DEVELOPING ENVIRONMENTAL EDUCATION IN THE CURRICULUM
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Edited by
STEVE GOODALL
Developing Environmental Education in the Curriculum

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Preface

The 1990 European elections in Great Britain are remembered for bringing environmental issues to the forefront of political debate. For a short time, it seemed as though the weight of public opinion would bring about political representation of telling numbers in the European Parliament.

There has also been some cause for optimism with the Earth Summit in Rio de Janeiro and a reduction in intensive agriculture in many European countries.

This book appears, however, at a time when the importance of Environmental Education has been reduced, like that of other cross-curricular themes, by the total lack of mention of them in the Dearing Review of the National Curriculum. If a school is to offer a curriculum which is broad, balanced and relevant, as the 1988 Education Reform Act insists, then teaching by subject would seem to be limited in its effectiveness to fulfil these requirements.

Thus not only does reference to cross-curricular themes give a school a start in demonstrating what 'added-on value' they are offering but it would seem to be a requirement in offering a curriculum which will serve children well.

In addition to these pragmatic reasons, there remains the central issue of the vital importance to the future of the human race of getting our solutions to environmental issues right in both the short and long term.

The editor has included three additional contributions to those in previous books in this series. The case study and relationships between schools and conservation bodies are important if Environmental Education in schools is going to take on practical investigation and development. The impact of Information Technology upon education was, in the editor's opinion very much underplayed in the National Curriculum. One may consider it as a subject in its own right, enabling pupils to do new things in schools. However, the editor suggests that its greatest impact is as a cross-curricular theme influencing all subjects and themes, enabling pupils to model the environment and ask that all-important question 'What would happen if?' Therefore there is an additional, sixth, theme.

Thanks are due to Mark Lofthouse, Janet Edwards and John Owens for their help and encouragement, as well as to all the contributors for their prompt delivery of articles.
CHAPTER 1

Introduction – Environmental Education

Steve Goodall

The articles in this book reflect the controversy and range of opinions and responses which environmental issues seem to elicit from commentators and teachers. Despite the lack of consensus regarding causes and remedial action, however, it seems clear that certain issues are now established which need consideration. Despite the lack of guidance about cross-curricular themes, and Environmental Education in particular, in the most recent reports on the National Curriculum, schools would do well to recognise the importance of such issues to their pupils. Pragmatically, teachers will be reluctant to abandon all their curriculum design efforts and investment in resources. They would be hard-pressed to do better than regard consideration of environmental education as evidence of 'added-on value' which would have practical benefit to both pupils' long-term prospects and a school faced with OFSTED inspection.

Environmental education challenges, as well as relates to the other cross-curricular themes. The advice offered to schools by the National Curriculum Council in Curriculum Guidance 7 is clear. It is excellent in showing common study links with other themes but is not explicit enough in stating where attention might be focussed in order to obtain the clearest picture of what causes environmental problems. However, if environmental education is to be effective in raising awareness of the issues, one must identify, as unambiguously as possible, what those issues are. These issues may be summarised as:

— the growth of human activity;
— global warming and its energy implications;
— global food security;
— the population backlash;
— the information society.

(King and Schneider, 1991a)
There has been a huge increase in the range and amount of human activity since the turn of the century which makes increasingly large demands upon raw materials, energy sources and human resources. By compounding population numbers with average per capita consumption, one is able to obtain a rough indication of the totality of human activity. King and Schneider estimate a forty-fold increase over the century to date. (King and Schneider, 1991b) Human lifestyles which threaten the ozone layer are being curtailed as public awareness rises and demands action by producers.

Although the issue is complex, the ‘greenhouse effect’ appears to constrain the extension of an economic approach to social organisation. The exact consequences of the heating of the earth’s surface are still open to debate but there seems to be general agreement as to what the general trend is. The estimated rises in temperature caused by a doubling in carbon dioxide equilibrium concentrations is much greater than any alterations which have arisen through historical cyclic fluctuations. The effects are thought to be smaller at the equator and much greater at higher latitudes, altering thermal gradients, changing precipitation patterns, modifying climatic zones and thus changing agricultural viability.

Human activity which alters agricultural potential and removes fertile land for other purposes, such as mineral extraction or transport, may be linked in its effect with a rising world population. Technically, one may be able to grow sufficient food to support a population of twenty billion, but this is to discount the huge demands on energy which would be needed to supply sufficient fresh water to support the enterprise. Moreover the agricultural revolution, which has produced food surpluses, has not led to the elimination of hunger. Even in countries such as India, where the food is being produced in reasonable proximity to the hungry, problems of malnutrition and famine persist. Transport difficulties, from surplus-producing regions such as North America, to deficit areas, and the reliance of modern agriculture upon energy-expensive methods of producing fertilisers and weedkillers question the future of a surplus in food supply. There has also been a recent and dramatic fall in food reserves following the droughts since 1989 in North America. Harvests fell by 31% in the USA and 27% in Canada.

Large demographic changes are to be expected in the industrialized countries caused by their ageing populations and falling birthrates. Automation and increasing productivity may generate sufficient national product to maintain living standards with a reduced workforce, but a substantial burden will be placed upon pension and health care systems. Additionally, adjustments will have to be made to educational systems as the success of family-planning attitudes works its way through the population. Differences between countries in the opportunities for individuals to succeed could cause population movements. Conditions of tyranny and oppression and population pressures may well cause irreversible migratory waves North and West. The populations of rich countries will have to pre-
pare themselves to accept the reality of the need for cooperation to reduce, significantly, economic disparity.

The development of an information or post-industrial society is a major result of, and cause of, global changes. It is possible to communicate wise, constructive developments which could benefit the whole of humankind. It is equally possible to communicate racism, greed, envy and tyranny. Technological innovation has always influenced society’s behaviour patterns. A society after the Industrial Revolution had significantly different organisational and behavioural beliefs than its agricultural predecessor. An increase in information technology and automation may produce new products, industries and markets but one has yet to see whether it will produce jobs to match the level of employment of the industrial society it overtakes.

These issues are interlinked and it makes little sense to tackle them individually. Although this linkage makes any study complex, it does highlight the need for educationalists to begin to think on an international scale rather than just in localised contexts.

Environmental education has close links with the other four cross-curricular themes, sharing many of the same features of investigative study skills and bodies of knowledge. Pupils may research original and secondary sources, set up simulations, reach conclusions and discuss the validity of their ideas. The five themes share the possibilities for promoting the discussion of values and beliefs, extending knowledge and understanding, encouraging practical activities and decision-making and providing opportunities for pupils to make positive contributions to their community’s way of life.

Yet the human race is faced with the actualities of increasing air and water pollution, the ‘greenhouse effect’ and global warming, the increasing destruction of rain forests and its consequences for weather patterns. On all continents the deserts advance steadily and daily the extinction of species occurs whose role in world ecology has never been assessed. The importance of the environment has been forcefully set out by Bellamy:

—a need for a diverse genetic bank, especially to ensure continued food production;
—all life depends ultimately upon food production by plants which use the sun’s energy;
—diverse habitats are little studied and may contain unknown sources of medicine;
—clean air and water are finite resources;
—energy sources are finite;
—humans seem to need wild places for their spiritual and physical well-being.

(Quoted in Goodall, 1993a)

The finite nature of the world’s resources and fine balance between the existence and collapse of delicate ecologies has never been more clearly
brought to our attention.

Obvious as these environmental issues may appear to be, this is still an area of considerable debate and contention, especially among those practising scientists and philosophers of scientific methodology who adhere to Karl Popper's belief that Science is a discipline which continually tries to prove its ideas to be wrong. His methodology is one of conjecture and refutation. But Popper is concerned with how scientists ought to behave and not so much with how they do behave. (Castri, 1990) Whilst in Physics a number of hypotheses have withstood the rigorous testing of time and intellect to attain the status of theories, in Biology many hypotheses have not yet attained the same status through the rigorous accumulation of data. For example, while Newton's Theory of Gravity is now accepted (though the Graviton, the particle responsible for carrying the force of gravity remains a theoretical notion), Darwin's Theory of Evolution still evokes rather greater debate in scientific circles.

There is the opportunity for educationalists to concentrate upon fundamentally important issues for the human race. One must recognise that only the most impartial and rigorous of approaches to questions about the survival of the human race allows for useful conclusions to be reached. It is not satisfactory for challenges to current ideas to be met by the introduction of auxiliary hypotheses which are designed to meet the criticism. This methodology merely allows a hypothesis to survive a little longer despite mounting evidence that it is inadequate or even wrong. It is not a methodology of which Popper would approve.

'Global warming' is likely to involve a number of complex, interconnected factors. One may hypothesise that one recognises a particular product by its logo. However, no amount of empirical observation will overcome the 'Problem of Induction' which always prevents one from saying that the product will always be recognised by that symbol. One observation of a product without that trademark is enough to falsify the hypothesis. With an issue like 'global warming' an observation that thousands of hectares of rain forest can be seen burning everyday from space satellites may be an indicator that such production of carbon dioxide causes 'global warming'. The discovery of high levels of carbon dioxide in factory or traffic emissions does not disqualify forest burning as a factor. We may be dealing with a multi-faceted network of human activities which have to be unravelled. The National Curriculum Council advice:

...environmental education is the subject of considerable debate and that there is no clear consensus about many of the issues. (NCC, 1990a)

is correct in its caution and echoes similar difficulties to be found in issues connected with Citizenship.

In May, 1988 the Resolution of the Council and the Ministers of Education of the Council of the European Community stated that:

The objective of environmental education is to increase the public awareness of the
problems in this field, as well as possible solutions, and to lay the foundations for a fully informed and active participation of the individual in the protection of the environment and the prudent and rational use of natural resources.

(NCC, 1990b)

The Resolution suggested some principles which might inform environmental education:

— the environment as the common heritage of mankind;
— the common duty of maintaining, protecting and improving the quality of the environment, as a contribution to the protection of human health and the safeguarding of the ecological balance;
— the need for a prudent and rational utilisation of resources;
— the way in which each individual can, by his own behaviour, particularly as a consumer, contribute to the protection of the environment.

(NCC, 1990b)

Even here a subjective vocabulary is used: e.g. ‘possible solutions’, the ‘quality’ of the environment, and ‘rational’ utilisation of resources. These are, and have to be, political decisions which carry difficult, moral and value-ridden meanings. Effective environmental education accepts these problems and recognises the richness of them as sources of moral debate and development. The knowledge content of Environmental Education as suggested by the National Curriculum Council (NCC, 1990c) is reasonably straightforward provided teachers are able to use contemporary findings and developments. The skills of communication, numeracy, study, problem-solving, information technology, and personal and social interaction are broadly shared with the other cross-curricular themes. The positive attitudes to be encouraged include:

— appreciation of, and care and concern for the environment and for other living things;
— independence of thought on environmental issues;
— a respect for the beliefs and opinions of others;
— a respect for evidence and rational argument;
— tolerance and open-mindedness.

(NCC, 1990d)

It is important to note that there is a degree of selfishness here as each individual tries to survive or avoid censure by community norms or national laws of equality. Education about the environment, its climate, geology, water, resources, living systems and human activities can only provide a common framework within which the moral and values debate takes place. One cannot teach about the environment without ascribing values to the existence and desirability of certain kinds of environment. Pupils may debate how to ensure the best immediate and future use of the environment.
They may consider possible solutions to environmental problems taking into account conflicting interests and making informed choices. In doing so they are taking part in a moral and political debate.

One effective way of ensuring that the issues are fully identified is through practical, firsthand enquiry, research and investigation. In this respect one is fortunate that local environmental issues are so often a small-scale echo of much larger, global issues. Primary school conservation projects reflect major conservation programmes across the globe. Suggestions by pupils about traffic control around their school relate to national issues of road building, pollution and the use of finite resources such as land and fuel. Initiatives within schools to deal with vandalism, graffiti and the design of and access to buildings touch directly upon wider questions of how society might be governed, respect for the law and community relationships.

These connections reflect questions and assumptions back upon the possible solutions to environmental problems. However, these solutions are likely to depend upon how pupils see themselves in terms of their citizenship. Their responsibilities for the environment may be defined by whether they consider themselves as citizens of a community, country or international group like Europe. (Goodall, 1993b) As pupils search for answers and develop their perspectives and wider understanding so their own solutions to environmental problems may also change. Pupils’ ideas may challenge a school’s or their parents’ assumptions. These aspects need sensitive consideration for there are no right answers and teachers must be prepared to be challenged by pupils’ reactions and suggestions.

The complex and transient nature of environmental issues precludes any definitive statement of how those problems might be solved. Teachers should encourage pupils to seek their own logical solutions and to examine, impartially and critically, the solutions currently offered. We have to do this against the background of two, interrelated phenomena. Moral awareness has been lessened by the questioning of ethical structures and role models as an increasingly heterogeneous society gains access to more information. There may be a tendency to retreat from the daunting scale of global change. For example there has been a resurgence of political instability in various countries which has moved towards narrow nationalism or individualism.

At the same time the information society has enabled a progressively more complete awareness of environmental issues and problems to take hold of the public imagination. While expectations for solutions and research into possibilities are encouraged, the mass of information, uncritically presented can be overwhelming. Issues may be clouded, leading to repetition or compounding of errors. Spiritual, ethical and moral dimensions which redefine the quality of the environment and of human life should not be a matter of indifference, irrelevance or scorn but a vital ingredient in the search for a new humanity.
Schools could try to make sure that the learning opportunities they offer are a part of that essential process whereby solutions to environmental problems are found and implemented. Ideally every pupil ought to participate in seeking and defining the ‘right’ or best solutions among the many possibilities. This must mean appreciating the complexity of the network of issues to be considered. Further, pupils might be enabled to recognise that positive improvements to the environment can only be rooted in the motives and value systems that govern behaviour. Indeed the behaviour of nations, their alliances and society structures, in general reflects the behaviour patterns exhibited by their individual members. It is unlikely that any single action at government level will alter the environment for the better. It is more likely that it will require many individual acts, at the local level, in order to bring about significant change. If every individual were to buy ozone-friendly products, burn less fuel and join recycling schemes then producers would have to change. As consumers each individual does not have to accept what is on offer but can make demands upon the providers of goods and services. With the privilege of belonging to a relatively advantaged society comes the responsibility of seeking solutions to environmental and social problems.

In 1989, some forty decision-makers in Colorado came to realise the importance of global–local interaction. In cooperation between the United Nations Conference on Environment and Development and the Club of Rome, further national initiatives have continued in order to foster the message of local action. These initiatives in some thirty countries on five continents advocate local individual interactions with a view to transforming citizens from being inactive and isolated persons into becoming aware human beings ready to take cohesive action.

As empowered citizens we could know a lot about the environmental issues we face by using the information systems technology has provided. This does not make it easier to understand the issues or make decisions about proposed solutions. One has therefore to learn how to proceed in the face of uncertainty. Political decisions often have to be taken when the possible outcomes or contributory factors are not completely identified. As individuals or as members of institutions, one is increasingly asked to adopt attitudes and approaches of greater flexibility and adaptability. One real challenge is to make links of common understanding between the language and concepts of economics, morality and environmental issues. One might adopt environmental and moral considerations in the assessment of economic analysis; or take account of economic viewpoints in approaching environmental problems. Careful definition of the environmental issues and their causes and the kind of economics being used is needed. More effective ways of integrating environmental issues with macro- and micro-economic perspectives have to be found.

Citizens involved in local initiatives who are concerned about future generations and their well-being would have to balance and reconcile present
and future problems and values with needs. The creation of a sustainable world system suggests that profligate lifestyles need to be diminished by decelerating consumption of finite resources. An ethical imperative also requires one to alleviate poverty wherever possible. Current ethical decisions are largely undefined, diffuse reactions against environmental ills such as pollution or selfish exploitation of resources. In some countries, a business-based system of regulation offers some protection against various forms of malpractice, but local action based upon ethical consideration deserves to strengthen systems of regulation. Practitioners in the business of industry, commerce, service or conservation would then have to accept a higher degree of social and environmental responsibility in their own and consumers’ long-term interests.

The articles presented in this book offer a rich source of ideas, examples and discussions. They will be an aid to educationalists who wish to begin to explore the issues more thoroughly. The considerations are contemporary ones which should enable pupils’ educational experience to be relevant to the real world. Otherwise one may take refuge in having a curriculum which is sentimentalized or cliché-ridden. Quite rightly, HMI have already pointed out the biased nature of some curricula, which simply label all industrial and technological activity as environmentally, ‘bad’.

An ethical perspective of international relations cannot evolve unless it has a positive effect at a national, community and individual level. Schools could help foster positive attitudes on the part of pupils towards being involved in sound local initiatives which promote care for the environment at a local level while echoing global issues. The development of effective strategies to deal with environmental issues requires research into, and an understanding of, the real causes of the problems. This would be more easily done if pupils were encouraged to consider local problems and become involved in local initiatives to solve them. Schools would thus play an essential formative role in the development of aware citizens who would be equipped to tackle the complex environmental issues they will face in the future.

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