual independence. However, it appears that the influence of the syllabus may actually reduce the possibilities for students to engage with personal decision-making in an independent manner. Lessons were frequently bounded in terms of syllabus key ideas, thereby limiting the range and scope of any possible discussions. Moreover, the singular emphasis on enquiry learning of the 16-19 syllabus, which was supported strongly by the teachers, may disguise forms of questioning which tightly control the discussion even whilst apparently open-ended in nature (see chapter 6). Evidence from this study suggests that whilst strenuous attempts were made by the teachers to achieve a classroom environment in which students could make considered decisions about difficult issues, the importance of teacher control over content for examination purposes led to a situation where students were limited in their ability to gain intellectual independence.

It should be noted that the 16-19 syllabus was selected for study because of its explicit focus on the more controversial aspects of environmental issues. This syllabus specifically encourages teachers to consider attitudes and values, even to the extent of their inclusion as a key part of one of the exams. It also, in one part of the syllabus, suggests that students should have, ".. the opportunity to clarify and develop personal values in relation to environmental questions, issues and problems" (ULEAC, 1996).It seemed likely, therefore that this would be a fruitful context for the observation of radical teaching of controversial environmental issues. However, even within this context, the boundaries set by the syllabus apparently placed limitations on the amount of time that could be spent in considering issues concerning personal or ethical decisions. Such issues were touched upon by all teachers in this study; however, the more personal aspects were frequently downplayed, in part because of lack of time for in-depth consideration, and in part because of the need to teach towards a specific examination. The nature of teaching to a prescribed syllabus meant that the teachers had planned their lessons - in their head, if not formally on paper - and therefore started out with a path for the lesson to follow which would have been severely disrupted if students had got too involved in expressing contrary or unusual opinions which may not have conferred significant benefit in the exams. This caused the teachers to occasionally 'lead' lessons to a pre-planned conclusion, thereby reducing the opportunities for free expression and debate of opinions. It can be hypothesised that, for teachers of other syllabuses in which the role of attitudes and values is given a lower emphasis, the situation would be even more constrained, although this would merit further research.

ii) Students

A study by Brown and McIntyre describes students' behaviour and characteristics as a key influence on teachers' actions. Variables described by the teachers in their study included ability level and motivation of students, attention seeking, noisiness, and other disruptive behaviours (Brown and McIntyre, 1993). Similarly, it is clear that the strategies utilised by the teachers in this study required students to respond in particular ways in order to succeed. Confident, articulate students were able to play a full role in these lessons, but others were less able to do so. Moreover, the influence of students' actions on the nature of lessons on controversial environmental issues can be seen in many of the extracts quoted in chapter 6. There is evidence of students influencing lessons in a variety of different ways, acting as a conservative force with their transactional view of teaching; encouraging lively debate in their desire for interesting, fun lessons; or drawing the teachers away from their ideal of non-intervention with extreme or outrageous remarks. Particularly noticeable in this study was the way in

which students frequently acted as a constraint on the teachers' aims of non-involvement in lessons. Dominant students, reticent students and an excessively aggressive atmosphere could all reduce the potential for effective student discussion without teacher intervention. There were several occasions when students expressed extremely strong opinions and showed little willingness to consider alternative positions. One or two students dominated the arguments, leaving the opposing view largely un-said as other students hesitated to get involved. In the reality of the classroom, therefore, balance for these teachers had to entail getting involved in the debate rather than observing from the sidelines or taking the role of neutral chair.

At times, the students and teacher appeared to lack a shared understanding of the aims and purpose of the lessons. Evidence of students' transactional view of learning can be noted in some of the remarks made following classroom discussions. It was clear that many of the students felt that discussions had veered from the central purpose of the lesson and failed to see the importance of a lesson in which the teacher was not imparting facts. Even where the teacher saw these debates as important in terms of syllabus understandings, this was frequently not appreciated by the students, who felt that the discussions were irrelevant to their exam learning. On other occasions, student involvement in discussions appeared linked to a desire for interesting, enjoyable lessons. Some students expressed opinions which they did not apparently hold themselves, with the aim of encouraging a lively debate, and there was little evidence of serious consideration of other people's opinions (see chapter 6). These discussions were frequently confrontational, the aim apparently being to 'win' the argument rather than to understand or empathise with other points of view. Even if the teacher had intended a serious in-depth discussion of the issue, certain types of student involvement limited the possibility of this occurring. It also appears that the students did not always have the requisite skills to engage seriously with the issues, and that the teachers did not make clear the ground rules for this kind of discussion.

There are hints that the relationship between the teacher and the students may have been important in influencing both the teaching strategies used and, particularly, the students' responses to those strategies. The value placed upon students' prior knowledge and opinions by the teacher determined to a large degree the extent to which student involvement in discussions was encouraged and valued. Moreover, the relationship between the teachers and their students appeared to influence the ways in which students evaluated the lesson and the teachers' role in it. This was articulated by one of the students in this study in terms of their respect for the teacher:

S: .. I think because he's so relaxed, we respect him more, than if they stand at the front and say, you know, 'well this is this and that is that and I'm your teacher' and everyone goes 'ugh', you know, 'cause you think, well I'm not working under you. (CS1 SA1 224-7)[1]

This suggests that if teachers are successful in achieving a relaxed relationship with their students, they are more likely to be perceived as enabling discussion, rather than being criticised for attempting to challenge students' opinions. They may also be perceived as providing a more balanced view of the issue. Previous research has demonstrated the influence of classroom environment on cognitive outcomes, and other literature suggests that the classroom atmosphere may affect the quality of discussions (see Fraser and Wubbels, 1995; Reid, 1989). Creating a learning environment in which discussion can be fostered appears to be a necessary condition for engaging in the kinds of enquiry which the environmental education literature advocates, but may be difficult within the current context of schooling. However, this is another area which would benefit from further research.

iii) Content

Variety in the content or subject matter of the teaching is also mentioned by Brown and McIntyre as influencing the nature of lessons. In their cross-disciplinary study of teachers, Brown and McIntyre noted that the nature of the material as new, interesting, or unusual might lead the teacher to use different strategies to those normally engaged in (Brown and McIntyre, 1993). Furthermore, they suggest that teachers may be constrained by the need to cover content, an issue which was particularly pertinent for one of the teachers in this study, who felt that his actions were severely constrained by the need to cover material which had been taught poorly by a student teacher. However, whilst the other teachers were also constrained to some extent by sheer volume of content, the most noticeable influence was in the degree to which they tolerated differences of opinion depending upon the subject matter. It appears that some issues - especially those which involved race - were considered non-negotiable, and imposition of the teacher's views was therefore acceptable. This was apparently related to the teachers' view of racial matters as less contested than environmental issues - reflecting the widespread condemnation of racial prejudice in the general population. With such an issue, the forcefulness of any challenge to students' arguments could clearly be considerably greater, and the aim of balance was pushed aside as irrelevant.

However, in drawing the line between those values which they felt justified in promoting and those which they did not, these teachers were required to address a problem which permeates all teaching. Haydon states:

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[1] This comment refers to another teacher at the case study 1 school.

> *"Just where the line is to be drawn between the responsibilities for their pupils' values which educators in a plural society must take on, and the partisan commitments which they must hold back from promoting, will probably be a matter for continual debate and modification in such a society."*
> (Haydon, 1997, p. 129)

However, in contrast to some writers in environmental education, the teachers in this study were generally in agreement that most environmental attitudes or values fell into the category of 'partisan commitments' and that they were not widely enough agreed upon in the general population to justify their inculcation as moral values. Therefore, unless the subject matter encompassed issues of racism, the teachers did not feel that they were responsible for the environmental attitudes and values of their students.

iv) Teachers' knowledge

The findings of this study suggest that the influence of teachers' content knowledge on their teaching about controversial environmental issues is extremely complex. Shulman asserts that all teachers require a considerable level of subject content knowledge to teach well (Shulman, 1987). Moreover, the literature on teaching controversial issues suggests that teachers require a very high level of current subject knowledge, of an inter-disciplinary nature, in order to teach about controversial issues effectively (see e.g. Stradling, 1984). The controversial nature of environmental issues suggests that teachers need a wide knowledge of related economic and political issues, together with a philosophical understanding of teaching subjects which involve differing ethical positions. However, the findings of this study suggest that there may also be more subtle issues related to teachers' confidence in their own knowledge, and indeed their view of knowledge itself, which may have a strong influence on their teaching about controversial environmental topics. These issues are linked to the value placed by teachers on students' prior knowledge, although the precise effect of each is unclear.

Teachers 1 and 3 both exhibited a high degree of confidence in their own knowledge about current environmental issues, with teacher 1 especially expressing a deep interest in all geographical topics, and indicating that she kept informed by reading current journals. According to the literature, this high level of knowledge should be viewed as a major advantage when teaching about controversial issues, and indeed it seems highly likely to confer some benefit. However, given the difficulty of identifying appropriate subject knowledge when the 'facts' of many environmental issues are in dispute, it is also possible that these teachers' confidence in their own knowledge is unwarranted, leading to an excessive emphasis on one particular version of the facts which may be

debatable. These two teachers also displayed a somewhat critical view of students' prior knowledge, considering students to be ill-informed about many environmental issues, and having simplistic understandings. Whilst this is undoubtedly the case for some students, it may be difficult to judge whether students have a genuinely inadequate understanding, or whether they merely disagree with the teacher's interpretation of the issue.

Teacher 2, on the other hand, displayed something of a lack of confidence in her own subject knowledge of current environmental issues. This lack of confidence may be related to genuine limitations in her knowledge, and indeed there was at least one occasion in a lesson where she seemed uncertain of how to proceed (see below). However, her status as a relatively young and inexperienced teacher may also have enabled her to be more critical of her own teaching than were teachers 1 and 3. In relation to the extract on nuclear testing (see Appendix 3.4), teacher 2 explains her inability to intervene in the argument in terms of her perceived lack of knowledge about the issue:

"I think I could have thought it through a lot more ... I would have liked to have interjected and said, 'no this is how it would have got there', and been a bit forceful about it. Although actually it wasn't something that came up in the notes, I think it was something that somebody suggested, so at the time you're thinking, 'is this likely to be a threat well yeah it probably is', but then you perhaps don't have the back up to be able to say 'yes it has definitely'. So if I'd have been a bit more prepared for it, and just about nuclear testing in the area generally, then I'd have been able to be more forceful." (CS2: T1 390-9)

In this case, the complexity of the subject matter meant that the teacher was unsure about the status of knowledge claims made by the student and was therefore uncertain as to how to respond. This is a particular problem in relation to environmental issues, in the context of extensive media coverage which may have led students to believe that they are already well informed about such matters. Challenging the confident claims of such articulate students requires an extremely high level of content knowledge and pedagogical skill, which in this situation, the teacher felt she lacked.

However, this teacher's concerns about her own level of knowledge may have also conferred an advantage in other situations. Doubts about her knowledge of some of the more current environmental issues did not prevent her from addressing such topics and she was extremely open to listening to students' views, and valued the insights that they could bring to a discussion. As discussed above, a high level of confidence in knowledge claims about environmental issues may be inappropriate in the context of widespread uncertainty, strongly held opinions, and scientific debate. It may be that

this teacher was more sceptical about her own level of knowledge in the light of a view of all knowledge as being somewhat provisional and value-laden:

".. perhaps I don't always feel that, even though I am fairly informed ... you never know what goes on higher up do you? So no-one is completely informed to be absolutely 100% sure of what's right and wrong and the way it should be dealt with." (CS2: T3 652-5)

This approach has potential benefits for the teaching of controversial issues, in which the certainties that accompany much curricular material do not apply. Such a view of knowledge as provisional and open to dispute may also have made her more open to listening to students' views and ideas. Nonetheless, the practical limitations to such a stance, in the context of an A level syllabus requiring coverage of a large quantity of fixed material, are clear.

Very likely, the ideal position lies somewhere between the two extremes. Clearly, a high level of subject knowledge is desirable for all teachers, and teaching about environmental issues is no exception. Achieving this level of knowledge however may be difficult, since it necessitates a familiarity with the most current research in the environmental field which changes rapidly. Controversial environmental issues are particularly problematic in that the boundary between facts and values may be poorly defined. This is crucial to teachers who believe that they must correct a factual inaccuracy, but should not get involved in a matter of opinion, or enforce a particular version of the facts which may be open to debate. In the light of these issues, it is of central importance that teachers retain a healthy scepticism for all versions of the facts about controversial environmental issues, including a critical view of the adequacy of their own knowledge base.

v) Teacher's pedagogical skills

A major issue raised by this study is the extent to which teachers have the skills to implement the type of curriculum envisaged by the developers of geography 16-19. The founders of this course emphasised the need for a new type of education in which students learnt, ".. skills of enquiry and critical analysis" (Naish et al, 1987 - see chapter 1). The syllabus also refers to a number of goals related to understanding, clarifying and developing personal values (see chapter 2). However, the pedagogical skills required to implement such prescriptions are highly complex. Teachers are required to avoid over-simplification of the issues, and yet make them comprehensible to students in order that they can address exam questions. They must encourage students to express their own views, to question their own and others' views, and to allow for the possibility of changing their views in the light of new evidence. In considering controversial environmental issues, students are required to engage in

philosophical, rather than geographical discourse, in which the issues under consideration may not be open to final resolution. In discussions, teachers therefore need to negotiate a careful line between being overly involved and controlling, leading to an imposition of their own views, and being so uninvolved in the discussion that dominant students control and impose their own views instead. This balance may be very hard to achieve and teachers who are not confident about their own abilities may choose strategies which limit the controversial aspects of environmental issues, or may attempt to teach them in their usual style.

The results from this study indicate that the types of discussion which are advocated for teaching controversial issues (described in chapter 2) are not always achieved in the reality of the classroom. There is evidence that the teachers in this study found it extremely difficult to operationalise the concept of discussion, and encountered a number of the potential problems which were considered in the overview of literature relating to this area. Discussions frequently appeared to be unplanned and with little structure, arising spontaneously during the lessons. Furthermore, limited use was made of external evidence in any discussion; polarisation and angry, fast-paced exchanges of view were common; and extreme statements not unusual. As Haydon explains:

> *".. there is an ideal of reasoned discussion that is more difficult to achieve, and less commonly realised, than may be thought at first sight."* (Haydon, 1997, p. 142)

Haydon argues that pupils should not just exchange views, but should put forward reasons for holding those views. This may take them further in understanding other people's points of view than a superficial exchange of opinions. However, it is not sufficient just to undertake a debate in which each side tries to undermine the other's credibility (as appeared to be frequently the case in this study). Reasoned discussion, according to Haydon, needs appropriate conditions, including the explicit definition of ground rules, preferably set up with the assistance of the students so that they both understand and appreciate the need for them. However, there is little evidence that this ideal of reasoned discussion was being achieved by any of the teachers in this study.

Teaching controversial environmental issues also introduces a conflict within the normal rules of interaction in the classroom. These rules state both that the teacher controls what knowledge is deemed acceptable and relevant, but also that the teacher cannot enforce his/her view on the students, where the facts are unclear or where values are involved (Edwards and Mercer, 1987). Teachers therefore have to steer a line between these two aims, resulting in the complex attempts to control classroom

discussions without appearing to do so, which were seen in this study. Moreover the teachers' usual position as a provider of facts may limit the extent to which they are able to relinquish control in the discussion of controversial issues. The problematic nature of much of the information relating to environmental issues may provide difficulties for teachers, suggesting the necessity of eschewing the search for a single right answer. By way of making discussions less teacher-directed, students may have to challenge the teacher's views, as well as other views presented in the lesson, although this is a role that both teachers and students may find difficult to accept. In this study, it was noticeable that all teachers used a different style of teaching when considering the more controversial aspects of environmental issues. In general, there was greater acceptance of a diversity of possible answers, and a lower use of techniques which entailed the teacher leading students to a pre-planned conclusion. To some extent, these changes were enforced by the students, who challenged any preconceived notions the teachers may have had, and encouraged a greater negotiation of content. This negotiation of content is especially important in teaching controversial issues where knowledge claims are often open to question, but the new role may be difficult for teachers to take on:

> *"(This is) a negotiative depiction of education, a rhetorical, argumentative meeting of minds in which what is 'known' is merely what is claimed by somebody: it is open to scrutiny ... we have commented on the difficulties teachers may face in achieving these aims."* (Edwards and Mercer, 1987/ p. 164)

vi) Teachers' attitudes

One issue which stands out from the analysis of the teachers' beliefs and practices in this study, is the difficulty which all teachers experienced in implementing their beliefs about limiting involvement in classroom discussions. Internal contradictions within the teachers' beliefs were problematic with respect to the aim of exposing students to a range of different viewpoints, whilst avoiding giving support to any particular position. There were elements within the teachers' belief structure which appeared to imply support for the neutral teacher, but this stance proved very difficult to maintain. In contrast to their espoused beliefs about not expressing their own viewpoints, the classroom data suggest that the influence of the teachers' own environmental attitudes was greater than they either intended or, in all probability, realised. Moreover, in line with the findings of Geddis, 1991 (see chapter 2), there were occasions where the teachers' intent appeared to be persuasion rather than instruction. Their desire not to get involved in discussions or to express their own views, frequently led to the situation where these views were expressed indirectly in the form of questions, or by control of students' turns in discussion. Whilst these strategies enabled the teachers to avoid

explicitly stating their views, such an indirect expression of attitudes may have been harder for the students to challenge than a direct argument presented by the teacher.

A number of reasons can be suggested for the difficulties which these teachers encountered. Firstly, the immediacy of the discussions which were documented in this study made the opportunities for reflective action extremely limited. Fast-paced exchanges of view were a common feature of these discussions and, in such a context, the teachers had little time to provide a considered response to students' remarks. Moreover, if the argumentative nature of attitudes is considered, the possibility of a discussion about controversial issues in which one party does not express any attitudes appears an impossibility. According to Billig, the very nature of attitudes places them as positions in a debate:

> *"Holding a view on a social issue involves taking an argumentative stance in relation to counter-views ... In this sense one would expect the discourse of views to be an argumentative discourse."* (Billig, 1991, p.171)

If this description of social attitudes is accepted, it appears impossible that teachers could teach about a controversial issue without in some way expressing aspects of their own attitudes about that issue. Controversial issues, by definition, involve conflicting attitudes or values, and their rhetorical nature suggests that teacher neutrality is likely to be impractical and unhelpful in exposing students to the full range of viewpoints. Students in this study often expressed firm views about environmental issues which, if left unchallenged, would have led to a very limited view of the issue being presented.

This analysis therefore suggests flaws in the positions both of neutrality, and of balance, as advocated in the literature on teaching controversial issues, and suggests that teachers have to choose between explicitly and implicitly expressing their attitudes, rather than the false dichotomy of advocating their views or concealing them from the students. Whilst it is commonly stated that no teaching is value-free, many teachers may be unaware of the ways in which their own attitudes and values are manifested and transmitted through their teaching practices. Environmental attitudes can be viewed as one aspect of the 'hidden curriculum' (Jackson, 1968), that part of the learning experience which is determined by the teacher's attitudes and behaviour rather than by a formal syllabus. Whilst most teachers will be aware of the existence of a 'hidden curriculum', they may not understand the forms in which it might be transmitted through their teaching. This study, through looking in detail at some of the interactions which occur between teachers and students in lessons on controversial environmental

issues, has uncovered some possible routes through which the hidden curriculum may be made visible.

However, in suggesting that teachers are likely to express their environmental attitudes in lessons, the intention is not to support the arguments of those who cite environmental education as an indoctrinatory practice. Certainly this study provides little evidence to suggest that students are exceptionally responsive to the underlying messages which permeate the teaching. On the contrary, it seems that the influence of the teacher's views (certainly on students of this age group) may have been somewhat exaggerated, and there are indications that the more that teachers try to impose their own views, the less successful this is likely to be. On a number of occasions, there is evidence that students in this study refused to accept the teachers' version of the topic and they continually, and with some force, resisted their definition of the lesson content. It also appears that, on a number of occasions, students over-estimated the degree of congruence between their own attitudes and those of their teacher (see chapter 6, section 6.4.4). The implications of these findings may be that students avoid having to challenge or re-evaluate their own attitudes because they believe them to be more universally accepted than they actually are. Thus, the outcome of many discussions was that students' positions became more entrenched, rather than being obviously influenced by the teacher's views.

All of the teachers in this study demonstrated a concern about the potential for environmental education to become an indoctrinatory practice. Contrary to the critique, discussed in chapter 2, that teachers are indoctrinating students with ill-thought out attitudes towards the environment, these teachers show clearly articulated rationales for their choice of resources and activities, and a desire to avoid simplistic or biased views at all costs. Nonetheless, this study does demonstrate some limitations to these teachers' conceptualisations of teaching controversial environmental issues. It illustrates the importance of encouraging teachers to reflect on the nature of the information and arguments which they are presenting, rather than falsely believing they are expressing a value-neutral point of view. Both educators and environmentalists would agree that students need to be taught to examine critically the information which they are given and the attitudes or values which have led to its production, and this requires teachers to be acutely aware of the beliefs and attitudes which underlie their own teaching practices.

7.4 Implications of the study for curriculum development and teacher education

This study suggests that the potential for radical environmental education in state schooling in the current climate is slim. If (as seen in this study) the radical environmental agenda of the EE literature is not shared by teachers, its potential to provide a solution to the world's environmental problems will be extremely limited, especially if this solution relies on promoting certain environmental attitudes amongst students. This research also suggests that teachers may not be the extreme environmentalists that some claim (see chapter 2). However, it indicates that the oft-cited ideal of environmental education as a panacea for modern ills may be inappropriate and that new ways should be considered for addressing environmental problems. The limitations to, and constraints upon environmental education in schools, identified by this study, may help to explain the findings of a recent research project which found that students were, ".. very critical of the failure of their schools to fulfil their potential in environmental education" (Connell et al., 1999). This study also has potential implications for other curriculum areas in that it illustrates the risk of ignoring teachers' views in curriculum development. Educational reform, undertaken by means of tinkering with the curriculum, is unlikely to be effective if teachers are not in agreement with its aims.

The thesis has also identified tensions within the philosophy of environmental education: for example, the tension between promoting positive environmental attitudes and encouraging independence of thought, and the thin line between encouraging pro-environmental behaviours and indoctrinating students with green slogans. Similar tensions exist within liberal educational thought, in which imposition of the teacher's views is discouraged, and independence of thought is advocated but alongside the aim of promoting specific liberal values such as tolerance. The aim of this analysis is to make visible the subtle processes by which these tensions may be reflected in classroom practice, in order that other teachers can review their own teaching in the light of this evidence. It is important to emphasise that the analysis is not intended to criticise the skills of the individual teachers observed, but to illustrate the difficulties which beset teachers who attempt to teach about controversial environmental issues in a balanced or value-neutral way.

This study suggests that in difficult curriculum areas such as this, subjective and objective constraints may be at work which prevent teachers from implementing their own beliefs in the reality of the classroom. The nature of schooling, and particularly of

exam-based subjects, is such that teachers are expected to control information, and appear to do so, even in controversial areas of the curriculum by bounding the extent of the discussion, by choosing the resources to be used, and by their use of questioning to control the scope and direction of classroom interactions. Removal of constraints such as a prescribed syllabus and examinations would provide a context in which it might be possible for teachers to work with students in the consideration of some of the deeper issues. Moreover, if teachers were given explicit encouragement to take on a new role as moral guide, they may be enabled to have a more constructive role in helping students make difficult decisions about their own actions. Taking on this role could perhaps enable teachers to maintain their beliefs about not imposing their own values, whilst casting aside the seemingly unworkable concepts of balance and the neutral teacher.

In the light of these findings, a need is identified for teacher education which problematises the concepts of balance and neutrality in controversial issues teaching, and illustrates the ways in which an attempt to maintain balance may result in the indirect expression of the teacher's attitudes. Given that the availability of good, unbiased materials can by no means be ensured, a primary role for teachers should perhaps be to encourage a critical, questioning attitude amongst their students. Stradling et al, conclude that students should be encouraged to critically examine statements made by others and themselves, and that teachers should aim at 'cultivating tentativeness':

> *"Often the result of teaching a topic is not 'clearer ideas' but 'greater confusion'. This has to be tolerated as a stage in moving towards an independent opinion."* (Stradling et al., 1984, p. 116)

The role of 'committed impartiality', described in chapter 2, may provide a more practical guide for teachers than neutrality or balance, enabling them to express their views openly whilst insisting on a critique of all positions including their own. This role enables the teacher to provide an example to the students of commitment to certain values, rather than apathy or extreme relativism, but also encourages students to hold views openly, not dogmatically, and be ready to consider alternatives. Teachers must be able to model for students what is to count as a reasoned point of view, and they cannot do this by subscribing to an ideal of non-intervention. Whichever role teachers decide to assume in the classroom, they should be aware of the possibility that their own environmental attitudes or commitments may be visible to the students, despite their best intentions. They should therefore extend this critical stance to include the teacher's perspective, and take steps to develop a classroom climate where students are able to express such a critique. However, the difficulties of implementing such an

approach given the traditional power relations which divide teachers and students should not be underestimated.

Because of the unforeseen difficulties which arose in discussions in this study, a need is identified for greater teacher training in the planning of classroom discussion, including explicit consideration of the ways in which students may respond, and advice on how the tendency for discussions to become confrontational can be circumscribed. It appears that a more structured discussion strategy is required to prevent deterioration into confrontation and aggression. If serious consideration of attitudes and values is desired, then this needs to be explicitly designed in the plan of the classroom discussion, for example by providing a variety of resources for students to consider with structured questions to be asked of all materials. This may enable more considered responses to be aired rather than the quickfire exchanges which were frequently seen in this study. Extensive attempts should be made to encourage a classroom atmosphere which enables genuine discussion of controversial issues and widespread student participation. Students should feel free to express their own views in a supportive environment where they will be listened to without fear of criticism, and where changing their position is encouraged. Explicit meta-cognitive instructions as to the purpose of these kinds of discussions and the rules of engagement may help students to listen seriously to others and reconsider their views rather than treating the whole event as an elaborate game or contest. Altering the position of desks to encourage face-to-face interaction between students may also encourage participation, reduce aggression, and allow students to discuss issues amongst themselves in a non-confrontational atmosphere.

7.5 Limitations of the study

> *" ... our work need not be beyond criticism to make an important contribution ..."* (King et al., 1994)

The value of this study lies in its role as a research project which investigates, in a contemporary school context, some of the unquestioned assumptions which are rife in much of the environmental education literature. The beliefs and practices of teachers addressing controversial environmental issues are of key importance and interest to a wide range of people and could not have been revealed by a large scale survey. Therefore the study's particular contribution to knowledge has been made possible by the in-depth, intensive study of a small number of teachers. This research provides a rich portrayal of some of the possibilities and problems encountered by these three teachers in their teaching about controversial environmental issues, and raises some

more general issues related to teaching controversial environmental issues. However, as always, the research has also raised a number of questions which have the potential for future investigation, but which could not be dealt with fully in this study. Areas which appear particularly worthy of further consideration include investigation of the influence of subject matter on the teaching approach chosen, and consideration of the impact of teacher-student relationships on classroom interaction.

In addition to further research focusing on teachers, there are potentially interesting research questions to be addressed concerning the ways in which students understand controversial environmental issues. Such research could consider the ways in which students see teaching about controversial environmental issues as differing from teaching about other subject areas, and how this might influence their involvement in lessons. Unfortunately, despite the collection of a large amount of data concerning students' understandings of the environmental issues being studied, much of the student data remains un-analysed. Due to the increasing focus on teaching strategies for controversial environmental issues which emerged over the course of the study, a decision was made not to analyse any of the student data except where it related specifically to the teaching strategy used. However, this is an area which is relatively unexplored in the literature and a study which examined, for example, how students integrate their knowledge of environmental issues from outside school with that gained through learning geography would be of considerable interest. The findings from this study suggest that students are loth to alter their preconceptions and attitudes about environmental issues in the light of school knowledge, but this issue would be worthy of further study.

Any future research building upon the findings of this study could be aided by the knowledge of limitations which, with the benefit of hindsight, can be identified in the study's design. Firstly, there is the question of whether the number of interviews undertaken and the length of time spent observing teaching were sufficient to capture fully the teachers' beliefs and practices regarding teaching controversial environmental issues. Probably the answer to this question is that it would be near-impossible to identify all of the teachers' beliefs and practices: however, a longer period of research may have identified other issues of concern to these teachers. Nonetheless, the claims made on the basis of these findings reflect the length of time available and the fact that they are unlikely to have captured every aspect of teaching controversial environmental issues. They do, however, provide a number of interesting insights into the complexity of teachers' beliefs and practices regarding controversial environmental issues.

A further issue, given the nature of the research, regards the extent to which it can be claimed that the accounts obtained reflect authentic access to the teachers' beliefs. It could be argued that the apparent difficulties which these teachers experienced in trying to enact their beliefs are in fact simply an artefact created by the methodology, whereby access was gained to the teachers' espoused beliefs rather than those beliefs which genuinely guide their action. However, the extended period spent with teachers developing rapport, together with the method of grounding interviews in specific classroom events (guided by the stimulus of the lesson tape), provide attempts to maximise validity, and the confidence with which teachers accounted for their actions in the lessons makes this explanation unlikely. Moreover, the success of the relationships which developed between researcher and research participants gives added confidence in the validity of the data. However, this issue should not be ignored since it provides a potential alternative explanation of the divergence between the beliefs and actions of the teachers.

Furthermore, the development, testing and subsequent modification of analysis procedures was found to be extremely time consuming, and took many months to complete. This was due largely to the exploratory nature of the study: the lack of similar previous research, together with the very limited guidance available on how to analyse unstructured classroom data, meant that there was no obvious template to follow. The decision to analyse only selected extracts from the classroom data was taken in relation to the perceived problems of undertaking a large scale analysis of such data. However, the selection of extracts from the classroom data could be criticised. These extracts were selected on the grounds of their relevance to the issues under study and are not considered to be representative of the lesson as a whole. No claims for *comprehensiveness* are therefore made of this study, even in relation to the three teachers studied. The teaching strategies which are identified here are those which occur when the explicit *controversial* nature of environmental issues is being addressed. Nonetheless, these were by no means uncommon events - in the course of three weeks lesson observation, there was no difficulty in finding sufficient extracts in any of the case studies.

Hammersley (1998) considers claims for validity to depend upon plausibility and credibility, given the impossibility of identifying knowledge that is absolutely certain. Judging research validity therefore involves assessing claims for their likely truth, based on currently well-established knowledge ('plausibility'), and also based on the nature of the research and the researcher ('credibility'). In order to address issues of credibility which might arise in relation to this study (such as those discussed above), attempts have been made, throughout the thesis, to provide sufficient raw data to allow

the reader to assess the validity of claims made, with additional data being supplied in the appendices. In addition, the detailed chapters on methodology and analysis procedures aim to allow the reader to judge the work on the grounds of methodological validity. Nonetheless, the final written account reflects the researcher's interpretation of the data, undoubtedly shaped by the preconceived ideas brought to the study as well as insights from undertaking the research. However, despite the potential problems described above, the dearth of research in this area gives this study validity as an exploratory investigation of the kinds of possibilities and problems which may arise when teaching about controversial environmental issues in geography A level.

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Appendix A1: Data Collection

A1.1 Aims of the Study and Code of Conduct
A1.2 Ethical Issues
A1.3 Example of Lesson Summary
A1.4 Examples of Teacher Interview Schedules
A1.5 Examples of Student Interview Schedules

Appendix A1.1: Aims of the Study and Code of Conduct

What are the aims of the study?

I am doing a qualitative study of geography teachers and sixth form geography students in Oxfordshire with the aim of obtaining their views on teaching and learning about environmental topics in 16-19 geography A level. I aim to produce an account of teachers' classroom decision-making in relation to environmental topics, and to investigate the reasoning behind students' interaction in the classroom. It is hoped that such an account would be of interest to other teachers and help them clarify their thinking about teaching environmental topics.

What will the study involve?

If you agree to participate, I would like to conduct a number of interviews with you and with some of your sixth form students in the next few weeks. I would like to tape record the interviews if possible, purely for my own use. I am interested in how **you** feel about the issues and would like you to feel closely involved in the research. I would also appreciate any constructive comments or criticism you may have about the research design.

After a 2 week lead-in period (involving observation only), I would hope to do a total of 3 interviews with you over a period of 3 weeks (at whatever times are convenient), in which we would talk about specific lessons, concentrating on in-lesson decision making. I would also like to record any brief comments you could provide immediately before and after lessons, relating to planning and review of lesson events (when time permits!), and would like to observe and tape-record these lessons with a radio microphone if possible. I hope to interview 4 students three times during the same period for about 15-20 minutes. I aim to be unobtrusive during lessons and avoid drawing undue attention to my presence.

What will be the end result?

Obviously, one aim is the completion of my thesis around the end of 1998. None of the schools or participants in the research will be mentioned by name. A summary of the findings will also be produced and a copy passed to all participating teachers (if interested). I also hope to publish some aspects of the research in academic journals; again, anonymity will be maintained.

My Code of Conduct

- Involvement in the study is <u>voluntary</u>: all participants have the right to withdraw without reason at any stage of the research, or to refuse to answer any question.
- Extracts, including direct quotations, may be used in reporting the research, but any identifying characteristics of an individual or institution will be removed. (see also 'Ethical issues ...' information.)

If you have any further questions about the research, please feel free to ask me.
Debby Fido, Oxford University Department of Educational Studies, Tel: 01865 274054 or 395785

Appendix 1.2: Ethical issues in research

1) Everybody affected by the research should be able to negotiate with the researcher about the processes of the research, their involvement in it, and the research outcomes.
Initial access to the case study classes will be negotiated via the teacher. An explanation of the aims and reasons for the research will be given (as far as possible), as the teacher's support of the purpose of the study is very important. The requirements of the research will be outlined at the start to enable teachers to make an informed decision as to whether they wish to become involved. Negotiating access to pupils is more difficult due to the problem of approaching them via the teacher and thus being in a position of power. I will try to explain as much as possible to them and to allow them to ask any questions, and also to emphasise that they do not have to be involved in the research, and are free to leave at any stage or to refuse to answer any question. It is the researcher's responsibility to ensure that as much information as possible is made available to teachers and students, but it should also be clear that in a qualitative study, the focus of research may develop and change during the course of a study.

2) The aim of the research is to understand the meaning of events from the point of view of the participants rather than to judge from an external point of view.
Interviews with both teachers and pupils will aim to understand their interpretation of classroom events, rather than impose my own interpretation. As much as possible of the written output will be fed back to the participating teachers for their response. The research should be supportive and benefiting, rather than critical or hindering of the research participants and their actions. The researcher, however, has the right to interpret the results using empirical evidence, and holds the ultimate right to publish without the express permission of participants.

3) The researcher is responsible for ensuring that all participants have confidentiality of their words, both spoken and written, and anonymity of individuals and schools is maintained in any written product.
Access to raw data will be restricted to the researcher and her academic supervisors, and all names of individuals and institutions will be changed in the final product. Teachers should however be aware of the limits of such anonymity in such a small scale study: As in much small scale research, it may be possible for some people with inside knowledge to identify schools or teachers in the study. The need for confidentiality does also mean that the researcher has the right to withhold information provided by other research participants.

4) Participants in the study should be left with a positive view of educational research!
One of the ethical aims of researchers is that "the field should not be left more difficult for subsequent investigators to explore by disenchanting respondents with the whole notion of research participation" (Bell, 1993, Doing Your Research Project). Honesty, and openness about the purposes of the research are very important. Any promises made to participants must be kept.

Appendix 1.3: Lesson Summary

CS2: Tuesday 04-03-97, Wilderness Regions

Teacher (sitting at desk at front)

Vanessa	Louisa		
Lara	Jenni	Dan	
Justine		Jake	Paul
James			

000: 11.20 Chit chat and organisation. Teacher moves video in. Students ask if they're going to watch a video. teacher says maybe. Talking about homework

T: We want to cover as many different examples as possible of tourism and the management of tourism in wilderness regions.

Louisa mentions that she's found another example in the National Geographic and teacher asks her to bring it in.

T: What's happened to tourism in America?

Justine: It's increased

T: Numbers?

Lara: IN 1971 there were 35 million visitors to national parks in America, in 1994 there were 62 million.

048: 11.25 OK .. So we've got this massive rise in tourism. What are the impacts? A bit different from Australia.

P: The increases in numbers are quite a problem because they're not uniform .. in the park there are honeypot sites which have a lot more visitors than other parts. (T: Example?)

Dan: Yellowstone

T: Yeah. Great Smoky Mountains the most. Types of impact? Dan?

Dan: Sort of like what like .. it's disturbing wildlife basically .. humans are. They come into the areas with their cars and drive everywhere and the off roading craze now ..

T: Other activities?

D: Walking rock climbing, sailing, following trails, camping

Justine: Leaving litter behind

T: Effects? Jake?

Jake: You've got overcrowding at viewpoints and attractive places, you've got overcrowding of visitors centres, you've got overfilling of car parks, you've got traffic jams at park entrances, you've got air pollution from car exhausts, overcrowding on popular hiking trails, disturbance to wildlife, increased volume of litter, disturbance to wilderness area, traffic accidents on overcrowded park roads, the spread of soil erosion into back country areas. Parks are spending more and more on traffic management.

T: And an increasing pressure to build bigger visitor's centres, bigger car parks, that kind of thing. Anything else?

Dan: Winter sports have increased .. more skiers, more snowboarders

Justine: Snowmobiles
T: Lara, tell us something about how they've decided to manage it, then?
Lara: Restricted cars and passenger vehicles to a small section of the park, they've encouraged the development of motels restaurants and other facilities such as snowmobile hire outside the park thereby protecting the core. Increased educational programmes to reduce damage by negligence. Restricting visitors to certain parts of the park so there are definite no-go areas. Considering like park full signs and whether you have to book tickets before you go.
Paul: Erm that's about it apart from the thing about VERP (explains this - zoning experiment in park) Visitor experience and resource protection. To see whether the quality of tourist experience was being compromised by the overcrowding .. (explains)

099: 11.30 T: So what is that suggesting the national parks are for - in America - what are the aims?
Dan: To make money .. bigger so more people coming, so visitors centre can get more money
T: So what about park full signs?
Dan: they're trying to conserve the environment as well as make some money out of it
T: Do you think the people who are running these parks are as a business?
Dan: No more about protecting it ... and make some money as well.
Lara: Says at the beginning what their aims are: Important resources of scenery and wildlife and provide areas available for recreation for US citizens
T: Key thing. They are there to provide access. What's aim of VERP
Jake: High quality experience for visitors but they also want to conserve the resource
T: Good, quite new thing really. Specific kind of management .. coffee if they want it toilets etc. What's difference with Australia
Dan: Australia more run by indigenous people! (T pushes him to explain)
T: They have extra element - have to consider indigenous people
Paul: More conservation .. have to be more careful in Australia (explains that they have to look after the indigenous art which needs more careful preservation)
Lara talks about zoning that they did in America.
T points out that decision making in Australian version was more state controlled versus national in US.

147: 11.35 Right, OK. Put the heading Management. (dictates) The world conservation union recognises 8 types of protected area, five of these will be at a national park level (vary in their aims - e.g. more industry allowed in British) and then there's three less stringent protection orders. In addition there are world heritage sites and biosphere reserves.
The 3 key ones which you need to know about are the biosphere reserves, national park and a world heritage site - you should know how these operate. All of them aim to protect environments but possibly for different reasons.
E.g. For the world heritage site .. as well as scenery, they had other significance .. (Dan answers T probes) - may reflect geological processes or evolution. Global significance. National parks

much more for education and recreation as well as protection. Biosphere reserves are aiming for harmonious relations between people and environments. So they are maybe more local community and conservation. OK. and it's the biosphere reserve that has the zoning principle in it. I'll provide further case studies.

196: 11.40 You've already got Australia as Biosphere, you've got the US for a national park, and I'll give you some more stuff on that.
(T hands out another Geofile. Chatting ...) Might have time to watch video. If you turn over Geofile there is a section on tourism in Kenya. I'd like you to describe the nature of tourism in Kenya and the problems it's creating. If you can get that done in 10 minutes then we'll watch the video for 20 minutes, otherwise we'll watch the video next lesson. T asks James to see his notes .. Chatting and some quiet.

261: 11.45 What's savannah vegetation? Shrubs, patchy grass areas, quite arid ...
Oh I know what I forgot to ask you - I'm interrupting here - do you think it's right for the national parks to put up a sign saying full? Put your hands up if you think yes?
(Jake, Lara, Vanessa, Louisa) Justine - no; Paul - depends
T: Justine, you say no
Justine: Well it's basically .. they should be open .. you should be able to go and visit them .. is shouldn't be up to one person to say no, this park's full and you can't come here.
T: So you kind of feel like because it's .. if you're an American citizen because it's in America you have a right to see it (yeah). What if you're from Britain so you have a right to see it? I'm not saying you don't. Yeah, you think you do, why?
Justine: 'Cause it's part of the world and .. (unclear)
T: Yeah, OK, I think that's a good point, Jake?
Jake: No! If a car park's full, it's full, you can't get any more cars in there - even if it's your right, you can't get any more in there so what's the point?
T: We're not talking about putting full on a car park. Really ... is the national park - it' never gonna get so full that you're bumper to bumper and shoulder to shoulder and you simply cannot move, we're talking about putting a sign saying full when it's reached if you like, its carrying capacity, that the impact might be bad .. so go on then .. so why is that OK?
Paul: It'll never get full
Jake: NO, you don't want it bumper to bumper - if it stays open all the time, people are gonna go in and it will get bumper to bumper and the impact to the place would be just horrific. I they want to conserve it and actually let people have the right to see this place, they're gotta er manage it in a way to stop people going in and out.
T: So how do you decide when you're gonna put that full sign up?
Jake: You look at the number of people in the park
T: So how do you know when the number reaches a ...
Jake: You have a look at the .. when certain numbers .. what the impact is on the ground, the amount of litter, various indicators like that, and therefore you can tell how much is the capacity.

T: So you're gonna constantly be researching specific sites to find out ..
Jake: That what happens

309: 11.50 Paul: If it's a national park, then you definitely have a right to go
T: So you, you're disagreeing with Jake?
Paul: OK ..
Jake: I have the right to go into a car park but it's full, does that mean that ..
Paul: Yes, but the most of the national parks have a financial aspect of them -they're all run by private companies ... (like the ones we went to in the field trip) ...
T: So you think, purely because it's owned by someone who's private they can basically choose to do what they want with that land
Paul: Well that's what happens ..
T: No, I'm saying do you think they have the right to ...
Paul: No
Jake: Yes, they own the land. That means that I can do whatever I like in my parents' house
T: But you can't not if you're in a national ...
Jake: ... a private individual will always have right over their land ..
T: Vanessa, go on.
Vanessa: Well it's a simple example but in our area there's a no smoke zone where you can't burn fires in your own home. It's your property but you can't burn fires because it's bad for the .. air.
Jake: The air isn't your property though, it affects other people ...
Vanessa: And if your house is national heritage then you can't make any changes ..
Paul: Yeah, because it's valuable to the whole country
T: Yeah, and isn't that also true of places in national parks? You can be a private land-owner in a national park but you are not free to do whatever you like in that national park. You are not free to put down pesticides and fertilisers, you are not free to actually build certain types .. you have to seek permission don't you? So therefore what you were saying about private landowners being able to do what they want, they can't.
Paul: They can do more than they should be able to
T: Because they're still overseen aren't they - by people?
Paul: But they do more than they should be able to ..
T: So are you saying therefore that if a wilderness region is in part owned by someone who is a private land-owner, they should be allowed to do whatever they like to it, even if it's gonna destroy that area?
Jake: They can have a sign that says full on the thing, is gonna affect the land - it's gonna be damaged by people then you don't want them to come in and damage it.
T: What they're saying here is that the whole park should be inaccessible, or parts of the park - but decided by an overall body - do you think that's OK? .. Do you have rights as a tourist? Do you have a right to see what you wanna see?

Paul: It depends what it is .. I mean museums are stacked full of valuable stuff and you have to pay money to get in to it and they're the bloomin' nation's property ... that's why you should never have important things anything to do with money. You shouldn't even consider having a national park and even think about charging money ..
T: So you think therefore that yes you have a right to see it but you also must have restrictions against that right because it belongs to everybody - to protect it
Louisa: I don't think they should be allowed to charge but I think they should be allowed to restrict entrance because .. (unclear) .. but it's part of people's heritage ..

361: 11.55 T: Some of you seem to be quite cynical about this whole sort of national parks being there to raise money. But if you want .. some of you have actually said that you shouldn't be charging people to use it, therefore how are you gonna implement all your protections, how are you going to have something like VERP ... how can you ensure that if you .. where's your money gonna come from to do that?
Paul: Tax!
Jake: Why don't you just do it by .. people who actually use it have to pay for it
Paul: That is so Thatcherite - we have free schooling, why ...
Jake: But people wouldn't want to pay more tax! If you said OK,. we're gonna put taxes up because we want to do this er national park, everyone's gonna go, 'yeah right mister. No way!' Everyone's gonna go berserk!
Paul: It should be treated the same way as education, you have free education, you have free access to health care - museums should be free, libraries should be free. If you say, alright, no tax, OK - America's not quite no tax. The individual has to buy everything themselves, so you have areas of America that are total crime zones so people build their own little commune things and have guards at the doors ... the people with the money .. but .. (unclear) .. there'd be no crime ..
T: That's true! That's true! It's like Los Angeles
Paul: It's the difference between socialism and Thatcherism .. Depending on whether you believe that everybody should have basic rights and you should tax people so that you try and get more equality or you're talking about Thatcherite power of the individual to get what you can, the best get the best ..
Jake: I'm talking about the practicalities. Do you think people are actually gonna accept having more taxes raised ..
Paul: It's not a major priority though, education's a priority ... (disorder) ... This government we've had for 18 years is junk right? When we finally get a more, we'll have the Labour Party in in a couple of months, right (laughter), that'll gradually change ..
Jake: What a naive thought! What an innocent thought .. that as soon as Labour or the Liberals or the Greens come in it's gonna be any different
Paul: You'll get more and more liberalised

Jake: It's gonna be exactly the same! It's gonna be no different! (lots of objections and shouting ... Paul starts talking about Sweden where the taxes are higher and facilities much better.)
Paul: You shouldn't be so defeatist thinking that Britain is junk, it's gonna stay that way - you could improve it!
T: Can we get back to Wilderness regions?! (laughter) So Paul, how would you feel if somebody did charge you to go to a national park? Would you pay it?
Paul: Well I'd have to .. but I didn't want to .. just 'cause you don't agree ...
Dan: Make donations, I mean National Parks around Britain you can make donations. I mean to walk along the coast you can actually make donations at points just to keep it intact which I think should be in National Parks really. I know some are - as in the Yorkshire Dales where you can make donations in the car parks
Vanessa: I was just gonna say to Jake that the fact that you're saying that putting up taxes is an absolutely ridiculous idea, it's only because you live in Britain and the fact that we do have quite high taxes and we can't see any benefit for it really. And if things were efficient then we wouldn't feel that they were high taxes - if there were good schools and transport and things, then we'd all be prepared to pay taxes for national parks.
Jake: But that's not in reality though is it?
Paul: But it will be a reality!
Jake: It's one of these things that it's now fashionable to be Labour, it's one of these things that .. when you've had a government for a hell of a long time, you always think that the opposition is gonna be much better, and most of the times it's not!
Paul: Well of course it is! We've had poll tax, we've had BSE, the government's junk!

420: 12.00 T: Paul, Paul. I think that is a good point because if you .. I mean I cannot really remember a time when Labour were in power, OK? I mean I was fairly old, I was something like 10 when the government changed. But talking to somebody who was just a few years older and was probably more politically aware than I was at that age, they were saying all they could remember was everybody slating Labour because Labour had been in for so long and saying Labour have done this wrong, we've had loads and loads of strikes under Labour, that kind of thing. And now, in a way, a lot of people are slating the conservatives. And I even feel to a certain extent, I would like Conservatives out, just to see what Labour would do. People do tend to slag off whoever's in power, especially if they've been in power for a very long time.
Paul: Labour haven't been in power this century for a very long time - what were they 1974 - 1979?
T: It's still the end of a term
Paul: But it's the whole policy of the government. When I think government, I look at their policies straight away, I don't think they've been here along time.. I hate the government not because they've been in a long time, but because their policies are junk ..
T: Anyway, let's get away from this Labour versus Conservative thing, Louisa, what were you gonna say?

Jake: I'm not Conservative, please! But I'm not Labour either.
Louisa: It's because we live in a climate where .. tax is seen as negative whereas paying out for something you want to do is not see as negative, it's seen as something you have to do. But it's just like the perception of the people - If they felt that paying taxes was right and that it was something you had to do .. it wasn't seen as negative, than paying for .. (unclear)
T: Yeah, I know what you mean. What about the way taxes are done?
(Tape ends. Turn over, rewind and reset counter.)

062: (re-starts) Paul: I think they should abolish VAT
T: I mean percentage. Do you think the percentage of tax should be the same for everybody.
Louisa: No, it should increase ..
T: But the what problems have you got? Disincentive, or incentive to invest in tax free things.
Louisa: That's because there is huge .. steps between the tax bands and if you reduced the steps then it would be a much fairer system and erm .. it would mean that people who are richer are paying more, whereas at the moment, if you're quite rich you pay as much as if you're really really rich, which is really unfair
Vanessa: Basically I mean we have a society where tax evasion is quite .. I mean people can tax evade and basically a lot of people are doing that. I mean they have lots of money ...
T: And it's not seen as the same as theft
Vanessa: Yeah well precisely, I mean you're only taxed if you live for 6 months in this country, so what a lot of people do is they live abroad and then come back and they send their children to private schools and .. because they live long enough in the country to get free health care and stuff, they abuse that and then they live a totally wealthy life and don't have to pay tax - and so leaving the rest of the country having to fork out all the more money because of those people who are sponging off the state.
Louisa: And that's what sponging off the state is, not these people who are .. claiming 50 quid a week ..
T: And that's not what's usually talked about is it?
Jake: But you've got it on both levels - you've got the people at the bottom who can't be bothered to do work and go on the dole and you've got the people at the top who are earning so much ...
(Lots of objections along the lines that people don't prefer a life on the dole to being rich, and also that if they get a job and it pays them no more then why should they and they should have a minimum wage so that that wasn't the option. Jake argues that there's a huge load that just can't be bothered to get a job. Louisa argues that there aren't any jobs and that the government are taxing the lowest paid. Mayhem, shouting. Louisa talks about housing benefit loss - people can't survive without it. T says that some people choose to opt out of the system. Paul argues that it's not a big thing. T says she knows people like that. Paul argues that people are trapped in benefits because they can't get a job that pays anything.)

098: 12.05 T closes subject and tries to bring back wilderness regions. 10 minutes to work on this. (They all say they've finished, and did it while others were chatting)

Lara: .. about irrelevancies which have all been recorded on tape.

T: It's not irrelevant! Is it irrelevant Lara?

Lara: Well what's it got to do with tourism in Kenya?

T: Right, OK, lets' think about it. What has it got to do with .. it's not irrelevant .. how can you see that these ideas could be used say in essays and things like that?

Jake: To do with how you fund these .. operations and conservation and ..

T: And sometimes they will ask you - what are the political factors influencing management. And really you can talk about different levels of environmental thinking - people having different ideas about the environment. But ultimately it does come back to these things like funding and who is in power and policy making and tax and stuff like that. So it kind of seems irrelevant but it's not really if you think about management.

Paul: It's about your life as well .. The government affects you, how much money you've got, whether you're gonna get good jobs .. whether you're gonna have good health care, good schools.

T: And that's something you've got to think about when you talk about paying for national parks, you're already saying that some people are never gonna go there.

A bit of arguing continues and Paul says "I can't believe how right wing people are - I'm shocked!"

116: 12.10 Lara starts talking about peep shows in Thailand.

T: If you haven't finished this make sure it's finished by Thursday and we'll watch the video on Thursday. Students pack up and leave.

Summary of lesson 04-03-97: Wilderness Regions

Subject Matter	Teacher activities	Student activities	Resources	Grouping arrangements
Impacts of increased tourism in wilderness regions, and ways of management.	Framing (setting boundaries of topic), questioning, probing, re-formulating student answers, evaluating, informing.	Answering teacher's questions.	None	Whole class talking in turn to teacher (bidding or teacher selection).
Management of protected areas.	Dictating notes, questioning, probing, re-formulating student answers, evaluating, informing.	Answering teacher's questions. Making notes.	None	Whole class talking in turn to teacher (bidding or teacher selection).
Nature and problems of tourism in Kenya	Framing, providing information.	Reading, making notes.	Geofile	Working individually.
Should access to national parks be restricted? (Extract about 'Park full') Talk moves onto politics of independent choice vs state control and of Conservative vs Labour etc.	Questioning, asking students to vote, eliciting explanations, probing, re-formulating student answers, informing.	Voting, explaining votes, answering teacher's questions.. Discussing with teacher and with each other.	None.	Whole class talking in turn to teacher and to each other. Question and answer becomes class discussion.

Appendix 1.4 Examples of teacher interview schedules

1.4.1 Case Study 1. Teacher interview 1

1. I remember you saying to me before this lesson that you weren't sure whether it would work - that you'd tried it with another class and they didn't seem to get it - but you thought this class was higher ability. **Do you think you could just explain a bit more what you were referring to here?**

Probe - what was your plan for the lesson? (intention)

Probe - how successful do you think the lesson was in relation to that plan?

2. The lesson was based around a passage from the Prosser book (looking at indigenous agriculture in PNG) - **I wonder if you could tell me why you chose that particular passage?**

Probe - What did it illustrate particularly?

Probe - How did you come to the key points you wrote on the board? What was the purpose of them? (show copy of key points)

3. Play passage on side 2 of tape **169 onwards** - 'the Maring forest' (Sarah) - ask her to stop whenever or you stop tape.

Can you tell me a bit about what was going on here?

Probe - Why did you pick up on this particularly?

Probe - In what way does this reflect your own beliefs or values?

4. (If not already mentioned, continue tape to 'survival of the fittest' (Alex) approx. **178 onwards** - ask, **What did you think of this comment? What were you thinking here?**

5. (IF time allows) Forward to bit about pigs, **272 onwards** (this was one of the bits you commented on, I think, after the class) and ask - **What do you think was going on with the class here? What were your personal feelings about that?**

Return to key understandings if possible.

1.4.2 Case Study 2. Teacher interview 1

1. OK, I'd like to start by talking quite generally about the topic of Wilderness Regions. Could you just start by saying a bit about why you chose to do this module?

Why did you think it was important or interesting? *(Try to probe about values, beliefs)*

What are the main things that you would like the students to have achieved by the end of the module? (Knowledge, skills, attitudes)

2. And about the recent lessons on Antarctica - how did you decide on this as a case study?

What kinds of issues do you think it illustrates?

The lessons were based quite a bit around the video about Antarctica. Can you tell me why you chose to use this as a resource? (What did it illustrate particularly?)

2a. You were talking after the lesson about how well it tied in with Chaffey and the other resources - can you say a bit more about this?

3. What about the teaching strategies that you used - can you tell me why you chose those particularly? (role play, discussions, use of bubble diagrams)

Did the lessons go as planned?

Was there anything that you thought went particularly well?

Was there anything that came up that you thought was particularly interesting?

4a. You seemed to be quite pleased with the amount of discussion in Tuesday's class - is that important to you for the students to be able to discuss things? Do you feel that there are any constraints on having class discussions? (explain)

5. I'll just play a bit of the role play - this came out quite well actually ... Side 2 tape 003, **082 - 096 What did you think of the sort of discussions that were going on?**

What do you think particularly they learn from doing role play?

5b. You also said that "Role play's something I do a lot with this group because I know they're good at it." - could you say a bit more about what you meant by this?

6. Play passage on side 1 of tape 001 **392 - 415** - 'nuclear testing' - ask her to stop or you stop tape. **What was going on here?**

Can you tell me what were you thinking or feeling here?

1.4.3 Case Study 3. Teacher interview 2

First of all I'd like to talk about this week's lessons - and then I'd like to ask a few more general questions if that's OK.

1. I want to start with this morning since that's clearest in our minds at the moment - first of all can you just tell me what your main aims were for the lesson?

Were there particular skills that you were trying to develop? And attitudes/ values?

How well did you think the students got on with it?

Is a role play something that you often use?

What are its advantages/ disadvantages? - compared say to discussion of own views?

2. How would you describe your role in the role play? What was your aim when you did get involved?

2a) Play side 2 (416 onwards) - "as an onlooker" .. **- Can you tell me what your aim was here? Why did you feel that it was necessary to make this point?**

How would you describe the kinds of questions which you were asking?

How did you feel about the response?

I noticed you let it go a long time before you said anything at all - why was that?

2b. Play start of side 1 of tape (000) - kept arguing from role - need for exams**. Can you tell me a bit more about the point you were making here?**

You've talked quite a bit about the importance of looking at different viewpoints and understanding conflict and controversy (in the lessons and also in the last interview) - is this a philosophical stance or so that the students can answer the exam questions?

Do you think it's important in the wider society?

3. OK, let's just quickly look at an extract from Monday's lesson - extract 5 - **and again, if possible, I'd like you to talk me through the point you were making.**

What do you think should be done to resolve this conflict?

Do you think that development or conservation should take priority?

What were you aiming at with the questions here?

Why do you think it's important that the students should understand about poss. conflicts?

I'd like to move on to some more general questions now, a little different to what we've done before - more to do with your thoughts on geography teaching.

4. ABOUT TEACHING: What do you see as your primary purpose as a teacher - how do you see your role?

Are there any other subsidiary aims in your teaching?

What kinds of people or events do you think have influenced the way you teach? (How has background influenced it? Explore biographical details - CCF, non-PGCE, his own teachers?)

What do you think makes a good geography teacher?

5. GEOGRAPHY 16-19: Let's now think specifically about the 16-19 A-level course - what would you describe as its main characteristics?

Probe: What sort of teaching methods does it seem to expect? How do you feel about any of these?

(if don't mention enquiry approach ask what they think of it)

What about the values dimension? (if don't mention)

6. THE ENVIRONMENT How would you describe your own position on environmental issues? (Concerned, very concerned, not concerned etc. Show O'Riordan summaries)

Would you describe yourself as an environmentalist?

Do you think your views are realistic or idealistic? Has this changed?

What do you think has influenced your thinking about environmental issues?

7. ATTITUDES AND VALUES: I'm particularly interested in attitudes and values - what do you consider to be the significance of attitudes and values in geography teaching?

(Show sheet on teacher's role in CIs): If you were to place your approach into one of these categories, which would it be? Why do you use that approach?)

(Show ATTITUDE QUOTES): What do you feel about these two statements?

Do you have aims for the development of students' attitudes?

Do you think teachers **should/can** try and change students' attitudes?

Would you tell students what your views are? Do you think they know?

Are there any topics about which you would feel differently - or any occasions?

Do students often express their own viewpoints? How do you feel about students expressing their own views? And you? (e.g. re-visit TW comment - was this your own opinion?)

If students did become more environmentally concerned as a result of taking this course, would you consider that to be a good thing? In what ways?

Have you experienced any particular advantages or problems with teaching about attitudes and values in geography A level? How do you cope with students who express attitudes which you disagree with? Is that an issue?

And finally - what would you think that the influence of having me in the lesson has been? And the microphone? Could you guess from the last interview where my interests lie?

THE ENVIRONMENT

1. Scientists can find solutions to all environmental problems
2. To solve environmental problems, we must reduce inequalities in wealth
3. More regulation and government action would solve environmental problems
4. Environmental problems will only be solved when people start thinking of other species as equals

Teaching controversial issues

1. Balance:

"... the teacher should offer students a range of alternative viewpoints on each issue."

2. Neutrality

"... the teacher's role is that of an impartial chairman of discussion groups, ensuring that all students can have their say ..."

3. Commitment

"(the teacher's role is to) state his or her own commitments and allegiances in the classroom ... there are some issues on which you cannot be impartial."

TEACHERS SHOULD BE ...

"... promoting positive attitudes towards the environment by encouraging: appreciation and concern for the environment; independence of thought; respect for others' beliefs ..."

COURSES SHOULD ...

"... enable candidates to acquire ... an attitude of concern for the quality of environments, for the condition of human life and for the biosphere as a life support system."

Appendix 1.5 Examples of student interview schedules

1.5.1 Case Study 1. Student interview 1

1. First of all, I'd like to talk about the lesson on Thursday. It was about shifting cultivation, and whether indigenous people have an impact on the rainforest or not - yeah? Could you just tell me what you remember about that lesson - in your own words, what was going on in that lesson?

Was there any bit of the lesson you found particularly interesting?

(Content or Activity)

2. What about the big discussions which were going on - what did you think was going on there? What are your own opinions? (Show extract)

Were there any points of view stated in class that you disagreed with?

Were there any points of view stated in class that you agreed with?

Probe about individual contributions:

Alex - survival of the fittest - part of nature - It's my opinion, freedom of thought ...

- Could you explain a bit more about what you were saying? Why? Was that really how you felt?

- How did you feel about the teacher's response? What was the result?

Josie - seemed to know a lot about it - logging in Amazon - doing reading? - From PNG - does she have a special interest? Mentioned that she knows someone who works there - why?

Sarah - It doesn't belong to them, they just live there

- What did you mean? How did you feel about the teacher's response? What was the result?

3. Did you talk about how you felt in the lesson? Would you like to have said more?

If they didn't, why not? If they'd like to say more, why don't they?

Do you usually feel able to talk about how you feel in class?

4. What do you think was the point of the lesson - what do you think the teacher was trying to achieve?

What effect did that have on you? (Did it work?)

Did you think that the views put forward in the book were the same as what Mrs. **** was trying to say - or were there any differences?

Do you believe that indigenous groups live in harmony with the environment or that they cause some damage?

5. Did you change your views at all during the lesson?

What did you think initially ? Why? And at the end of the lesson? And now? Why?

If you changed your view, why do you think that was?

6. When the teacher said (show end of extract) - what did you think?

1.5.2 Case Study 2. Student interview 3

1. Right first of all if we start like the other interviews with the lessons this week about tourism in wilderness regions - could you just tell me what you remember about the lessons - in your own words, what was going on in the lessons?

What do you think you learnt? Did you enjoy them?

Were there any parts you found particularly interesting? (Content or Activity)

Was there anything that surprised you?

What do you think the teacher's aim was for the lessons?

2. What do you think are the main impacts of tourism in wilderness regions?

How serious do you think these impacts are?

What do you think should be done to reduce the adverse impacts?

3. I've just got one extract to look at this week (about putting up 'park full' signs) - maybe I'd better start with Jake as he was most involved in this discussion - what was going on here, Jake?

What do the others think about this - should parks be closed when full?

Should visitors have to pay? How should they be funded?

Why didn't they say more? Would you have liked to say more?

Did any of you change your views at all during the lesson? If so, how and why?

What do you think the teacher's views were about this?

OK, I've got some more general questions now - for discussion:

ABOUT LEARNING GEOGRAPHY

4. What do you think as geography teacher should be trying to do when they're teaching? What kinds of things make a really good geography teacher? What should they do?

Being interesting? Being knowledgeable?

Being relaxed? Keeping order?

Keeping you on-task? Allowing diversions?

Listening to students' points of view?

Do you think teachers should tell you **their views?**

Do you think Miss. **** brings her opinions into class? In what ways?

What do you think her views are on environmental issues/ wilderness regions?

ABOUT ATTITUDES AND VALUES

4. Some people have said that teaching about the environment in school should lead them to developing more positive views on environmental issues. (SHOW ATTITUDE QUOTES) What do any of you think about that?

Do you think that teachers **try** and change your views?

Do you think teachers **can** change your views?

Does it depend on the teacher? Explain.

Have your views on wilderness regions changed through studying them? Why/ why not?

Do you think you're able to talk about your own opinions enough?

Would you like to say more? If you don't say much, why don't you?

What are the advantages and disadvantages of discussing people's opinions?

ABOUT THE ENVIRONMENT

6. How would you describe your own position in relation to environmental issues in general? (if difficult probe with ideologies)

Would you describe yourself as an environmentalist?

Do you think your views are realistic or idealistic?

What do you think have been the main influences on your thinking about environmental issues?

Can you think of anything which might change your view of an environmental issue?

??Is there anything you can do about environmental problems? Do you do it?

1.5.3 Case Study 3. Student interview 1

1a). Firstly, thinking about the recent lessons on the Lake District and the Cevennes - could you just tell me anything that you remember about the lessons - in your own words, what was going on in the lessons? (Remember it's not a test!)

What do you think are the main issues that the teacher has been trying to get across?

Did you enjoy the lessons?

Were there any parts you found particularly interesting? (Content / Activity)

1b) What about the role play in the lesson yesterday - how did you find that?

Did you agree with the viewpoint of the role that you had been given? What was own view?

How difficult was it to argue? Would you have liked to express your own view?

Why do you think the teacher might have done the RP? What do you think was his aim?

1c) What did you think about the teacher's role in it - should he have got more involved - chairing it for example? When he did get involved, what do you think his aim was? Why do you think he might have come in here?

How do you feel about this? Do you think it was good that he got involved - or bad?

2. I've got an extract from an earlier lesson here that I'd like you to have a look at - Show extract 3: ramblers - **In this part of the lesson, there was a lot of discussion about conflicting viewpoints - can you tell me how you felt about this?**

Did you sympathise with any of those positions? (ramblers/ landowners/ locals etc.)

What are your **own** views on this issue?

Would you have liked to talk more about how **you** felt? Do you in other lessons?

Did you change your views during the lessons? If so, why do you think that was?

What do you think the teacher's views were about this? (probe about question - who would take a contrary viewpoint?) Do you think that teachers should tell you their views?

Why do you think that it is important to look at different viewpoints?

3. OK, one more extract to have a quick look at - show extract 2 (shortened), on deforestation - **what do you think the point was that the teacher was trying to make?**

What do you think is his view of deforestation? Do you agree with him?

Who do you think is responsible for deforestation? What could be done?

OK, I've got a few more general questions now:

4. **ABOUT LEARNING GEOGRAPHY (OPTIONAL) What kinds of things make a really good geography teacher? What should they do?**

Listening to students' points of view?

Do you think teachers should tell you **their opinions/ views?**

Do you think Mr **** brings his opinions into class? In what ways?

What do you think his views are on environmental issues?

5. ATTITUDES AND VALUES Some people have said that teaching about the environment in school should lead students to develop more positive views on environmental issues. (SHOW ATT. QUOTES) What do you think about that?

Do you think that teachers **try** and change your views?

Do you think teachers **can** change your views?

Does it depend on the teacher? Explain.

Have your views on national parks changed through studying them? Why/ why not?

Do you think you're able to talk about your own opinions enough?

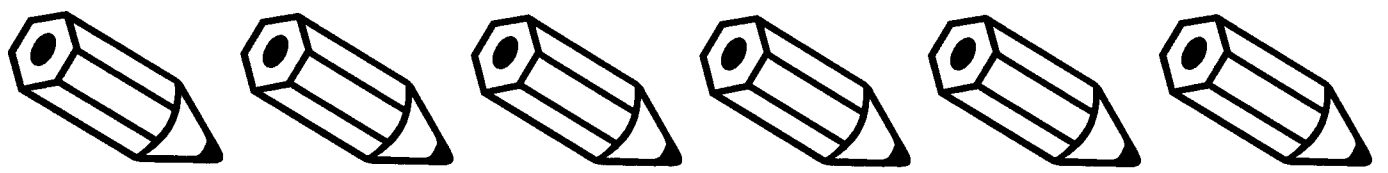
Would you like to say more? If you don't say much, why don't you?

6. ABOUT THE ENVIRONMENT How would you describe your own position in relation to environmental issues in general? (Concerned - not concerned etc.)

Would you describe yourself as an environmentalist?

Do you think your views are realistic or idealistic?

What do you think has influenced your thinking about environmental issues?

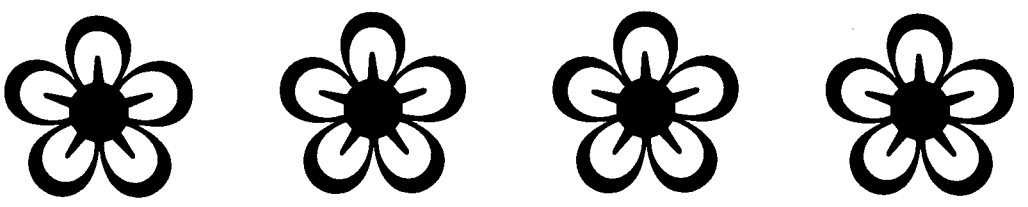


TEACHERS SHOULD BE ...

"... promoting positive attitudes towards the environment by encouraging: appreciation and concern for the environment; independence of thought; respect for others' beliefs ..."

COURSES SHOULD ...

"... enable candidates to acquire ... an attitude of concern for the quality of environments, for the condition of human life and for the biosphere as a life support system."



THE ENVIRONMENT

1. Scientists can find solutions to all environmental problems

2. To solve environmental problems, we must reduce inequalities in wealth

3. More regulation and government action would solve environmental problems

4. Environmental problems will only be solved when people start thinking of other species as equals

Appendix A2:
Data Analysis

A2.1 Initial themes and alterations
A2.2 Initial propositions (case study 1)
A2.3 Provisional propositions (case study 1)
A2.4 Table of supporting evidence
A2.5 Percentage of data utilised
A2.6 Table of key concepts
A2.7 Teaching Strategies

Appendix 2.1
Initial themes and alterations made to themes

The themes originally selected from the literature reflected what were considered to be the key foci of the study, and those areas likely to be helpful in answering the research questions. These themes were also a reflection of the kinds of questions which had been asked in the teacher interviews. Initial themes are listed below, together with a definition of each one, the rationale for its inclusion, and the changes made to it in the early stages of data sorting:

- **Theme: Environment/ Environmentalism**

  Definition
  This theme refers to the teachers' general views on the environment and/ or environmentalism.

  Rationale
  The teachers' own views on the environment are likely to influence how they teach environmental topics.

  Changes made to theme
  This theme was re-named 'teachers' environmental attitudes' since this name seemed to more accurately convey the meaning of the data bits included.

- **Theme: Teaching geography**

  Definition
  This theme refers to the teachers' beliefs about teaching geography. It incorporates the teachers' views of the importance of teaching geography, their general aims when teaching geography and their perception of good geography teaching.

  Rationale:
  The teachers' general views about teaching geography were thought to provide an important context into which to place their views on the teaching of controversial environmental issues.

  Changes made to theme
  None

Theme: 16-19 A level

Definition

This theme includes any explicit reference made by the teachers to the 16-19 A level syllabus or to the exams. This theme might include their perception of what this syllabus involves (particularly the enquiry approach and any references to attitudes and values relating to the syllabus), and its advantages and disadvantages.

Rationale

The syllabus context is likely to have a very strong influence on the teachers' practices. This syllabus was selected by the researcher for study because of its emphasis on both attitudes and values, and environmental issues.

Changes made to theme

The 'enquiry approach' was selected as a separate theme, due to the high number of references to this aspect of the 16-19 course.

Theme: Students' environmental attitudes

Definition

This theme refers to any reference made to environmental attitudes or to the controversial nature of the subject matter. It includes any aims the teachers have for their students' environmental attitudes.

Rationale

The main focus of the study grew from the literature which suggested that teaching environmental issues should influence students' environmental attitudes, therefore this was a key focus of the research.

Changes made to theme

This theme was sub-divided into 'teacher's view of students' environmental attitudes' and 'teachers aims for students' environmental attitudes', since the initial theme included too large a quantity of data to be helpful as a sorting device.

Theme: Independence of thought

Definition

This theme includes any reference made to the students' independence of thought regarding controversial environmental issues, for example, the need for them make their own decisions about the issues.

Rationale

Independence of thought is another aspect emphasised by the literature used as the starting point for the study, and was considered to be of potential importance in influencing teaching about controversial environmental issues.

Changes made to theme

This theme was discarded as it was deemed unhelpful in sorting the data, and overlapped with another theme. The data bits which did fit into this category were either felt to be encompassed by the category, 'teacher's aims for students environmental attitudes', or had been produced in response to the prompts used in the final interview (see appendix A1.4). This data was therefore included as a separate theme, entitled 'NCC and syllabus statements' because the teachers' responses referred largely to the statements themselves, rather than being directly about their own teaching practice, although this was sometimes mentioned.

Theme: Teaching strategies for controversial environmental issues

Definition

This theme refers to the teachers' beliefs about appropriate teaching strategies for teaching about controversial environmental topics. It includes their beliefs about the role which they should take on, the kind of resources they should use, and the kinds of classroom activities which they should undertake.

Rationale

A crucial aspect of the teachers' beliefs about teaching controversial environmental issues will relate to their choice of teaching strategies and the rationale for this choice. This was considered to be a key aspect of the research.

Changes made to theme

None

Appendix 2.2
Case Study 1: Initial propositions

- **Theme: Teaching geography**

1. Successful A level geography teaching, for this teacher, involves the twin aims of examination success and production of students who are interested in, and knowledgeable about, geography.
(T1 420-3; T3 194-202)

2. This teacher feels that her perspective as a scientific geographer means that she approaches the syllabus in a different way from other teachers, putting particular emphasis on rigorous, unbiased description and critical analysis, based on sound evidence.
(T1 334-9; 369-72; 170-2)

3. This teacher believes that geography teaching should be interdisciplinary, and cover basic principles and facts about regions, in order to provide a sound basis for addressing issues of current concern.
(T1 318-20; T3 76-8; 80-85; 87-92; 97-9; 101-8; 109-110; 125-7; 157-60)

- **Theme: 16-19 A level**

4. This teacher believes that the 16-19 syllabus offers more opportunities for looking at attitudes and values than a traditional A level syllabus.
(T3 411-6)

5. This teacher believes that it is important for students' attitudes about issues to be based on sound geographical knowledge, and feels that this is an area which was initially weak in 16-19 but has improved with changes in the syllabus.
(T1 359-60; 376-85; T3 354-9; 365-7; 370-1;379-90; 411-6)

- **Theme: Enquiry approach**

6. This teacher believes that an informed and structured enquiry approach is very valuable in terms of student development, but perceives constraints relating to the ability level of some students and their expectations about the traditional teacher role.
(T1 232-3; 237-41; 243-5; 402-12; T2 178-87; T3 8-15; 208-17; 278-80; 400-3)

- **Theme: Teacher's environmental attitudes**

7. This teacher believes that environmental problems are not as serious as is often suggested, and are likely to be solved by a mixture of individual and government action.
(T3 493-508; 537-44; 617-26; 626-42; 642-55; 656-79

8. This teacher views environmentalism as the domain of people in developed countries, who are often proselytising, biased and detached from reality, and she is keen not to reflect this image in her teaching practice.
(T2: 52-3; 307-9; 354-6; 383-5; 387-8)

- **Theme: Teacher's view of students' environmental attitudes**

9. This teacher feels that students' attitudes towards environmental and development issues tend to be simplistic, coloured by their social background, and often based on ignorance, resulting in a lack of empathy for third world countries and peoples.
(T1 91-3; 98-101; 112-5; 118-122; 254-72; 280-5; 299-310; 323-8; 339-42; T2 28-32; 65-7; 328-338; 398-403; 428-30; T3 230-2; 608-11)

- **Theme: Teacher's aims for students' environmental attitudes**

10. In her teaching, this teacher aims to challenge students' simplistic attitudes towards environmental and development issues, to break down stereotypes, and to encourage students to empathise with other people and cultures, but she feels that this is difficult to achieve.
(T1 46-9; 86-8; 95-7; 133-5; 142-5; 154-9; 180-2; 278-80; 287-9; 313-8; T2 392-6; 405-15; 421-7; 441-6; T3 558-62; 588-90)

11. This teacher believes that students should be encouraged to provide evidence to support their own attitudes, and take a critical view of the evidence and attitudes in text books and the media, in order that they are able to make informed decisions about issues.
(T1 361-9; 390-5; 344-50; T3 181-4; 186-90)

12. This teacher wants to encourage the students to feel that they can do something about environmental issues but not to become too polarised in their attitudes, and to be realistic about what can be achieved in order to avoid becoming demoralised.
(T2 43-9; 316-320; 339-41; 506-510)

- **Theme: Teaching strategies for controversial environmental issues**

13. This teacher sees her role in teaching about controversial environmental issues as providing balance, encouraging students to state their views, and enabling them to make their own decisions, rather then imposing her own attitudes on the students, since they can be easily influenced.
(T2 122-8; 299-301; 301-10; 320-5; 352-9; T3 238-45; 532-40)

14. This teacher chooses teaching materials for lessons about controversial environmental issues which address the issues in a way that challenges stereotypes and commonly-held views, with the aim of encouraging students to think about their own views.
(T1 24-5; 28-9; 36-44; 209-212; T3 293-302; 305-12)

15. This teacher felt that it was important that the students had a factual basis on which to discuss their attitudes towards controversial environmental issues.
(T3 222-6)

- **Theme: NCC and Syllabus statements**

16. This teacher felt that the two statements expressed the polarised views of environmentalists, were unrealistic and could be disempowering to students who might feel depressed about the scale of environmental problems, rather than feeling empowered to take action.
(T3 438-71; 489-522)

17. This teacher saw the two parts of the NCC statement as incompatible, and valued independence of thought and realistic understanding over promoting positive attitudes.
(T3 476-88; 526-31)

Appendix 2.3
Case Study 1: Provisional propositions

- What are the case study teachers' beliefs and aims regarding teaching controversial environmental issues in Schools' Council 16-19 A level geography?

- **Group 1: Teaching A level geography**

1. Successful A level geography teaching, for this teacher, involves the twin aims of examination success and the production of students who are interested in, and knowledgeable about, geography.
(T1 420-3; T3 194-202)

4. This teacher believes that the 16-19 syllabus offers more opportunities for looking at attitudes and values than a traditional A level syllabus.
(T3 411-6)

- **Group 2: Using the enquiry approach**

6. This teacher feels that an informed and structured enquiry approach is very valuable in terms of student development, but she perceives constraints relating to the ability level of some students and their expectations about the traditional teacher role.
(T1 232-3; 237-41; 243-5; 402-12; T2 178-87; T3 8-15; 208-17; 278-80; 400-3)

- **Group 3: Taking a critical view**

2. This teacher feels that her perspective as a scientific geographer means that she approaches the syllabus in a different way from other teachers, putting particular emphasis on rigorous, unbiased description, and critical analysis based on sound evidence.
(T1 334-9; 369-72; 170-2)

11. This teacher believes that students should be encouraged to take a critical view of the evidence and attitudes in text books and the media, in order that they are able to make informed decisions about issues.
(T1 361-9; 390-5; 344-50; T3 181-4; 186-90)

- **Group 4: Basing attitudes on evidence**

5. This teacher believes that geography teaching should be interdisciplinary, and cover basic principles and facts about regions, in order that students' discussions about their attitudes towards controversial environmental issues can be based on evidence and geographical knowledge, an area which she feels was initially weak in 16-19 but has improved with changes in the syllabus.
(T1 359-60; 376-85; T3 354-9; 365-7; 370-1;379-90; 411-6)
Incorporates prop. 3 - (T1 318-20; T3 76-8; 80-85; 87-92; 97-9; 101-8; 109-110; 125-7; 157-60)
Incorporates prop. 15 - (T3 222-6)

- **Group 5: Challenging simplistic attitudes**

10. In her teaching, this teacher aims to challenge students' ignorant, simplistic attitudes towards environmental and development issues, to break down stereotypes, and to encourage students to empathise with other people and cultures, but she feels that this is difficult to achieve due to the students' social backgrounds.
(T1 46-9; 86-8; 95-7; 133-5; 142-5; 154-9; 180-2; 278-80; 287-9; 313-8; T2 392-6; 405-15; 421-7; 441-6; T3 558-62; 588-90)
(incorporates prop. 9: (T1 91-3; 98-101; 112-5; 118-122; 254-72; 280-5; 299-310; 323-8; 339-42; T2 28-32; 65-7; 328-338; 398-403; 428-30; T3 230-2; 608-11)

14. The teaching resources this teacher selects for lessons about controversial environmental issues address the issues in a way that challenges stereotypes and commonly-held views, the aim being to encourage students to think about their own views.
(T1 24-5; 28-9; 36-44; 209-212; T3 293-302; 305-12)

- **Group 6: Encouraging realism and optimism**

7. Environmental problems, according to this teacher, are not as serious as is often suggested, and are likely to be solved by a mixture of individual and government action.
(T3 493-508; 537-44; 617-26; 626-42; 642-55; 656-79

16. This teacher feels that promoting the polarised, unrealistic views of western environmentalists could be disempowering, and instead aims to encourage the students to have realistic attitudes, and optimism regarding taking action on environmental problems.
(T3 438-71; 489-522)
(includes prop. 8: (T2: 52-3; 307-9; 354-6; 383-5; 387-8)
Includes prop. 12: (T2 43-9; 316-320; 339-41; 506-510)

- **Group 7: Providing balance & encouraging independence**

13. This teacher sees her role in teaching about controversial environmental issues as providing balance, encouraging students to state their views, and enabling them to make their own decisions, rather then imposing or promoting her own attitudes, since the students could be easily influenced.
(T2 122-8; 299-301; 301-10; 320-5; 352-9; T3 238-45; 532-40)
Incorporates prop. 17: (T3 476-88; 526-31)

Appendix 2.4:
Evidence for and against final propositions (Case Study 1)

• Group 1: Teaching A level geography

1. Successful A level geography teaching, for this teacher, involves the twin aims of examination success and the production of independent students who are interested in, and knowledgeable about, geography.

4. This teacher believes that the 16-19 syllabus offers more opportunities for looking at attitudes and values than a traditional A level syllabus.

Proposition:	Interview 1 evidence	Interview 2 evidence	Interview 3 evidence
1.	420-27	185-190; 205-9; 215-224	194-8; 254-269; 274-8; 313-6; 331-33
4.			411-6; 421-6

• Group 2: Using the enquiry approach

6. This teacher feels that an informed and structured enquiry approach is very valuable for the students in terms of increasing self-confidence and developing research skills, but she perceives potential constraints relating to the ability level of some students and their expectations about the traditional teacher role.

Proposition:	Interview 1 evidence	Interview 2 evidence	Interview 3 evidence
6.	72-80; 232-3; 237-42; 243-5; 247-50; 402-15	131-2; 178-87; 200-202; 240-7	8-26; 28-33; 35-41; 45-54; 200-204; 208-218; 278-80; 387-90; 392-403; 407-9

• Group 3: Taking a critical view

2. This teacher feels that her perspective as a scientific geographer means that she approaches the syllabus in a different way from other teachers, putting particular emphasis on rigorous, unbiased description of geographical processes, based on sound evidence.

11. This teacher believes that students should be encouraged to take a critical view of the evidence and attitudes in text books and the media, in order that they are able to make informed decisions about issues.

Proposition:	Interview 1 evidence	Interview 2 evidence	Interview 3 evidence
2.	334-9; 369-373; 375-87	77-80	
11.		344-50	169-72; 181-84; 186-90; 295-99

- **Group 4: Basing attitudes on evidence**

5. This teacher believes that geography teaching should be interdisciplinary, and cover basic principles and facts about regions, in order that students' discussions and attitudes towards issues of current concern can be based on evidence and geographical knowledge, an area which she feels was initially weak in 16-19 but has improved with changes in the syllabus.

Proposition:	Interview 1 evidence	Interview 2 evidence	Interview 3 evidence
5.	318-22; 359-69; 378-87; 390-5;	74-9	76-8; 80-5; 87-99; 101-11; 124-7; 146-7; 157-60; 222-7; 354-9; 362-7; 370-74; 379-81; 387-90; 417-21; 608-11.

- **Group 5: Challenging simplistic attitudes**

10. In her teaching, this teacher aims to challenge students' ignorant, simplistic attitudes towards environmental and development issues, to break down stereotypes, and to encourage students to empathise with other people and cultures, but she feels that this is difficult to achieve due to the students' social backgrounds.

14. The teaching resources this teacher selects for lessons about controversial environmental issues address the issues in a way that challenges stereotypes and commonly-held views, the aim being to encourage students to think about their own views.

Proposition:	Interview 1 evidence	Interview 2 evidence	Interview 3 evidence
10.	58-62; 85-103; 110-23; 126-30; 133-6; 142-5; 154-62; 180-5; 254-74; 276-89; 298-310; 313-8; 323-9; 339-47	27-39; 58-68; 83-87; 392-417; 421-430; 441-6; 450-7	230-2; 558-62; 588-604; 606-8
14.	13-18; 21-5; 28-29; 36-44; 46-9; 209-14; 216-20		292-302; 304-315; 318-20; 342-8

- **Group 6: Encouraging optimism**

7. Environmental problems, according to this teacher, are poorly understood, not as serious as is often suggested, and are likely to be solved by a mixture of individual and government action.

16. This teacher feels that promoting the polarised, unrealistic views of western environmentalists could be disempowering, and instead aims to encourage the students to have realistic attitudes, and optimism regarding taking action on environmental problems.

Proposition:	Interview 1 evidence	Interview 2 evidence	Interview 3 evidence
7.		460-7	492-502; 536-44; 617-26; 643-55; 656-79

16.		43-49; 52-6; 306-321; 328-41; 354-6; 361-3; 376-7; 383-5; 387-8; 494-6; 506-11; 513-16	438-71; 489-522

- **Group 7: Providing balance**

13. This teacher sees her role in teaching about controversial environmental issues as providing balance, encouraging students to state their views, and enabling them to make their own decisions, rather then imposing or promoting her own attitudes, since the students could be easily influenced.

Proposition:	**Interview 1 evidence**	**Interview 2 evidence**	**Interview 3 evidence**
13.		122-8; 299-306; 321-5; 352-359	232-5; 238-49; 474-87; 526-37; 548-58; 567-81; 606-8

Appendix 2.5
Percentage of data used as evidence in each case study

Case Study 1:
Overall 68% of teacher interview data used as evidence for one or more proposition.

Case Study 2:
Overall 86% of teacher interview data used as evidence for one or more proposition.

Case Study 3:
Overall 89% of teacher interview data used as evidence for one or more proposition.

Appendix 2.6
Table of key concepts based on cross-case comparison of beliefs propositions

	Case Study 1	Case Study 2	Case Study 3
Using the enquiry approach	"This teacher feels that an informed and structured enquiry approach is very valuable ... in terms of increasing self confidence and developing research skills ..."	"This teacher sees the value of the enquiry approach as enabling students to discover and evaluate things themselves ..."	"This teacher sees the value of the enquiry approach as encouraging students to be more involved in lessons and responsible for their own work, and as being more interesting to teach ..."
	"... but she perceives potential constraints relating to the ability level of some students and their expectations about the traditional teacher role."	"... but she perceives some potential constraints on its use due to the volume of work required of students at A level, and to differing teacher's interpretations of it."	"... but he perceives constraints on its use relating to a lack of time and resources, and the syllabus demands for in-depth knowledge about processes which require teacher-led activities."
Providing balance	"This teacher sees her role in teaching about controversial environmental issues as providing balance ..."	"This teacher believes it is essential to provide a realistic, balanced view of the issues ..."	"... this teacher believes that he normally maintains a position of balance ..."
		"... tries to provide access to a wide range of viewpoints ..."	"... to encourage students to ... identify different viewpoints.."

Encouraging independence	"This teacher sees her role ... (as) encouraging students to state their views ..."	"This teacher's aim ... is to (ask) other students for their views ..."	"This teacher ... aims to ... enable them to express their own environmental attitudes ..."
	"... enabling them to make their own decisions ..."	"... to enable them to make their own decisions ..."	"... he wants the students to come to their own conclusions ..."
	"... rather than imposing or promoting her own attitudes ..."	"... rather than to risk influencing them by imposing her own attitudes ..."	"... rather than imposing his own views ..."
Challenging students' views	"... aims to challenge students' ignorant simplistic attitudes towards environmental ... issues .."	"This teacher's aim ... is to encourage students to reconsider their own views ..."	"This teacher believes that students (may have) simplistic or judgmental attitudes ..." "(He) challenges students to justify their own views ..."
Encouraging empathy	"... to encourage students to empathise with other people and cultures ..."	"... and encourage empathy for other peoples or countries ..."	"... to encourage students to ... empathise with and respect those different views ..."

Appendix 2.7: Teaching Strategies

Lesson Analysis (summary of key issues in extracts)

Aim: Using examples from each of the teachers' lessons try to identify the means by which teachers try to present a diversity of views, or a dissenting voice, without stating it themselves, imposing their own view, or becoming actively involved in argument and debate (their stated aims).

- In what ways and to what extent does the teacher provide access to a variety of views?
- In what ways and to what extent does the teacher avoid stating his/her own views or becoming involved in an argument?

Case Study 1: Extract 1

- The teacher encourages diversity of views by directly challenging students' views with statements and questions. This causes students to express their views as they justify their position, and also enables the teacher to present another view through her questions and statements. The teacher's comments encourage students to empathise with other viewpoints, in this case those of indigenous people.
- In this extract, the teacher does express and also apparently try to impose her views on the students through her questions and statements, arguing that she needs to impose her views to get them thinking and talking. She does not explicitly encourage students to state their views, and some of the views expressed by students are rejected as 'trite' and 'callous', but her comments nonetheless lead the students to respond with further views and justifications.

Conclusion: The teacher's practices reflect her desire to provide access to a diversity of views, but not her desire to avoid imposing her own views. This appears to be a topic about which the teacher feels strongly and through which she wishes to encourage the students to empathise with indigenous people. It seems that challenging the students' views is more important than encouraging independent decision-making in this case, especially since the students are quite forthright with their own views. Whilst agreeing with the students that she should not, ideally, impose her views on them, she justifies her intervention in terms of encouraging them to think more deeply. It should also be noted that the teacher does not appear to influence the students' views, despite her arguments.

Case Study 1: Extract 2

- The teacher encourages diversity of views by asking a question which involved students making a value judgement about the importance of having a timber company at a tropical forest conference. One student expresses a view, and the teacher expresses another in a long statement which challenges the widely-held view that saving the rainforest is universally beneficial. The 'dissenting view' expressed by the teacher is one which might not otherwise have been heard and thereby broadens the debate. The teacher's statement encourages other students to express opinions, which they are then challenged (with questions) to explain or justify. Again, the teacher appears to be trying to encourage empathy for indigenous people.

- In this extract the teacher does express a very strong view in a statement, full of powerful metaphors. She then challenges students to justify their own views which leads to further discussion. She does not impose her own view, instead, after having made her point, she lets the students discuss the issue before moving onto another question with the issue still unresolved.

Conclusion: The teacher's practices in this extract reflect her desire to present a diversity of views by eliciting views from students and presenting a dissenting voice herself. Again, she appears to be trying to encourage students to have empathy for other peoples - in this case third world countries with rainforests. Although she expresses a strong viewpoint herself, she does not impose her views on the students, but allows them to come to their own conclusions. However, her aim of challenging students' views (by questioning them, or by expressing an alternative position) appears again to be given precedence over her desire not to bring her own views into the lesson.

Case Study 1: Extract 3

- In this extract, there is no great diversity of views, since the students and teacher are discussing a view of rainforest destruction which they had heard expressed at the rainforest conference. However, the teacher's summary of the talk differs in emphasis from the students', highlighting more clearly the third world perspective and again apparently trying to encourage students to empathise. The points which the teacher highlights appear to have been missed or ignored by the students, therefore the teacher's summary broadens the view of the issue presented.

- Nearer the end of the extract, the teacher appears to be expressing quite a strong viewpoint - suggesting that students should take action on environmental issues such as recycling, to reduce deforestation. Again, she appears to be highlighting aspects of the talk which the students may have overlooked. The students say very little about their own views of the issue.

Conclusion: The teacher's practices again reflect her desire to express a dissenting view about an issue, and to encourage students to empathise with the position of third world peoples. Her primary aim in this extract appears to be to present an alternative view of rainforest destruction - that of the people who live in those countries. Since the students seem unable to portray this view sufficiently accurately, the teacher steps in and gives strong support to this position. Although there is little diversity in the views presented in this extract, the teacher does add to possible diversity by presenting an unorthodox position. She does not impose this view, although it is stated quite strongly, especially in the final section which appears as an exhortation to take action.

Case Study 2: Extract 1

- The teacher encourages a range of views by asking questions, allowing student discussion and by challenging students' views with questions. This leads students to justify and enlarge upon their own views, and also allows the teacher to indirectly support or refute different views with her questions.

- The teacher does not impose her views, but she does seem to express them indirectly through her questions since the rhetorical nature of many of the questions implies disagreement with the preceding student comment. She also attempts to get the students to agree with her views, especially at the end of the extract, but then finishes by accepting their right to make their own decisions by apparently agreeing to differ.

Conclusion: The teacher's practices in this extract reflect her desire to provide access to a diversity of views by means of pointed questioning of students' views (including using rhetorical questions and sarcasm), thereby suggesting an opposing argument. By this means she encourages students to elaborate on their own views, and also manages to present a dissenting voice without having to state the argument herself.

Case Study 2: Extract 2

- In this extract the teacher encourages students to state their own views, by asking an initial question which involves students making a value judgement about whether NGOs should play a part in controlling Antarctica. She follows this question with neutral probes to encourage students to explain their views, and draws out a range of different opinions. The teacher allows students to discuss between themselves but two students are tending to dominate and not listen to others' views. In order to enable an opposing view to be heard, the teacher joins the discussion, using rhetorical questions to challenge one view and support another.

- The teacher expresses her views indirectly, but in a very persuasive fashion, through her questions and occasional statements. However, she does not impose her views on the students and concludes the extract by emphasising that they do not have to agree with her view.

Conclusion: The teacher's practices in this extract reflect her desire to provide access to a diversity of views by means of encouraging students to state their own views and challenging these views with pointed questions and arguments. She again encourages the students to articulate their own views but prevents a single view from dominating the discussion by presenting an opposing argument through her questions and statements. Providing a diversity of views appears to be valued more highly than avoiding involvement in the discussion, in this situation.

Case Study 2: Extract 3

- Again the teacher starts with a question which involves students making a value judgement, this time about whether national parks should be allowed to limit public access. She tries to provide access to a diversity of views by encouraging the student who expresses a minority view, and prompts other students for different views. However, again the discussion starts to be dominated by two students, so the teacher becomes more involved, expressing her views in a mixture of rhetorical questions and statements, supporting one side of the argument.

- The teacher expresses her views increasingly clearly and persuasively as the discussion continues, through her questions and statements. However, she does not impose her views on the students and instead opens the discussion to another student to present the opposing view when she feels she is getting too personally involved.

Conclusion: The teacher's main priority appears to be to provide access to a diversity of views, initially by having little involvement in the discussion but encouraging the students to provide this diversity. However, to continue to allow a diversity of views to be heard, she has to become more involved in the debate to prevent the more confident, articulate students dominating the argument. Again, providing access to a diversity of views appears to take precedence over not getting personally involved in the debate.

Case Study 3: Extract 1

- The teacher uses a chosen text to highlight a particular view of human impact on Britain's landscape, which may be a view which he feels the students will not have access to otherwise. There are no opportunities for consideration of other views in this extract, and the issue is treated as uncontroversial, despite the teacher's reference to the "very strong feeling in this article about the impact of humans", thus suggesting possible controversy.

- The teacher explicitly supports the view in the article with his statements (43-49 and 57-64). In the teacher's conclusion at the end of the extract, he expresses quite a strong view about the exploitation of tropical rainforests, and criticises other, more simplistic, views that some students hold. However, he appears to equate the view in the article - and his support for it - with the syllabus viewpoint, and does not state explicitly that this is his own view.

Conclusion: There is very little diversity of views or independent decision-making by the students. The impression is of the teacher illustrating a 'key idea' from the syllabus, rather than expressing a point of view about a controversial issue. He treats the issue as uncontroversial, therefore alternative positions are not considered, and none are raised by the students. However, by linking vegetation change in Britain with rainforest destruction, he is also challenging a commonly held belief that environmental problems such as rainforest destruction occur only in the third world.

Case Study 3: Extract 2

- In this extract, the teacher is talking informally with one student, and produces a dissenting voice to challenge the student's view. The teacher raises a 'value-question' about whether it would be desirable to manage vegetation changes caused by footpath erosion, and then challenges the student to justify his answer, using a mixture of questions and provocative statements. The teacher's stance enables him to provide an additional viewpoint, and encourage the student to consider alternative views.

- In this case, the teacher appears to be playing devil's advocate, explicitly expressing support for a deliberately controversial view. The student clearly understands the teacher's strategy because he asks, 'Are you going to tell me?' (line 60), clearly hoping that the teacher will expand on his side of the argument as well as playing devil's advocate.

Conclusion: In this extract, the teacher emphasises the potential controversy. The student's argument that detrimental vegetation change should be managed could have been accepted as an obvious conclusion, but the teacher encourages him to think more deeply. Again, he is challenging in some way, a commonly held belief. The diversity of views is increased by the teacher's strategy, but the teacher does not impose his view.

Case Study 3: Extract 3

- The teacher encourages a diversity of views by using a decision-making paper which explicitly requests the consideration of different viewpoints. He starts by asking questions about the different groups and interests, but when a student expresses an opinion with which he disagrees, he encourages other students to present a dissenting voice, and leads them to a slightly different viewpoint. This increases the diversity of views presented in the extract.

- In this extract, the teacher avoids stating his own viewpoint by encouraging another student to present the view he wishes to hear, rather than express it himself and contradict the initial student.

Conclusion: The teacher encourages the students to look at a diversity of viewpoints by using a DME, and does not impose his views, but does guide a student to provide a dissenting voice when he disagrees with a view which another student has presented.

How could the teaching strategies used in these extracts be categorised?

1. Eliciting students' views **(T1, 2, 3)**

- general (accessing a variety of views)
- specific (drawing in opposing views)

2. Enabling independent student discussion **(T1, 2)**

- low involvement
- enables independent decision-making

3. Challenging students' views **(T1, 2, 3)**

- by using questions or statements
- enables teacher to support or negate different positions

4. Expressing differing views **(T1, 2, 3)**

- extended statement of one side of an argument
- may include explicit rejection of students' views

There is obviously some overlap between these strategies (especially 3 and 4 - when does challenging students' views turn into expressing an opposing argument?) and teachers may use more than one at any one time, but these seem to be the main approaches used.

After further consideration, it was felt that expressing a differing view was essentially the same as challenging a student's view using a statement, therefore, category 4 (expressing differing views) was integrated into category 3 (challenging students' views) since this appeared to reflect more accurately the teachers' aims.

Appendix A3: Lesson Data

A3.1 Case Study 1, extract 1
A3.2 Case Study 1, extract 2
A3.3 Case Study 1, extract 3
A3.4 Case Study 2, extract 1
A3.5 Case Study 2, extract 2
A3.6 Case Study 2, extract 3
A3.7 Case Study 3, extract 1
A3.8 Case Study 3, extract 2
A3.9 Case Study 3, extract 3

Appendix 3.1
Case Study 1: Extract 1: Tropical rainforests

Side 2: 066 - 142 Tape restarts. Class working quietly and teacher writing on board.
T: Right! Hurry up and let's just get this finished. Just .. finish off reading through. If you've not finished making notes, just finish reading through. I've just put a few points on the board, to see if there's anything else that .. Don't look at those yet, you can look at those in a minute ..
Michael: So Miss this Maring thing, it's pretty er .. it's getting covered in .. (unclear) .. human crops? Is that true or ..?
Will: The Marings are the people
T: No the Marings are the .. tribe - the Maring people, yeah. That's the name of their ...
(Muttering amongst students - some misunderstandings being corrected I think)
T: I did say they were a tribe at the beginning .. 7 ..
(More student comments - inaudible)
Karen: Oh my god!
T: I did say it's quite difficult. Erm ... shhh!
Will: Why does it depend on altitude? Is it because it gets cold ..?
T: And sloping ..
Josie: You mean you didn't know?
Karen: I did know but I put Maring forest
T: Mmm .. Well they call it the Maring's forest because it belongs to the Marings, yeah.
Sarah: It doesn't belong to them, they just live there
T: Ah well that could open up all sorts of debates, Sarah, couldn't it? If it doesn't belong to them, to whom does it belong? And does that mean that indigenous people ...?
Sarah: It doesn't have to belong to anybody, they just use it.
Pupils: (Other responses inaudible)
T: And does that mean .. does that mean that indigenous peoples have no land rights?
S: No
T: By actually saying that you've actually .. touched on some of the main issues ..
Josie: I know someone who's just gone to work there. He's gone to be a forestry commissioner in charge of it.
T: In charge of the whole forest?
Josie: He's called ****.
T: You've got lots of very good contacts. We should start exploiting these people that your mother knows , shouldn't we?
Josie: My dad
T: Your dad knows, right ... Sarah when you said about it doesn't belong to anyone, no-one's forest, that's one of the arguments that indigenous peoples have had throughout the world that because they didn't have pieces of paper and titles to the land, erm, through law courts .. erm (students giggling in background) .. Sarah .. shhh .. Erm .. it meant that other peoples came in and took their lands away from them and displaced them from their normal habitat, where they normally live .. so ...
Alex: Survival of the fittest
T: Erm .. If that's ..
Sarah: I'm not saying it should belong to anybody else
T: That's OK to say that as long as you happen to be the fittest Alex. If you found you were not quite as fit as somebody else, you might not take such a view .. It was just a trite statement that erm, wasn't thought out properly.
A: Who me? Saying that?
T: Mmm, mmm.
A: Well it's nature isn't it, we're all part of nature, and those that can't survive die. Yes, if you're one of the, if you're one of the people that do die ...
T: Right, so what, what separates, what separates ..?
A: I wouldn't want to be one of the people that, that .. (unclear)
P(G): Miss, we're stuck on something
T: Yeah, well, I'll just say to Alex I'd just think about what separates human beings from other animal species .. and what makes us a social species, perhaps with social responsibilities and conscience. Erm, there's actually more to living on this earth than just .. 5 .. So you think..
P(G): So .. That's philosophy

57 T: Yes .. I know .. well there is a place for philosophy in geography, especially in decision
58 making work .. erm .. one of the things you will have to learn it isn't all just cold, calculating
59 science. One of the things you're going to have to take into account is .. humanity and human
60 responsibility, and the sort of moral and ethical decisions that people might have to make.
61 A: What is that responsibility?
62 T: Well that's one of the things you're going to have to think about isn't it? I mean I don't
63 know who taught you, erm .. RS or citizenship last year, but you should have actually
64 addressed all these issues last year.
65 Will: What's RS?
66 T: Religious Studies
67 W: It should be RE
68 T: No
69 W: Has it changed then?
70 T: It's always RS
71 Josie: Right er .. they're making it so that you can do it for a .. (unclear) .. now aren't they?
72 T: Oh tell me something I don't know S .. er ..
73 Will: It's a half GCSE
74 Justin: Half a GCSE
75 Alex: What's that?
76 Josie: What is?
77 Will: RS
78 T: Shhh .. erm, we're not going to go down that road .. just 'cause I've picked up a few people
79 on .. things that I thought were rather callous comments and not the sort of comments I want
80 caring geographers to be making. (class chatting - inaudible) Shhh. I'm imposing my values
81 on you .. Sarah will you stop talking ..
82 Alex: So if I say anything that you don't agree with ...
83 Sarah: I wasn't talking!
84 T: No Lisa, I'm looking at her .. Lisa will you stop talking all the time ..
85 Lisa: I'm trying to work out what the helter skelter is? (class noise rising)
86 T: Right, helter skelter ...
87 Lisa: It says it isn't in the helter skelter fashion ..
88 Will: It's a fairground ride .. It just goes round and round and round
89 Lisa: .. so it appears to be but it isn't.
90 T: Yeah, erm ..
91 Lisa: That's weird isn't it?
92 Will: Is it a cycle?
93 T: Which page are you on, Sarah?
94 Alex: It's an opinion Mrs. ***
95 Lisa: My name's Lisa!
96 T: Lisa, sorry, Lisa
97 Lisa: 45..
98 T: Right, wait a minute! Lisa, helter skelter means .. you go to the fairground round, you go
99 round the helter skelter, you come tumbling down .. So what they're saying, it's not all
100 tumble-down, it's not unplanned, it's actually .. it looks all higledy pigledy and, and .. a mess
101 in the garden but in fact it's very carefully planted and very well organised.
102 A: Mrs ***. All this is animals ... and it's my opinion, and it's not .. (unclear) .. freedom of
103 thought ..
104 T: That's fine. I know I was imposing my values on you 'cause I want you to start .. thinking
105 as caring human beings.
106 Andrea: You're not supposed to impose your values on us.
107 T: I know, I know I shouldn't do but I will occasionally .. 5 .. I have to get you thinking and
108 talking and discussing sometimes, so sometimes I will impose my view .. 3 .. or try to!
109 Cause it does get you talking. If I just accepted what you said and said nothing, no-one
110 would even think about it.
111 T: Right, erm ...

Appendix 3.2
Case Study 1, Extract 2: Save the forests?

1 T: Why do you think it was important to have a timber trade company there, B & Q there ..
2 giving us a feedback on .. giving a view on forestry?
3 Lisa: So it's not a one-sided thing
4 T: Yeah, it can't .. what do you mean it's not one-sided?
5 Lisa: Erm, then everyone being there that, they're trying to save the forest and not cut it down I
6 think ..
7 T: Well save, save the forest for who? If you say save the forest it's like sort of having all your
8 money and pushing it under the mattress and doing nothing with it. So you've got this, you've
9 got this pile of money that you've stuffed under your mattress, and it actually is no good to you
10 while it's sitting under the mattress. It doesn't improve the quality of your life, it doesn't
11 improve the quality of your existence, it's just your heirloom that you might take out, dust off
12 from time to time, but in the meantime you might be living in absolute poverty, erm .. with
13 ten million pounds stuck under your bed. So, you know, when you're looking at forestry as a
14 resource, and you're looking at the timber industry, you know, preserve the rainforest - for
15 who, for what? And what good's that? I mean that's what they would say.
16 Sarah: Oxygen!
17 T: Sorry?
18 Sarah: Oxygen
19 T: .. Oh you mean sort of the .. countries that, the countries that have all the forest in, it's their
20 duty to keep their forest there so that we can carry on breathing?
21 P: (vague murmurs of yes)
22 T: Are we going to pay them for that? .. 3 .. (more murmuring) Shh! Erm, don't start up your
23 little conversations! Are we going to pay them for that? .. 5 ..
24 Alex: Pay for what?
25 T: Well, Sarah said they should preserve their forest because we need it for recycling carbon-
26 dioxide and producing oxygen through photosynthesis, and I'm saying, fine but are we going
27 to pay them for that? Are we going to pay them for the oxygen we breathe?
28 P: (general replies of no)
29 Alex: It's a free good
30 Andrea: No, because they need it too
31 Sandy: We should do something like that, yeah.
32 Kevin: Yeah, if we don't pay for them, then they'll just chop it down anyway.
33 Alex: It's a free good
34 Kevin: But they'll just chop it down anyway
35 T: Yeah
36 .. 3 .. (more discussion between various groups of students - unclear)
37 Sarah: Can we do the next one now?
38 T: OK.

Appendix 3.3
Case Study 1, Extract 3: Who's to blame?

1 T: Right, workshop 4. Now, quite a few went into workshop 4: 'Who's to blame? A southern
2 viewpoint'.
3 Kirsty: Oh yeah, we went in that! It was a man talking really fast.
4 Sarah: They didn't come for like .. we only had quarter of an hour ..
5 T: No, wasn't that the indigenous peoples?
6 P: (Chorus of assent)
7 T: No, I'm talking about .. There was ... Josie, I'm sure you .. were you in erm ..?
8 Sarah: We went to number 4 anyway that was the indigenous people
9 T: No, that's workshop 5
10 (More discussion and shouting about where students went - unclear)
11 T: Right, erm .. I think there was only me then here in this particular group - because I know
12 there were some people there from my other group there when I went into it. Erm, it was
13 'Who's to blame? A southern viewpoint'. This was a .. the point ...
14 Josie: No he said .. it was .. we did go to that one
15 Kirsty: We did go to that one!
16 T: Oh you did?
17 Josie: We went to that one and then he was saying how erm, don't feel guilty about it, and that
18 it's these guys in Brazil that have done it, and that you've just got to help ...
19 Sarah: It's not just us!
20 Josie: .. but just don't feel guilty about it.
21 Sarah: He was so hard to understand though ..
22 T: Yeah, he was quite difficult to understand because he was ..
23 Sarah: .. he was gabbling away.
24 T: Well ...
25 Kirsty: I couldn't understand him
26 (other student comments inaudible)
27 T: Shh! Shh! I think one of the things you've got to appreciate if you, if you .. if .. (Students
28 talking in the background) .. It's actually an important point you're bringing up here .. if
29 you're going to listen and communicate with other people then because we all come from
30 different language bases and language is a barrier, erm, and that can be a problem, it can be a
31 problem in communicating. Either you don't have the language, or you're not talking .. you
32 might be talking the same linguistic language but not the same erm social and environmental
33 language.
34 Sarah: That's like that group we were in wasn't it? We had a Brazilian, an Italian, 3 Germans,
35 some English people ...
36 Josie: Yeah, that's like in our group. They never said anything.
37 Sandy: Those French people didn't talk once
38 T: Mmm. Well the .. the Germans in our group actually spoke up quite well, didn't they?
39 Kirsty: Two of them did.
40 T: Two of them did, yeah.
41 .. 9 .. (More student chatting and shouting out about who was in their discussion groups)
42 T: Right! So! Southern viewpoints! .. Let's keep you back on course! .. I hope when you've ..
43 give your feedbacks on Tuesday you're going to be a bit more er .. prepared to listen to each
44 other .. 'Cause you .. I expect you to be learning from each other next week. Southern
45 viewpoint then! Erm .. He was actually saying then - as Sarah said and Josie said .. he was
46 saying don't blame yourselves. We're quite responsible people. Don't think .. he was actually
47 saying to us, don't think of us as some sort of backward country, unable and incapable of
48 thinking for ourselves. Don't think that, as a nation, we are not capable of understanding that
49 this is a special environment and that we don't understand what's happening in this
50 environment. Don't think that everybody in Brazil doesn't regard, or .. have any regard for the
51 Amazonian rainforest, or the Amazonian region. He said this is my laboratory, this is my area,
52 this is my workplace. He obviously had a great affection for that area to work to. But he also
53 said, and don't you lot feel guilty for it. We're the ones who are exploiting the resources in
54 here, we're the people who are deciding to mine the minerals, we're the people deciding to
55 log, and we're the people looking for strategies. Kirsty?

56 Kirsty: Yeah but ... you know at the end bit when um that man was like ... conclusioning it all
57 - you know that man?
58 T: Yeah. yeah.
59 Kirsty: Yeah. He goes .. when they were doing that question he was going basically it's the
60 West - which is us - he didn't say anything ...
61 T: Yeah, well perhaps he hadn't heard. Not all of the people in there ...
62 Will: Bit of a poor conclusion really!
63 Kirsty: Yeah
64 T: Not everyone in there will have heard the erm .. the argument, his discussion and the chap
65 who was the chairman he probably hadn't heard what went on in that workshop, he couldn't
66 go to everything.
67 Kirsty: Yeah, but I would have thought he would have known if he's the chairman
68 T: Yeah, but .. well no, 'cause he said to us at lunch time that he's just come in on the day to
69 chair the session. That's what you do, you call someone in and say, we've got this conference
70 going, will you chair it for us and just give it a direction and a form. But he also had his own
71 agenda. He was going from a non-governmental organisation. I think, was he from
72 Greenpeace? He wasn't really .. he wasn't .. he was a forest ..
73 Sarah: He looked like an action man!
74 T: He had been from .. he had worked ...
75 Kevin: Wasn't it friends of something?
76 Will: Friends of the Earth
77 Josie: He was from Friends of the Earth, yeah.
78 Kirsty: He was from Friends of the Earth. He spent his time trying to save trees!
79 T: That's right. So ..
80 Will: Why didn't he have a beard and a woolly jumper?
81 (other comments inaudible)
82 T: Right! I'm gonna stop this in a moment! Um .. I'm just trying to pick up so you get one or
83 two of the points that came out. The .. 10 .. (students giggling and chatting in background)
84 Shh! But the final point that he made, the chap who was .. Sarah! The final point he made, the
85 chap who was talking about um .. don't blame, don't feel guilty about it was .. But he didn't
86 say you can't have any impact, he said what I'm saying to you is .. don't ... make sure you
87 recycle goods, make sure that the demand .. He was basically saying if the demand for these
88 resources falls then that will reduce the rate at which the rainforest is being deforested. So it's
89 only demand for bauxite for Aluminium cans. So if you recycle your cans then er
90 manufacturers will get it from recycled goods and won't have to go out into the environment
91 to mine more aluminium. If you erm recycle paper, or you have lower quality paper then -
92 well recycling you won't have to cut so many trees, you won't have to have so many trees
93 going to the pulp industry, if you um .. take a lower quality paper then you won't have to be
94 mining the kaolin, the white chalky substance that we use for paper making .. as a finish to
95 paper to give it a nice fine smooth finish on it. So he was actually saying, don't feel guilty
96 about it but there are things you can do to .. you know to reduce this rate. Because in a free
97 market if the demand for those resources drops and declines, then the rate of deforestation
98 won't be greater. The other thing that he talked about was actually .. the levels of destruction
99 and that's one of the things I want you to consider in your .. those people who are actually
100 going to be doing the .. 3 .. those people who are actually researching mining and HEP, and
101 erm .. one of the things .. (interruption - inaudible) .. yeah, one of the things I want to come
102 out perhaps on Tuesday is .. I think there has to be an acceptance, and there is an acceptance,
103 that the resources are being developed. It's how we manage that development, or how they
104 manage that development, which is interesting. Erm, and it's also what sort of development
105 do you go for? Which project you go for? Which is going to be the better project? And
106 hopefully, by Tuesday, you'll have worked out which is going to be the better project. You
107 might actually be able to .. I'm hoping that after your talks, at the end of it, we'll be able
108 to make some recommendations as to which we think is the way forward for erm ..
109 development in that part of the world - or any part, any tropical rainforest area.

Appendix 3.4
Case Study 2, Extract 1: Nuclear Testing

(Louisa has been describing how her mother wants to live in an earth bunker)
1 Teacher: Right OK! Very interesting. What else then? What else is a potential threat? .. 2 ..
2 Dan: Nuclear holocaust
3 Jake: Yeah ... (sarcastic)
4 Teacher: What?
5 Dan: Well, they could do nuclear testing.
6 Teacher: OK, impacts of nuclear testing especially over .. 2 .. the Pacific (writes on board)
7 Dan: Yeah, that's right
8 Jake: What's that got to do with the Antarctic then?
9 Paul: Nothing
10 Dan: Yeah it'll go down and drift down to the south pole
11 Paul: It's all perfectly safe. (laughter from other students) They do it about 50 miles down in a
12 coral reef thing. It doesn't matter.
13 (Other students break in to argue, but can only hear teacher over them)
14 Teacher: So that's perfectly safe then isn't it, if they just do it over a coral reef?
15 Paul: There's more nuclear waste in Sellafield than anywhere else on earth, and it's only a
16 couple of hundred miles away, and we're not in any danger.
17 (more student comments inaudible below this comment)
18 Teacher: But isn't it contained in Sellafield in a special way rather than just being allowed to
19 diffuse through the sea?
20 (again student comments inaudible below teacher - lots of input, arguing amongst each other)
21 Jake: In the last 24 hours there's been 2 things
22 Vanessa: What about Chernobyl though?
23 Dan: Chernobyl, that was ...
24 Paul: Well no they blamed all the radiation in Scotland on Chernobyl but it wasn't, it was just
25 that they were dumping waste there. They said all this nuclear waste had drifted over, and in
26 reality, it was just ..
27 Vanessa: Yeah but the people who .. (inaudible)
28 Teacher: But aren't ...?
29 Vanessa: .. being born with one arm
30 Paul: ... BNFL were dumping stuff.
31 Dan: Yes, that's because .. we .. they .. the Russians made a mistake
32 Jake: You're arguing the same as Paul, Vanessa. He's saying it's not good
33 (inaudible response from Vanessa)
34 Teacher: But aren't you basically .. Aren't you both basically saying then that if you're having
35 nuclear testing around that area, it's still likely to cause problems for the .. ecosystem?
36 (Murmurs from class)
37 Paul: No
38 Jake: No, not there. Not in the Pacific.
39 Teacher: You don't think it's got potential?
40 Paul/Jake: No, no potential. No potential. (laughter from students)
41 Teacher: OK, don't write it down then. // Vanessa, something else, another threat?

Appendix 3.5
Case Study 2, Extract 2: NGOs in Antarctica

1 T: OK, do you think, do you think that we can .. it is the sole responsibility of these different
2 states? What about NGOs, what about non-government organisations?
3 Dan: I think they should have a major say in it as well
4 T: Why?
5 Paul: Non-government, non-elected in other words?
6 Dan: Yeah, because they do sometimes have good qualities to point out
7 Paul: They're unelected though ..
8 Dan: (interrupting) Yeah, but often they're ...
9 T: Paul, Paul, make your point
10 Paul: People like Greenpeace aren't representation of a whole thing, they're not elected,
11 they're just a business ..
12 T: So is that a problem, that they're not elected?
13 Paul: They're just a minority .. they represent only the minority
14 Jake: And often they're ill-informed as well - the Brent Spar and things
15 Vanessa: Yeah, but it'll protect the continent. I mean it'll sort of not fall into the wrong hands.
16 Paul: Well how do you know that Greenpeace aren't wrong?
17 T: How do .. Why should Greenpeace be any more wrong than any other scientist? Are you
18 saying that Greenpeace doesn't have creditable scientists?
19 Jake: No, they don't have the facilities and the resources to erm .. have so much er .. research
20 stations as the government.
21 Lara: But they don't have darkened motives
22 Jake: How do you know?
23 Paul: Not darkened motives! Of course they do.
24 Vanessa: (jokingly) They're not evil Paul
25 T: Vanessa what were you saying? Why do you think they're needed?
26 Vanessa: (laughs) I was just saying .. Well they give some protection to the .. to the country
27 T: Is that necessary here?
28 Vanessa: Well, yes ..
29 Dan: Yes
30 Vanessa: It'd be plundered otherwise
31 T: Would it? According to the treaty, they're not going to plunder it.
32 Vanessa: Yeah well!
33 Dan: No, that's only because Greenpeace have a say in the treaty because they are sort of ..
34 Paul: What? They have nothing to do with the Treaty
35 Dan: Yes they do because they go into the meetings, they suggest ...
36 Paul: Oh yeah, alright then. But they're just a limited company in Britain, no more than that.
37 They're not elected, they're not ...
38 T: So ..
39 Vanessa: It doesn't mean they're stupid and ignorant, Paul
40 Paul: Well it means that they shouldn't have the right to rule the world if they're non-elected
41 Vanessa: We're not giving them the right to rule the world
42 Dan: Paul, we're not giving you the right to rule the world!
43 Paul: What?
44 Jake: What? .. Irrelevant Dan .. (laughs)
45 (Short pause during which muttering and laughter can be heard in background)
46 T: Do you think ..? What do you think would prevent the success of these Treaties? What
47 would prevent the success of them?
48 Paul: A war
49 T: A war. yeah .. (laughs)
50 Dan: Yeah, that's a good one ... nuclear holocaust
51 Paul: It's not that unlikely, I mean you got the Falklands war
52 T: OK
53 Jake: If some of the major companies .. er .. countries er .. opt out, therefore it's pointless .. if
54 they opt out of the treaty 'cause they'll just go ahead
55 Lara: Can they opt out?
56 T: Yeah course they can. They don't have to be there in the first place

57 Lara: I know but can they opt out and stay there
58 Jake: Yes, of course they can (other comments inaudible)
59 T: Oh yeah, what not sign the .. ? Well already certain things have not been .. have already not
60 been signed. I mean Australia pulled out of one of the treaties didn't they?
61 Jake: France
62 T: And France, so ..
63 Paul: Yeah
64 **264: 10.40** T: OK. Let's get some of these ideas down then. The treaty is important to ..
65 subvert individual power. That's the first point to make. Or to attempt to subvert individual
66 power. Because you have got lots of different countries involved here, lots of different
67 economic strength .. military strength, etc. So the last thing you want is one of those countries
68 to start exerting power over everybody else. OK, so the treaty, if nothing else, hopefully it
69 subverts the power of individual countries .. 6 .. OK? And .. 4 .. I think you need to add that
70 you need to consider the role of non-government organisations .. 2 .. in ensuring the success
71 of the treaty. So the role of non-government organisations .. 5 .. in ensuring the treaty's
72 success .. 7 .. needs to be considered .. 7 .. How many of you feel .. let's do it right this time ..
73 How many of you do feel that it's a good thing that Greenpeace are kind of on the edge of all
74 of this? Put your hands up. (Dan, Jake, Lara, Vanessa, Jenni agree)
75 T: Paul's ... (laughs)
76 Jake: It's a good thing to have all these green things. They raise questions and make the public
77 aware and make sure that the er .. some of these things do .. But to give them as much power
78 as to have a huge right of say into something like this is ridiculous. It shouldn't be done!
79 T: Right so you ..?
80 Jake: You should have them lobbying on the outside instead.
81 T: OK, so that's what you think their role is? (yes) And Paul what do you think of that?
82 'Cause you were kind of 'no' (laughs).
83 Paul: Well they shouldn't have any power, obviously, but yeah they can express their feelings
84 T: And does anybody think they should actually have power and be part of the .. decision
85 making?
86 Lara: Yeah, but I can't justify why I feel that.
87 T: Right. Well think about it. You must have said it for a reason. (Jake laughs)
88 Lara: Well because all governments have darkened motives and they're all corrupt ..
89 Jake: Why can't they? Why can't they have darkened motives?
90 Lara: Because they're environmentalist liberals
91 Jake: That doesn't mean that they're .. that they're not .. looking after their own er .. decisions.
92 Everyone's got priorities and their ..
93 Vanessa: Yes but they're .. but they're .. Well precisely but their priority is to conserve, not to
94 exploit like most governments
95 Lara: Yeah exactly
96 Paul: Well the government wants the best for the people .. (unclear)
97 T: OK. So Lara, why would you therefore want them in a decision making role?
98 Lara: Because um .. they er .. they, well they have a .. they .. (Dan laughs) .. their most
99 important consideration is the environment not money like any of the countries (T: uhuh), and
100 so er .. they'll help to even up the balance
101 T: And in a way, even if they do need money to run their business - as some of you have
102 called it - they can't be seen to be being un-green. They're, they're .. They supposedly want
103 their money to be more environmentally sound, don't they? To create a better environment,
104 so that aim is always there.
105 **302: 10.45** OK, and you need to consider - I mean obviously you've got your own
106 opinions - how strong their role should be in this, OK. Because they are involved in a lot of
107 lobbying - not just Greenpeace, any of these non-government organisations - erm, and I'm
108 going to give you an article in a minute on the earth summit in Rio ...
109 Jake: Would you like the Green Party in power?
110 T: and there were loads and loads of organisations here. Jake what was that question?
111 Jake: I was saying would she like the Green party as being er .. government? And she shook
112 her head.
113 Lara: No, no.
114 Jake No, why not?
115 Lara: But that's totally irrelevant
116 Jake: No, what's the difference?

117 Lara: Greenpeace is a different ..
118 Jake: They're still fighting for conservation as they call it
119 Lara: I know but they don't have very good ideas on education or ...
120 Jake: Just because they're politicians. What's the difference between politicians and a bunch
121 of hippies?
122 T: Go on Vanessa .. shh ..
123 Jake: It's ridiculous!
124 Vanessa: The point is .. OK, right. You've got a continent that is totally natural yeah. It
125 hasn't got any inhabitants ..
126 Jake: Yeah, why should a body though, unelected ...
127 T: No let her finish, Jake .. Jake! Let her finish!
128 Vanessa: Yeah right .. So it's totally uninhabited yeah, and you want to come in and exploit
129 it and take all the minerals out (Jake: yeah) and they want to conserve it (J: yeah) .. which is
130 fair enough because .. But, but then they don't have to have any sort of political training
131 (unclear) .. yeah but they don't .. nothing needs to be politically run in Antarctica. They
132 don't need to govern .. No but they don't you see, they don't need to say, OK right then we'll
133 give money, they have no idea how to do that. But that's a totally irrelevant issue ..
134 Jake: Exactly, and why should we give a job such as running a continent into the hands of
135 amateurs? (Confused uproar apparently from rest of class)
136 Vanessa: Yes, no but ..
137 Jake: They haven't got the resources to erm .. run a continent!
138 Vanessa: Yeah but it's a totally different ...
139 T: Jake, are we saying run it, or are we just saying be part of the process?
140 Jake: To run a continent, to have power, to have power over a continent is .. to run a
141 continent. It's exactly the same thing.
142 Vanessa: Yes, but it's a continent with no people on it
143 Jake: Well there could be people. That's the whole point. It's land
144 Paul: You're making a decision to preserve it without consulting ..
145 Vanessa: Well no, but Britain has got millions of people on it and you'd have to run the
146 people as well as land if you had ...
147 Jake: And you're running the people, the people who are trying to exploit it, you're running
148 them and saying no you can't do this, blah blah blah!
149 T: No, but are people saying that they are going to have the ultimate say? They're not saying
150 they're going to have the ultimate say, they just want them to be part of the process ..
151 Jake: Yeah they are part of the process ...
152 T:... and have as much say ..
153 Jake: .. in their lobbying process. But you don't want them to have ..
154 T: But they're not really though are they? They're not .. they're part of the process in
155 lobbying but they haven't got as much power as Argentina, Britain and the rest.
156 Jake: It's like putting a green dictatorship in to letting them have a say. It's exactly the same!
157 They're not voted in ...
158 Vanessa: No, no. no!
159 Paul: They're not elected at all
160 Jake: It's like saying Paul there was green. You'd vote him in! You'd say 'oh yeah, he can
161 have a say'.
162 Vanessa: No, no! Look, running a country, running a country ..
163 Jake: It's a democracy
164 Paul: If Hitler was elected
165 Lara: What's Greenpeace got to do with Hitler?
166 T: No Vanessa .. let Vanessa ...
167 Jake: Well .. with all his guards around him .. (laughter)
168 T: Jake! Jake! Jake! Let Vanessa respond to that. What were you going to say?
169 Vanessa: I was just saying do you not understand that running a country with people in it is
170 totally different to running a .. just a piece of wasteland (laughter). But basically you've got
171 to have the knowledge to be able to run schools, run underground systems ...
172 Dan: Which John Major doesn't have!
173 T: Let her finish
174 Vanessa: ... do you see what I mean?
175 Paul: There are other countries in the world that are hardly developed at all, they still have
176 governments

177 Vanessa: We want to conserve things, not run the country. So having power in Antarctica is
178 just ensuring their conservation.
179 Jake: It's not the point whether they've got people there or not
180 Paul: Brazil, there are large areas of Brazil which are totally empty, you still need a
181 government there. And the whole world is .. has to be governed so you have to have a
182 government
183 T: OK, have they got a government in Antarctica then?
184 Vanessa: No! (laughs)
185 Paul: Well they've got military people who go around ..
186 Vanessa: They're not governments!
187 T: But you've just said they have to have a government. Vanessa, hold on! They have to
188 have a government yeah? And you were also saying about you can't let anyone in, it just
189 turns into a dictatorship, it's almost like you need election. But you've got lots of countries
190 there which weren't elected to be there by anybody ..
191 Jake: No, I'm not talking about that ...
192 T: Hold on! Let me finish! Let me finish! They weren't elected to be there, and have you
193 actually got a government set up there?
194 Jake: Well they were elected!
195 T: .. Or have you got lots of different systems of government?
196 Jake: Well they were all elected!
197 T: No. You've got 42 signatories now, that's not the original people that signed the treaty,
198 they weren't elected in, they just came along and they said we want to be on the signatories,
199 and basically anybody can be.
200 Jake: They've got to be at the UN and they've got to be invited. That's what the thing said!
201 T: Right. Why then cannot ... 'cause I think .. I'm not saying, and I'm not saying I believe
202 this, I'm just posing this as a question: Why can't you have erm - if an NGO, not just
203 Greenpeace - perhaps another kind of Green Party, perhaps the South Oceans Coalition -
204 come along and say can we be a signatory on it? We don't want to be any more powerful
205 than anyone else, we don't want to have a dictatorship and say we are going to have the final
206 say or be an overseer, but can we have as much clout as all the other countries in Antarctica?
207 Paul: Well if they were elected by the people of the world like all the world governments
208 are, then yes, but they won't be. I mean how can you have an organisation like Greenpeace
209 that's got .. things all over the world? So it's not one country ... so what you do is get ..
210 T: But isn't that the whole purpose of Antarctica? To have representatives from all over the
211 world? To have someone that's not just interested in their country?
212 Paul: The world's people, they .. Right so the British people have a British government, they
213 elect them every 5 years, and so every government around the world is usually elected and
214 even if it, isn't it represents the majority of the people. And so then they ... these people .. the
215 government are the representatives of the people and they go to Antarctica and they make
216 decisions (right). So that's totally fair and totally elected ...
217 T: Isn't Greenpeace a world organisation, doesn't that have representatives..?
218 Paul: They're not elected, they're the minority of the people, and they're just a business like
219 any other (OK). They fund raise, they're not ...
220 T: Lara, do you agree with that? .. Do you think they can't be there because they're not
221 elected, they haven't been elected in their role?
222 Lara: I, yeah I do think they should be there
223 Paul: What? Well they don't represent the majority of the people. They shouldn't have any
224 power unless they're voted in
225 Lara: No, but a lot of people support them (laughter)
226 Paul: They're not! Greenpeace is a minority. It's not the majority, they're a minority.
227 Jake: They're fine in their lobbying situation
228 Vanessa: They might not as a body but they have a lot of support behind them
229 Paul: Well if they are then they should set themselves up as a political party and get into
230 power, they shouldn't just ..
231 Lara: Yeah, but that's not what they're interested in
232 Paul: Well if they're just a lobby group then they shouldn't have any power in Antarctica
233 then. And if they want power in Antarctica ...
234 Dan: They should have power in Antarctica because they're doing the right thing ...

373: 9.50 T: So do you think - if you look at these pictures in a minute - all these people that turned up to the Earth Summit, that were lobbying, that weren't elected. Are you saying they shouldn't be heard, they don't count?
Jake: No that's our bloody point!
Paul: They're there to lobby. That's why you have democracy, and you have all the political parties who were elected and you have lobby groups like the people who represent the gunmen, the shooting lobbyists (laughter) and the people who represent each of these minority groups and they try and lobby government. If they've got some money they bribe the government. It's like in America, the gun lobby in America got so much money that they can just pay a senator to pay for his election campaign and then when the senator doesn't do anything about increasing the gun laws so that you can have more guns, then they start to sort of ...
T: So that's right is it? That's right?
Jake: It's democracy!
Paul: It's reality!
Jake: It's democracy
T: Right, so basically you're saying that's reality therefore it's right?
Jake: The world isn't perfect, it's not right.
T: That's .. yeah, that's like saying ...
Dan: But that's why Greenpeace should be .. (unclear)
T: Surely Jake that's like saying, 'sod the third world, the world's not fair, that's just the way it is'.
Dan: Yeah it is
Jake: You can't put a bunch of amateurs who don't know ..
Paul: They're unelected!
Jake: .. they haven't got a .. they have one research station and that's sort of .. they got .. they just don't have the resources and probably don't have the knowledge, and they don't have the skill to run ..
Vanessa: That is ..
Dan: That is total bollocks
Jake: ... something like this
T: OK, Vanessa?
Vanessa: Don't have the knowledge to run something like what?
T: Vanessa?
Jake: They are a lobbying group, that is what they are?
Vanessa: Does that mean that they're totally un-intellectual, that they can't do anything
Jake: No, I'm not saying they're not intellectual
Vanessa: That **is** what you're saying. You're saying they ...
Jake: I'm not! By saying someone's unskilled, it doesn't mean they're completely thick. They're un-elected!
Dan: Excuse me, Jake!
T: Dan! Dan!
Dan: Do you think we should dump our rubbish down there?
Jake: I don't .. It's not to do with what I think ... I definitely don't want it .. It's about reality Dan.
Dan: OK, OK, OK .. we dump rubbish down there, yeah?
Jake: I'm just saying that Greenpeace and these non-government things shouldn't have a huge say
Dan: They should! They should!
T: Let him finish, Jake
Dan: They should have a say. We got to agree to disagree then.
Paul: What Dan, this is reality here. I can bet my life in 50 years time it won't be Greenpeace running Antarctica ever (laughter). ... With democracy, you have the power of the people. If there's a minority you don't want that to happen. You got to have corruption in a democracy
T: Sorry, say that again Paul I didn't hear you
Paul: When you have democracy, it always .. you always have to have like corruption (laughter) because .. otherwise the minorities wouldn't get their way. I mean well how do political parties .. who are they funded by? Business. Right, so you have breweries and everybody who has alcohol in Britain, they go - 'alright, here conservative party have a million', oh and .. 'oh wine is now good for you, oh great' (laughter). That's reality!

295 T: Yeah, we know that Paul, we know that.
296 Vanessa: What is your point here?
297 Paul: So if Greenpeace want some power they are going to have to represent the majority of
298 people who've got lots of money, and they're not .. there's no businesses who think
299 Greenpeace are a good idea ..
300 Dan There are!
301 Paul: .. because the environment and things cost quite a lot of money. So if Greenpeace get
302 loads of money together and say 'here, have a couple of million politician' and they'll sort it
303 out - or they can become a political party and get some power. Otherwise they're not gonna
304 have any say ..
305 T: But they will have a say through their lobbying
306 Paul: Yeah well lobbying you can always ignore it! (laughter)
307 T: Yeah, and isn't that the point? That's .. that's the crux of it. In the end, they can be
308 ignored. So in the end you could have .. different aims being pursued and you haven't really
309 got anyone overseeing to ensure that the treaties are successful, you're just hoping that
310 everybody has erm .. good intentions really aren't you? That's what you're basing the success
311 of Antarctica on - that in the end you can trust all these countries to have good intentions.
312 Jake: Yeah, but that's what you say if you want Greenpeace in there - you're gonna have to
313 trust them to keep their .. to keep on their aims..
314 T: Yeah, but you know .. their aims are more blatant aren't they? They are basically
315 environmental. That is their basic aim, isn't it? (Silence) You don't have to agree with me
316 Jake! (laughs) You couldn't bear to!

Appendix 3.6
Case Study 2, Extract 3: Park Full

1 T: Oh I know what I forgot to ask you. Do you think .. I'm interjecting here, or interrupting
2 even. Do you think (laughs) that it's right for national parks to put up a sign saying full?
3 Dan: Yeah, of course why not?
4 T: Put your hands up if you think yes.
5 Jake: It depends on the situation
6 T: Put your hands up if you think no. Put your hands up if you think 'depends'! (laughs) .. OK,
7 Justine, you're saying no?
8 Justine: Well it's um basically .. they should be open .. you should be able to go and visit them
9 (unclear) .. it shouldn't be up to one person to say no, this park's full and you can't come here.
10 T: So you kind of feel like because it's .. if you're an American citizen because it's in
11 America you have a right to see it? (yeah). What if you're from Britain do you have a right to
12 see it? I'm not saying you don't. Yeah, you think you do, why?
13 Justine: 'Cause it's part of the world and .. (unclear)
14 T: Yeah, OK, I think that's a good .. good point. Jake?
15 Jake: Nnnn no! If a car park's full, it's full, you can't get any more cars in there - even if it's
16 your right, you can't get any more in there so what's the point?
17 T: We're not talking about putting full on a car park. Really ...
18 Jake: In the whole park then ...
19 T: Stop! Stop! If the, if the .. if the national park .. it's not actually ever going full so that
20 you're bumper to bumper and you're shoulder to shoulder and you simply cannot move ..
21 Jake: Well what do you mean then?
22 T: We're talking about putting a sign saying full when it's reached it's, if you like, its
23 carrying capacity, that the impact might be bad ..
24 Paul: It'll never get full
25 T: .. So go on then .. so why is that OK?
26 Paul: It'll never get full
27 Jake: No, you don't want it bumper to bumper - if it stays open full time, all these people are
28 going to go in and it will get bumper to bumper and the impact to the place would be just
29 horrific. If they want to preserve it and actually let people have the right to see this place,
30 they've got to manage it in a way to stop people going in and out.
31 T: So how, so how do you .. decide when you're going to put that full sign up?
32 Jake: You look at the number of people in the park
33 T: So how do you know when the number reaches a ...?
34 Jake: You have an erm .. and you erm, you er .. look at the .. when there's a certain number ..
35 see how, what the impact is on the ground, the amount of litter, various er indicators like that,
36 and therefore you can tell how much is the capacity.
37 T: So you're gonna constantly be researching specific sites to find out ..?
38 Jake: That's what they are doing.
39 T: Yeah. To find out, yeah, the impact as well
40 **309: 11.50** Paul: If it's a national park, then you definitely have a right to go
41 T: So you, you're disagreeing with Jake?
42 Paul: Yeah ..
43 T: OK, so ...
44 Jake: I have a right to go into a car park but it's full, does that mean that .. I mean good god,
45 that's just ridiculous!
46 Paul: Yes, but the most of the national parks that they said are run for money. Most of the
47 national parks have a financial aspect of them - they've privatised almost every forestry
48 commission place, they're all run by a private company ...
49 Jake: That's just taking ... (unclear)
50 T: That's Britain, yeah. Shhh!
51 Paul: Right! And in America .. (unclear) .. and then they run, they have their little agencies to
52 run things like the national parks, the one that we went to on the field trip thing was run by a
53 company, rather than by something that's interested in any of the people, so ..
54 T: What company was it run by?
55 Paul: It's privatised, it won't be a ...
56 T: It's run by the National Trust

57 Paul: National Trust? It was definitely not the National Trust. It was forestry commission
58 combined with somewhere else, and the forestry commission has been privatised so .. I mean
59 it's the right of the companies running it ... (unclear)
60 T: So you think, purely because it's owned by someone who's private they can basically
61 choose to do what they want with that land?
62 Paul: Well that's what happens ..
63 T: No, I'm saying do you think .. I'm not talking about what has actually happened, I'm
64 saying do you think they have the right to ...?
65 Paul: No
66 Jake: Yes, they own the land. That means that I can do whatever I like in my parents' house
67 because they own it ...
68 Louisa: No, no
69 T: But you can't not if you're in a national ... Jake! Jake!
70 Jake: Are you saying people it's your right to walk through my house ...
71 T: Jake! Jake!
72 Jake: I'm not saying that, I'm saying my personal opinion is that no they should not have a
73 right, but in reality what I say will never happen ... a private individual will always have right
74 over his own land .. But in some situations they shouldn't!
75 Vanessa: No!
76 T: What ..? OK, Vanessa, go on.
77 Vanessa: Well um .. it's a really simple example but in our area there's a no smoke zone
78 where you can't burn fires in your own house. I mean it's your property but you can't burn
79 fires because it's bad for the .. air.
80 Jake: The air isn't your property though, the air is the property of all the people ...
81 T: No but it's ...
82 Vanessa: Yeah but it's your actual land you're burning the fire on..
83 Jake: But if it affects other people, then it is .. it is ..
84 Vanessa: Yeah well you'll be affecting other people
85 Jake: If you go and murder somebody with your own gun ... it's my gun, 'oh it's my right to
86 use it', that's not true is it? If your behaviour affects someone else ...
87 Vanessa: And also if your house is national heritage then you can't do anything with it ..
88 Jake: Yeah, because it's obviously valuable to the whole country
89 Vanessa: Yeah but it's your own, it's your own property.
90 T: Yeah, but that's ... and also isn't that also true of places in national parks? You can be a
91 private land-owner in a national park but you are not free to do whatever you like in that
92 national park. You are not free to put down pesticides and fertilisers ..
93 Jake: That affects other people
94 T: ... you are not free to actually build certain types .. you have to seek permission don't you?
95 So therefore what you were saying about private landowners being able to do what they want,
96 they can't.
97 Paul: They can do more than they should be able to
98 T: Because they're still overseen aren't they - by people?
99 Paul: But they do more than they should be able to ..
100 T: So are you saying therefore that if, if a wilderness region is in part owned by someone
101 who is a private land-owner, they should be allowed to do whatever they like to it, even if ..
102 even if it's gonna destroy that area?
103 Jake: No but they're allowed to put up a sign that says full on the thing, if it's gonna affect
104 the land of the thing, you know. If it's gonna be damaged by people then you don't want
105 them to come in and damage it ...
106 T: Right, OK. But that's quite rare isn't it, that you would have a small pocket being
107 managed in that way? Usually it's a whole overall scheme, that the park is managed. I mean
108 and what they're talking about here is saying at a certain point saying that the whole park
109 should be inaccessible, or certain, maybe certain areas of the park should be inaccessible but
110 decided by an overall body .. 3 .. -Do you think that's OK?
111 Paul: What that an overall body can tell a landowner ..?
112 T: No, I'm not .. I don't care about the landowner and their rights, I'm talking about for the
113 tourist. I'm talking about .. do you have rights as a tourist? Do you have a right to see what
114 you wanna see?
115 Paul: It depends what it is .. I mean you don't have the right .. there's museums are stacked
116 full of valuable stuff and you have to pay money to get in to it and they're the bloomin'

nation's property ... So that's one of the reasons why you should never have important things anything to do with money. You shouldn't be .. you shouldn't even consider having a national park and even think about charging money (right) .. 'cause it's the heritage of the country.
T: So you think therefore that yes you have a right to see it but you also must have restrictions against that right because it belongs to everybody - to protect it?
Paul: Well I think they have to try and preserve it. You can't just have it completely out of control.
T: Yeah, OK, Louisa?
Louisa: You only have a right ... I don't personally think you should .. they should be allowed to charge but I think they should be allowed to restrict entrance because otherwise in future there might be none left .. but it's part of people's heritage ..
361: 11.55 T: Uhuh .. Some of you seem to be quite cynical about this whole sort of national parks raising .. being there to raise money. But if you want .. and some of you (Jake tries to interrupt) .. Hold on! Let me finish! Some of you have actually said that you can't .. that you shouldn't be charging an entrance, you shouldn't be charging for people to use it, but therefore how are you gonna implement all your protections, how are you going to have something like VERP where you've decided a national park is for people to have a good visitor experience, how can you ensure that if you .. (Dan tries to interrupt) Let me finish! Let me finish! How are you gonna ensure that if .. where's your money gonna come from to do that? Because you're gonna have to provide facilities ..
Paul: Tax!
T: You're gonna have to employ someone to do the research, aren't you? You're gonna have to maybe erm .. protect paths, maybe you're gonna have to rebuild walls, that kind of thing. So where's all that money gonna come from?
Jake: Why don't you just do it by .. people who actually use it have to pay for it
Paul: That is so Thatcherite - we have free schooling, why ...
Jake: But people wouldn't want to pay more tax! If you said OK,. we're gonna put taxes up because we want to do this er national park, yeah, everyone's gonna go, 'yeah right mister. No way!' Everyone's gonna go berserk!
Paul: It should be treated the same way as education, you have free education, you have free access to heritage things - museums should be free, libraries should be free. If you say, alright, no tax, right - America's not quite no tax. The individual has to buy everything themselves, so you have areas of America which are total crime zones so people build their own little commune things and have guards at the doors, and the private individuals, the people with the money ...
T: It's true! That's true!
Paul: .. are living in fear of crime ..
T: That's like Los Angeles
(At this point it merges into another argument about taxation)

Appendix 3.7

Case Study 3, Extract 1: Man's impact on the ecosystem

1 T: Now then! This is where we come to the impacts. The gradual clearance of
2 woodland brought change to the area. And you'll remember me saying - because this is
3 the point where we finished - I said actually, I remember clearly saying to you, 'next
4 week we're off to the Cevennes' - do you remember? And I said 'and you will have the
5 opportunity to look at an ancient landscape which has had the impact of man over a
6 long period of time, and you will be able to look for yourself at the landscape of the
7 Cevennes and see the degree of change'. So I think there are strong links here between
8 the Cevennes and the Lake District, we'll come back to that one. The areas became bare
9 patches - why have we got bare patches, Tim?
10 Tim: 'Cause there hasn't had a chance for succession to be reached due to the
11 constant use of land.
12 T: Right and the woodland has gone. And what does that bring about it says?
13 Tim: Soil erosion and leaching.
14 T: And leaching. Just remind me what is leaching?
15 Tim: When the nutrients are drained out of the ground. It becomes less fertile.
16 T: That's right! In areas where precipitation exceeds evaporation, the downward
17 movement of water in the soil constantly removes mineral bases and that is referred to
18 as leaching. And that diminishes soil fertility. So we're now beginning to see the
19 impacts. We now go down to the bottom of the page. (Reads): During the last 5000
20 years, man has played an increasingly active role. Gosh, you could almost have
21 written the syllabus couldn't you? The words there are paralleling exactly almost word
22 for word the syllabus. An increasing role in determining the vegetation. In this latter
23 phase (and this is the bit to underline), it says OK there were changes in the climate
24 and these have undoubtedly had some effect but minimal, it says, compared to those
25 brought about by human interference. Even the marked changes in soil fertility
26 represent the side effects of forest clearance rather than leaching through increased
27 rainfall. So there's a very strong feeling in this article about the impact of humans.
28 Two little passages to further highlight, and then that'll be it for this article. Come half
29 way down the page and there's a sentence that starts two lines in - once oak elm forest,
30 once oak elm forest had established itself in 7000 BC, the organic context fell and
31 remained constant for 4000 years. Forest clearance is marked by an increase in organic
32 matter, possibly due to the leaching of soils taking place on the soil, on the slopes. In
33 time the total absence of woodland on the fells led to complete impoverishment of
34 soils, whose organic bases were never replaced by leaf litter ... Whereas Neolithic
35 farmers had had short term impacts, this article, Mark is suggesting what now?
36 Mark? The changes are ...?
37 Mark: Long term.
38 T: Long term. And it's interesting, isn't it? When coach loads of visitors from
39 Manchester and the north go out to the northern fells and they're looking out over
40 these huge great areas of cleared upland, they're saying, 'oh what a lovely natural
41 landscape that is'. And Nick, the answer to that is?
42 Nick: Rubbish!
43 T: Rubbish! Rubbish! Cobblers! Or words to that effect. It is not a natural landscape,
44 this is an impoverished landscape and one which has changed because of the impact of
45 humans. And to, to actually tie it all together, miss 3 lines and start again and it goes,
46 (reads): Thus man has not only brought about direct change in the vegetation by his
47 destruction of the woodlands but has triggered off a steady deterioration in the fertility
48 of the soils, making it now difficult for regeneration to take place unaided ..
49 UNAIDED! If you look at the forest cover of the Lake District and you start seeing
50 straight lines like this, what does that suggest about this kind of woodland - Toby?
51 Toby: It's managed?
52 T: It has been planted! This is aided planting of forest cover. And it is saying that
53 without aid, it would be very difficult for that forest to re-establish itself. And it then
54 says finally, (reads): Much of the present poor grassland of the upland fells for
55 example is the end product of thousands of years of pastoral mismanagement. Now I
56 think that that's not a long article but it actually helps bring together many of the key

ideas in the syllabus through one little example. And the next time that perhaps some of you may feel critical, or moved to be critical of third world countries who are exploiting their forest reserves, it might be worth you bearing in mind that from Neolithic to current times, most of our forest cover has been removed and we live in totally un-natural ecosystems. We have gone through that process of deforestation. Always .. um .. it always amuses me when younger children are so very quick to point the finger at developing countries and saying, 'well, you know, we wouldn't do that would we sir?' And yet, the evidence is that er forest clearance has taken place. Now, I think I'm going to tidy that up and leave that as it is, because time is going apace and I want to move on. I may supplement those notes with some extra ones but not at this stage. So, as far as I'm concerned I'm going to draw a line under that particular key idea.

Appendix 3.8
Case Study 3, Extract 2: Footpath erosion

1 T: Do you want to know what to do with that, George? Who's doing vegetation on your table?
2 George: We're just taking bits and pieces, we're not doing them separately
3 T: Oh you're not .. Right. We used that in the Cevennes. Let's look at it quickly - trampling
4 intensity and species. Right? So, from that diagram - can bracken stand heavy trampling?
5 George: No
6 T: Right, none there. Can it suffer light trampling?
7 George: A little bit
8 T: And no trampling
9 George: Yeah:
10 T: .It would survive there. Right. So, if the numbers of visitors increase ..
11 George: There'd be no bracken
12 T: What would happen to, what would happen to the bracken content?
13 George: It would decrease wouldn't it?
14 T: Right, OK. And if bracken went out, what species would replace it in the heavily trampled
15 areas?
16 George: Maybe these down there
17 T: Well those would be medium. Show me the heavy column. Right, greater plantain - yeah?
18 And your meadowgrass ..
19 George: Yeah
20 T: Poa something or other isn't it?
21 George: Yeah
22 T: Right! You did footpath studies of the Cevennes, right?
23 George: Yep, yep.
24 T: Where the footpath was more eroded away, what happened to the species?
25 George: Decreased didn't it? Or was it ..?
26 T: It did decrease - moved to the side but there were also certain species that were found in
27 some areas of the park. For example, that plantain was the sort of the dandelion looking thing
28 that we found and the grass that we were looking at for most of the time was that one. So
29 these are eliminated as trampling continues, and these are favoured by trampling. So what are
30 you doing to the composition of the vegetation?
31 George: Decreasing it
32 T: Well, you're favouring those species at the expense of these species. And how high is
33 meadow grass and say clover and plantain compared to say bracken?
34 George: It'd be higher won't it? In content if there's more of it?
35 T: Yeah, it'll be higher in content but what about in terms of physical height on the footpath?
36 George: It's be lower
37 T: That's' right. So you replace, a sort of richer, or higher form of vegetation for a lower
38 form. If you look at those footpath pictures you can see how not only do native species
39 disappear but the different species are found on different parts of the path reflecting different
40 degrees of trampling. So what are you ..? So, in a sense what is happening to the natural
41 ecosystem?
42 George: It's being changed
43 T: Yeah, I've rubbed it off. It's being changed. Now the question is, if that were extensive
44 over a large area, would you want to manage that degree of change?
45 George: If it was over a wide area, yes
46 T: Yes, and when you see pictures like that which could have been our footpath from the
47 Cevennes, what do you think you might be thinking about there? Has change gone too far?
48 George: Yes it has, because (unclear) I think
49 T: You think. That's your view. Right. What makes your view think that that is .. why do you
50 think that that is an area now that wants changing .. or managing?
51 George: Erm .. cause there's no vegetation, or you can't see any vegetation on the paths ..
52 T: Right, so who cares, who cares a monkeys about that anyway? I don't care! I don't care a
53 monkeys. Why? Why should I care?
54 George: 'Cause it's changing. Man has changed the ecosystem by treading on it.
55 T: Right, you justify why you want to do something like .. change it then.
56 George: (laughs) You're being obnoxious now

57 T: Now, I've always been obnoxious!
58 George: (offers some supporting argument - unclear)
59 T: Well but so what? Who cares? I don't mind.
60 George: Are you going to tell me?
61 T: No I'm not. I'd like you to justify why you want to change that.
62 George: What so you would rather let it .. go to rot?
63 T: Well you tell me why I shouldn't
64 (6 secs pause - laughter) Someone else interrupts to ask what a culvert is
65 T: Come back to me at a later stage when you've thought about an argument. A drained
66 culvert? Yeah. It's a small ditch to drain water away.

Appendix 3.9

Case study 3, Extract 3: Conflicting viewpoints

1 T: Right, let's look at another issue which is sort of undercurrent here - maybe a bit of a clue
2 here - Has anyone got another one before I give you a clue. Anyone like to give me what they
3 perceive to be another issue altogether here? Would anyone like to tell me then, what is your
4 role in this decision making paper? Who are you employed by? Look at the role card. Who are
5 you employed by?
6 Toby: National Trust
7 T: You're being employed by the National Trust. What is therefore you're kind of ..? Where
8 are you coming from then in approaching this paper?
9 Hannah: Conservation
10 T: Your interested in conserving the site. OK so give me an issue based on that. You're
11 coming from the point of view that you're coming to conserve the site.
12 Julia: To conserve it you'd want to stop people going on it really. That would like
13 completely conserve it. But you need visitors to keep the site going or you wouldn't fund it.
14 T: Right. So there we are. There is the dilemma isn't it? There is the conservation - visitor
15 clash or dilemma, dichotomy. Isn't this the problem that M*** has at Oxwich? What
16 is M***'s dilemma at Oxwich Bay which parallels this? Samantha? What is M****'s
17 dilemma at Oxwich Bay?
18 Sam: He has to cut off certain areas to allow succession, stability ..
19 T: He like to have stability but he also likes to have ..?
20 Nick: Money
21 T: Money, yes .. Does he ever want instability? (yes) Yes. And M***'s dilemma at Oxwich is
22 access and yet stability. But if it become too stable, what happens to diversity?
23 Sian: It dies out
24 T: It dies out. So there is that sort of issue of conservation versus visitors. There is this awful
25 problem that you want to conserve the site, and yet there are visitors who want to come to the
26 site. And I think there's one other issue which is buried in the letter, and I think it's almost
27 given to you as a throwaway. There's a throwaway down in the last paragraph of the letter.
28 What is the issue there, in the last paragraph of the letter? Read between the lines - what's it
29 actually tell you? Maria can you read out the last, can you read out, literally, the last
30 paragraph? In the letter, the hypothetical letter underneath where it says traffic, visitors,
31 erosion of vegetation. What does it then say?
32 Maria: (reads) A list of the parties interested in Tarn Hows site is provided in enclosure D.
33 You will naturally wish to consider the range of likely views held by these individuals and
34 organisations.
35 T: 'You will naturally', he says, 'you will naturally'. What is that if not a coded message?
36 What's he actually saying, Hannah?
37 Hannah: You have to.
38 T: You have to! You have to! Will you go to the little bit that tells you who are the interested
39 parties? Who are they? Have you found them yet? (pause, shuffling of papers) Have you
40 found the interested parties? There's no 'spot the loony' in this one. This is a decision making
41 paper which doesn't have a spot the loony but it does list the interested parties. Tim's got it
42 I think. And Maria - Maria's got it. So would you like to read it out again, Maria?
43 Which er reference are we at? (More shuffling) What's the er code reference? Enclosure
44 what? .. Enclosure D, would you like to read out the people there?
45 Maria: (reads) Cumbria County Council Planning Department, local residents, Ambleside
46 and Hawkshead Chamber of Commerce, British Association of Nature Conservationists and
47 Friends of the Earth, Recreation Ecology Research Group, The Youth Hostels Association,
48 The Ramblers Association, British Tourist Authority.
49 T: Now look, there's a pretty good list of people there. And, when you read through that list,
50 George, what's the first thing that strikes you? .. Apart from they're all desperately sad!
51 George: There's er ..
52 T: There's no friends of Carterton there is there? (laughter) No! I'm not surprised. What's the
53 first thing that grabs you with that list George?
54 George: There's recreation, and then there's conservation as well

55 T: Alright. Different groups. And you've recognised recreation and conservation. Would you
56 go as far as to say there are people there who might hold completely diverse opinions (yes), 57
and could you recognise who those people might be?
58 George: Erm .. local residents possibly and er .. the ramblers association
59 T: Right. Can anybody go forward? Can anybody .. so .. he says the ramblers association and
60 the local residents. Mark, you're going to be missing next week so let's test you while we
61 can - why do you think those are 2 diverse groups and what might their standpoints be?
62 Mark: Well quite a lot of local residents might be agricultural - farmers and er they might be
63 in conflict with the ramblers 'cause ramblers tend to walk through their farms
64 T: Yes - who else would agree with Mark that local residents can only be translated in that,
65 in that particular way? Who would take a contrary viewpoint? .. Anybody want to take a
66 contrary viewpoint? I'm not shooting Mark down I'm just ...
67 Julia: They may ... some of them may agree with the ramblers because they don't want to see
68 that area destroyed either.
69 T: Well Mark started by saying all the local residents are probably agricultural. Now we're
70 living ...
71 Mark: I was going to continue
72 T: Alright carry on then Mark.
73 Mark: Well .. they might not necessarily disagree .. some of the ramblers want to preserve
74 everything or it won't be fun to walk here, so they're not gonna be ...
75 Hannah: Yeah but they also won't trample everywhere
76 T: Oooh, anti-rambler! Group over there. Shoot on sight! .. (chatting and laughter from
77 students - unclear) .. Shh! OK, I just want to come back to Mark's point about residents. Can
78 you interpret the residents in another way? Yes, Nick?
79 Nick: Most of the residents probably are ramblers. They probably go walking through, that's
80 probably why they live there in the first place.
81 T: Quite possibly. Let's go back a bit. Residents. We're in the Lake District. We're in the
82 middle of summer time. What ... (Julia makes some comment inaudible). Right, Julia?
83 Julia: They're probably involved in tourism anyway ...
84 T: Possibly involved in tourism
85 Julia: ... they're making money out of visitors
86 T: Right, and therefore ...?
87 Julia: They're gonna want visitors there, aren't they? I mean they'll want a .. preserve it
88 otherwise visitors'll stop coming but they need to make money out of the site, so they've
89 gotta, they've gotta encourage visitors.
90 T: Right, OK, yes. Hannah?
91 Hannah: There's a difference between residents - those people that live there all the time, and
92 those people who have their .. cottages there. 'Cause they're both .. they're both residents
93 because they own the property and live there, but they're not .. they're gonna have different
94 viewpoints aren't they? The people who just have their little .. holiday cottages are gonna
95 have different opinions on what they should do than those people who live there all the time,
96 and see the visitors come and go ...
97 T: Excellent! Well stated! Well stated. And the point, without driving it home, because I think
98 the point has now been made, the third issue then is what here? (pointing at board) What is
99 the third issue - bearing in mind that you are now going to have to come up with some kind of
100 strategy? What is your third issue?
101 Maria: Is that whether to increase or decrease?
102 T: Well .. ye-es .. We'll come on to the .. strategies in a moment. Having gone and identified
103 you've got different people with different viewpoints and even residents can have different
104 viewpoints ..
105 Toby: Conflicting views and interests
106 T: Right! So a third issue is conflicting (writes on board) .. conflicting viewpoints. And I
107 believe that in this examination, in this first part, although a number of students will
108 undoubtedly have identified things like footpaths and bracken being trodden down and .. the
109 area being exceeded, it would be nice if you could somehow package your answer and sell it
110 back to the examiner by saying, 'look, I think there are some overall issues that are, that are
111 worth looking at here. First of all, I'm identifying the issues to do with the site and its
112 recreational capacity, and I'll undoubtedly tell you about those in some detail in a moment.
113 But there's also the issue of the fact that we've got to reconcile conservation against the
114 needs of visitors, and then we have to further resolve the conflict of people and their

115 different viewpoints. I'm delighted to hear people .. putting forward that different people are
116 going to have different viewpoints. So I think those are the main strands.