Primary school teachers' awareness of and motivation to teach environmental education in two European countries

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DECLARATION

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ABSTRACT

This study was initiated by an interest in discovering how, if at all, primary school teachers in two European countries perceive and practice environmental education. The thesis describes the historical development of the term 'environmental education', it discusses the main themes of environmentalism today, it refers to the global scene of policies and practices for environmental education, it addresses the status of environmental education in England and in Greece and finally it presents and discusses the conduct and results of an empirical study.

The study was undertaken with a sample of primary school teachers in England and in Greece, whose commitment to environmental education was unknown. It follows a qualitative approach based on a semi-structured interview together with some quantitative elements of analysis. The results of the study reveal that even though teachers support education ABOUT the environment, they are not aware of on-going and historic developments in environmental education. Furthermore, they do not have efficient training in environmental education and they lack information about it and about appropriate methods of teaching it. They exhibit anthropocentric rather than ecocentric approaches to environmental issues and also they hold technocentric beliefs concerning the environmental literacy of today's society.

Similarities and differences among the English and the Greek teachers emerged from the data collected. These are discussed in terms of the national curriculum of both countries, in terms of international documents, in terms of the type of support offered and how such support is utilised by teachers.

The thesis concludes with recommendations concerning the school curricula of both countries and with recommendations for further research.

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KEY TO ACRONYMS

CEC	Council of the European Community
CEE	Council for Environmental Education (UK)
DfEE	Department for Education and Employment
ENSI	Environment and School Initiative Project (of OECD)
FAO	(United Nations) Food and Agriculture Organisation
HMI	Her Majesty's Inspectors of Schools (in Britain)
IEEP	International Environmental Education Programme
IUCN	International Union for the Conservation of Nature and Natural Resources (The World Conservation Union)
NAEE	National Association for Environmental Education (UK)
NCC	National Curriculum Council (UK)
NGO	Non-governmental Organisation
OECD	Organisation for Economic Co-operation and Development
SCAA	School Curriculum and Assessment Authority
UNCED	The United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UWG	Urban Wildlife Groups
WCED	World Commission on Environment and Development
WWF	World Wide Fund for Nature

To my parents for their constant love and support.

INTRODUCTION

The title of this thesis is: "Primary school teachers' awareness of and motivation to teach environmental education in two European countries." The study aimed to investigate how a sample of primary school teachers in England and in Greece perceived the term 'Environmental Education', how they practiced it, what their skills and training in environmental education were, what their general ideas about the environment and significant environmental issues were and their ideas about the environment's status in today's society.

The researcher's interest in environmental education and more specifically in teachers and environmental education began during an undergraduate course at the University of Thessaloniki, in northern Greece. The title of the course was: 'Environmental Education'. Even though the actual words 'environment' and 'education' were familiar to the researcher, their coupling was something totally new. The course presented to students an overview of what environmental education is and it also focused on the practice of environmental education. The undergraduate class was divided into teams and each team undertook environmental projects, which they had to organise and to plan as if they were going to be taught to pupils in schools. The team of the researcher was fortunate in that its members were able to attend an environmental project that a primary school teacher was undertaking. The project dealt with water and the teacher demonstrated how he was organising various activities relating to water (experiments, visits to water services) based on a pack of activities provided by the World Wide Fund for Nature and Natural Resources. The results of the project, which lasted for 6 months, seemed amazing. Pupils worked in teams and they were very enthusiastic every time they were working on the project. This experience was very revealing as it showed without doubt both the teacher's and the pupils' deep interest in what they were doing. Often the teacher and the pupils stayed at school for longer hours than the normal day because they wished to work on the project and the formal curriculum did not allow them to do this during scheduled school hours. Thus, it was apparent both by what was observed and by the discussions which the researcher had with the teacher that environmental education can be very exciting but that there are problems of implementation, which need to be addressed and overcome. One key question that arose was whether teachers in general were willing to work such demanding

schedules on behalf of environmental education. Another question that arose, which may be more important than this, was whether teachers were aware of the aims and nature of environmental education. It was clear that the particular teacher observed was aware of various aspects of environmental education, primarily because he had made a personal choice to find out about this field of the curriculum. How many teachers, though, could afford to do or were willing to do the same, given the costs in both time and money? Hence, the author was motivated to undertake the present study.

It did not at the outset anticipate particular answers because the sample of the study was not identified as one which actively provided what might be described as an environmental education curriculum. The sample comprised both teachers who had practiced environmental education and teachers who had not done so. Teachers who had already worked on environmental education certainly had a good deal to say about environmental education. However, the responses of teachers who had not worked extensively on environmental education were also deemed important to investigate.

The first goal was to determine elementary teachers' awareness of environmental education by investigating their perceptions of the actual term 'environmental education'. This was done by questions that asked them to discuss their knowledge of the development of the term, to define it, to describe its curriculum content, to highlight its most significant aspect and to state what they consider as effective instructive methods in teaching it.

The second goal was to determine teachers' motivation to teach environmental education. This was done by questions that asked them to discuss their practices of environmental education, to identify their skills and training in it and to refer to stimuli that prompt teaching of environmental education in their classes.

Thus, teachers' awareness of environmental education and their motivation to teach it were the main two goals that this study aimed to address. Apart from the questions that addressed these two goals, there was a set of three more questions which asked teachers to discuss the significance and effect of environmental issues, to elaborate on their ideas about formal and informal sources of environmental knowledge and to discuss the current status of the environment. These questions complemented the two main goals of the study and they aimed to further illuminate teachers' general environmental ideas and how these ideas have influenced their

perceptions of environmental education. The data collected for the study also gave insight into the extent to which environmental education has been promoted and infused in schools in selected geographical areas of England and Greece.

The thesis is comprised of 11 chapters. The first chapter entitled 'History, Development and Definitions of Environmental Education' provides an overview of major international initiatives that have shaped developments in the field.

The second chapter entitled 'Environmentalism: Ecocentrism and Technocentrism' presents the two dominant distinctions of environmentalism; ecocentrism and technocentrism. A historical background of each ideology is described along with various economic and political approaches that characterise these ideologies. The chapter presents the debate between ecocentrism and technocentrism and it attempts to see how this debate has influenced environmental education.

The third chapter entitled 'Global Response to Environmental Education and present day status of environmental education in England and in Greece' provides general information on the way various countries have perceived and incorporated environmental education in to their educational systems. Then it describes in detail the status of environmental education in the National Curriculum of these countries. It discusses the nature of and approaches to environmental education in the countries' schools and reflects on teachers' involvement with it.

The fourth chapter is a literature review. It outlines previous research studies pertinent to teachers' practices of and ideas about environmental education. The review is not exhaustive. The studies described in this chapter were selected on the grounds that they are more closely related to the current study than other published empirical work.

The fifth chapter entitled 'Research Methodology' describes the accepted research paradigms, the debate between quantitative and qualitative research approaches and the various methods applied by researchers. Finally, it justifies the choice of the methodology that the current empirical study employed.

The sixth chapter describes the empirical study. It outlines the semi-structured interview and the questions that comprised the interview. It describes the sampling method and the way the sample of the study was acquired and then it outlines the response categories that derived from each question.

The seventh chapter presents the findings emerging from the English teachers' responses and the eighth chapter presents the findings of the Greek teachers' responses.

The ninth chapter discusses the findings of the English data and the tenth chapter discusses the findings of the Greek data. These chapters present a critical overview of teachers' awareness of and motivation to teach environmental education and of their general environmental awareness based on the findings of the data. The discussion chapters also present the key conclusions for each country.

Finally, the eleventh chapter describes and discusses similarities and differences between the key conclusions outlined in the previous two chapters. It attempts to relate the results of the current study to the results of previous studies that have been presented in the literature review, and to other background and theoretical aspects of the thesis.

1. HISTORY, DEFINITIONS AND DEVELOPMENT OF ENVIRONMENTAL EDUCATION.

A significant shift that occurred in science in the 16th century led people to start viewing nature as a machine that could and should be studied and written about by scientists. Nature was no longer viewed as a living organism. Chapter 6, which describes the prevalent research paradigms, refers to that change in more detail.

As a result of the above shift, environmental concerns started to appear as early as the 19th century, when people started realising the consequences of the Industrial Revolution both on the natural and on the social environment. Hence, forerunners of environmental education started to emerge (e.g. Nature Studies, Rural Studies, Field Studies) and organisations were established (e.g. Sierra Club 1892, the Audubon Society 1905) in order to promote knowledge about nature and to protect the environment.

However, it is only in the last three decades, since the 1970s that environmental education has developed in any organised sense. This chapter describes the major meetings, conferences and ensuing publications that have taken place worldwide regarding environmental issues and awareness. For the purpose of the present study, more attention will be paid to the aspects of these events, which had a particularly influential role in the development of environmental education.

In 1948 the government of France, UNESCO and the Ligue Suisse pour la Conservation de la Nature established the **International Union for the Conservation of Nature and Natural Resources,** the **IUCN,** otherwise known as the **World Conservation Union**. The United Nations' purpose in creating such a union was, and still is, to exchange information and experiences and to discuss major issues concerning conservation and sustainable use of natural resources. IUCN has worldwide secretariats in 30 countries. Apart from governmental agencies, it includes non-governmental ones as well. All its members can participate through assemblies on equal terms and decide the policies they should adopt. Holdgate (1997) talking about IUCN in the preface of his book, said that:

> *"IUCN is the oldest, broadest and in some respects most unusual world conservation body...[it also] had led many of the major world environmental initiatives of the past 45 years."*

One such major initiative, which was organised by IUCN and UNESCO was the **'International Working Meeting on Environmental Education in the School Curriculum'** in Nevada, USA, in 1970. The publication that was produced from that meeting, entitled: *International Working Meeting on Environmental Education in the School Curriculum, Final Report* (IUCN, 1970) gave a classic definition of environmental education. This definition stated that:

> *"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, 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, p.11)

This definition has been used as a 'blueprint' for the development of definitions of environmental education in other international meetings and publications. Most of the definitions of environmental education that have been formulated since that time have included features of the Nevada definition of environmental education. This meeting in Nevada in 1970 was also significant because it was the first international event which discussed environmental education rather than education for conservation only. The element of "*...practice in decision-making...*" has contributed to the development of education FOR the environment. It can be argued that this definition of environmental education, which has become a reference point, has given environmental education its current status and its basic characteristics.

Furthermore, this meeting led to another agreement among delegates according to which:

> *"...environmental education is a science centred multidisciplinary subject where most -if not all school subjects- could and should be incorporated."* (IUCN, 1970, p.11)

Four reports originated from the Nevada meeting. Their topics were: a) Concepts and Elements of Environmental Education, b) School Facilities, Staff, Space, Fixtures, Instruments and Equipment, c) School Outdoor and Community Facilities and d) Starting and Improving Environmental Curricula. Finally, the Nevada meeting concluded with recommendations, with suggestions and with an action plan programme for follow up work.

The significance of the Nevada meeting is great because it actually established the term 'Environmental Education'. For the first time the discussion shifted towards education about the environment and not education about conservation or field studies. Consequently, environmental education could now be defined and was acknowledged as an important feature of the school curriculum.

In 1972 an important event marked the beginning of a more worldwide concern for environmental issues. This was the **Stockholm Conference on the Human Environment**.

Before 1972 there were concerns over environmental issues such as marine pollution, conservation of natural resources, protection of migratory birds, but the majority of these concerns highlighted problems caused by industrialization. Environmental issues relating to developing countries did not appear on the agenda of concerns. Thomas (1992) discussing the pre-Stockholm period, suggested that both United Nations agencies and non-governmental groups had limited environmental visions as:

> *"They were reacting against the environmental impact of industrial development, especially contamination of land, air and water from industrial and agricultural chemicals."* (p. 23)

Additionally, Thomas (1992) claimed that the Stockholm conference constituted a challenge for non-governmental organisations and policy makers because prior to this they had been examining issues purely on a national level.

The Stockholm conference of 1972 acknowledged the existence of important environmental problems both in developed and in developing countries. At the same time, it acknowledged the need for action if these problems were to be solved. Environmental education was viewed as a very important way to encourage appropriate action to counter growing environmental problems.

The Stockholm conference produced an action plan for the human environment. It included 26 principles designed to help people improve their environment. This plan was divided in to three categories. The first category included information concerning the state of the world environment, the environmental problems and the management techniques. It also created a network for international exchange of knowledge on environmental issues.

The second category, called 'Environmental Management', according to Holdgate et al (1982):

> *"...had as its broad objective the development of comprehensive planning and the protection and enhancement of the environment for future generations."* (p.10).

The third category was entitled 'Supporting Measures' and it had three sections. The first was concerned with education, with training and with public information; the second with organisational arrangements and the third with financial and with other types of assistance.

As far as environmental education was concerned, it was suggested in Thompson (1993) that the Stockholm conference made the claim that:

> *"... the opening up of opportunities for public participation in decision-making is the most important of all the means to environmental education which should aim at developing a critical, moral and aesthetic awareness of our surroundings."* (p. 6)

The action plan of the human environment stated that the education in environmental matters is very important because in this way people will acquire responsible behaviour towards the environment.

It is likely that the Stockholm conference of 1972 will be remembered as the inter-governmental meeting which established the link between environment and development, taking into consideration the different socio-economic contexts of North and South. Furthermore, Palmer (1998) claimed that:

> *"...[the Stockholm conference] endorsed the need for environmental education, thus greatly enhancing its international status and perceived importance."* (p.7)

Criticisms addressed to the Stockholm conference were concerned with the fact that it tried to give technological solutions to environmental problems. Hence, ecological movements could not see how technology, the source of the environmental problems, could actually find solutions for them. However, its significance lies in the fact that it acknowledged the environmental problems that threaten the environment; it recognised the need for addressing these problems and it

considered environmental education to be an important solution to these problems through its capacity to promote action against the environment's degradation.

A very important achievement of the Stockholm conference is that it led to the establishment of the **United Nations Environment Programme, UNEP,** in 1975.

UNEP is an organisation with major significance in international environmental affairs. Some of UNEP's concerns/programmes are: environment and development, environmental awareness, Earthwatch, oceans, water, terrestrial ecosystems, arid land and desertification control. UNEP and UNESCO established the **International Environmental Education Programme, IEEP,** in 1975 which aims to promote the exchange of information and experiences in the field of environmental education.

Within the boundaries of this programme an international workshop was organised in Belgrade in 1975, entitled: **A Global Framework for Environmental Education.** It aimed to discuss trends and problems in the field of environmental education and to define directions towards which environmental education could develop. The workshop led to the formulation of the *Belgrade Charter* (IUCN, 1975) which reported that the goal and objectives of environmental education are:

> *"...To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions to current problems, and the prevention of new ones.*
> *The objectives of environmental education relate to helping both individuals and groups: to acquire awareness of and knowledge about the environment and its allied problems; to acquire new social attitudes of concern that will motivate active participation; to acquire the skills for solving problems; to be able to evaluate environmental measures and education programmes in terms of ecological, political, economic, social, aesthetic and educational factors; and to participate in appropriate action to solve problems."* (UNESCO, 1975)

It also reported guiding principles for environmental education, according to which environmental education should:

> *"1. consider the environment in its totality: natural and man-made, ecological, political, economic, technological, social, legislative, cultural and aesthetic;*
> *2. be a continuous lifelong process both in-school and out-of-school;*
> *3. be interdisciplinary in its approach;*
> *4. emphasize active participation in preventing and solving environmental issues;*

5. examine major environmental issues from a world point of view, while paying due regard to regional differences;
6. focus on current and future environmental situations;
7. examine all development and growth from an environmental perspective;
8. promote the value and necessity of local, national and international cooperation in the solution of environmental problems." (UNESCO, 1975)

The Belgrade workshop of 1975, which focused on environmental education, exhibited an ecocentric approach towards the environment. It discussed a "new global ethic" which could combine equitable distribution of the world's resources with development that will benefit all of humanity. These new approaches towards the environment were reflected as well in the goals and objectives of environmental education that were presented above.

Its significance is crucial because, on the one hand, it acknowledged the environmental problems which had already been discussed at the Stockholm conference of 1972 and, on the other hand, it promoted environmental education based on ecocentric ideas (e.g. active participation for solving problems, examination of development and growth from an environmental perspective).

Two years later, in 1977, a significant conference for environmental education was held in Tbilisi, Georgia USSR. It was the **First Intergovernmental Conference on Environmental Education** organised by UNESCO. Attendants at this conference were from 66 UNESCO member states and there were also representatives from numerous non-governmental organisations. The agenda of the conference included the following main topics:

"major environmental problems in contemporary society; role of education in facing the challenges of environmental problems; current efforts at the national and international levels for the development of environmental education; strategies for the development of environmental education at the national level; regional and international co-operation for the development of environmental education: needs and modalities." (UNESCO, 1977, p.5)

The Tbilisi Conference on Environmental Education of 1977 was largely based on the Belgrade workshop as it reiterated the goals of environmental education that were formulated there. The Tbilisi Conference defined environmental education as a life long process which needs to be 'holistic and inter-disciplinary'. By holistic and inter-disciplinary is meant that the environment should be viewed in its entirety including all aspects of life (social, political, economic, technological, moral,

spiritual). Environmental education should not be limited to one subject but it should permeate all subjects of the school curriculum. Its inter-disciplinary implementation in the curriculum should be accompanied by first hand experiences and practical activities. Hence, all these approaches will lead to a new environmental ethic which will respect and protect the environment. The publication that was produced at Tbilisi entitled: *First Intergovernmental Conference on Environmental Education Final Report* (UNESCO, 1977) suggested among many other things that:

> *"(1) Environmental education is an integral part of the education process. It should be centred on practical problems and be of an interdisciplinary character... (2) Environmental education is a lifelong process and should not remain confined within the formal system... (3) Environmental education should not be just one more subject to add to existing programmes but should be incorporated into programmes for all learners, whatever their age...(9)... it should represent a means of introducing a certain unity into the education process in the minds of pupils and enable them to manage the environment in which they live through the judicious use of resources."* (UNESCO, 1977, p.19, 20).

The Tbilisi Conference acknowledged the goals of environmental education as they were formulated at the Belgrade workshop in 1975. These dealt with awareness and concern about the economic, social, political and ecological interdependence and with the acquisition of knowledge, skills, attitudes which will nourish positive attitudes and behaviour towards the environment. According to the *First Intergovernmental Conference on Environmental Education Final Report* (UNESCO, 1977) the ultimate aim of environmental education was:

> *"...to enable people to understand the complexities of the environment and the need for nations to adapt their activities and pursue their development in ways which are harmonious with the environment."* (UNESCO, 1977, p.12)

The Tbilisi Conference presented a 3-fold definition for environmental education; education FOR the environment, ABOUT the environment and IN/THROUGH the environment.

Education FOR the environment is concerned with developing positive attitudes and fostering positive actions towards the environment. It helps pupils realise the importance of maintaining the environment and taking action while considering conflicting interests and various cultural perspectives at the same time.

Education ABOUT the environment refers to knowledge of the environment that pupils can acquire on many topics, such as climate, water, plants, animals, air.

Education IN/THROUGH the environment refers to the environment as a resource which pupils can use in order to carry out in-depth investigations. First-hand experiences and field studies stimulate their interest and curiosity and promote effective learning and co-operation.

The Tbilisi conference of 1977 constitutes an important landmark in the history of environmental education because it brought together in a coherent fashion previous developments in environmental education. It defined the goals, the characteristics and the content of environmental education. All these (goals, characteristics, content) reflected as well the attempt to create a "new global ethic" as discussed in the Belgrade workshop in 1975 aiming to lead to new perceptions regarding man and his relationships with nature, with society and with other people.

Such conferences and meetings contributed immensely to the firm establishment of environmental education on the international stage. The United Nations Environment Programme (UNEP) estimated that environmental issues acquired wide recognition during the 1970s, hence environmental perceptions also broadened.

Going forwards in the 1980s, the most important events included the launching of the *World Conservation Strategy* in 1980. It was published by IUCN/UNEP/WWF and it was endorsed by the Food and Agriculture Organization of the United Nations (FAO) and UNESCO as well.

The aim of the *World Conservation Strategy* (IUCN, 1980) is to promote sustainable development by stimulating a greater interest in the conservation of living resources, which constitutes one of the prerequisites for sustainable development. According to it:

> *"...the Strategy identifies the action needed both to improve conservation efficiency and to integrate conservation and development."* (IUCN, 1980, p. IV)

The *World Conservation Strategy* (IUCN, 1980) introduced the notion of interconnectedness that should exist between conservation and development. Palmer (1998) reminds us that:

> *"A key aspect of its recommendations is the integration of conservation principles and objectives with social and economic development."* (p.61)

The terms development and conservation have also been defined by the *World Conservation Strategy* (IUCN, 1980). Hence, according to it, development is:

> *"...the modification of the biosphere and the application of human, financial, living and non-living resources to satisfy human needs and improve the quality of human life."* (IUCN, 1980, Paragraph 3 from the Introduction.)

And conservation is:

> *"...the management of human use of the biosphere so that it may yield the greatest sustainable benefit to preserve generations while maintaining its potential to meet the needs and aspirations of future generations."* (IUCN, 1980, Paragraph 4 from the Introduction.)

The content of the *World Conservation Strategy* (IUCN, 1980) discussed the contribution of living resources to humans, it set out the prime conservation issues and it put forward ideas for achieving the above.

It set three priorities according to which there should be reasonable use of natural resources. These priorities were that: future generations' needs should be taken into consideration; wild species and genetic diversity should be protected and finally ecological processes should not be disturbed by human impact. These are three aims which, provided they permeate all development programmes, should ensure that conservation can be achieved alongside development.

The *World Conservation Strategy* (IUCN, 1980) also discussed the role of education, which can develop a new ethic towards the biosphere where human societies will live in harmony with the natural world. As far as school curricula were concerned, it has suggested two ways of implementing environmental education; one as an intrinsic part of other subjects and the other as a separate subject. It has placed great importance also, on teaching materials such as audio video aids, posters, pamphlets and on wildlife clubs for children. Concluding this section of the *World Conservation Strategy* (IUCN, 1980) (13. Building support for conservation: participation and education), it claimed that:

"The need for environmental education is continuous because each new generation needs to learn for itself the importance of conservation." (IUCN, 1980, Paragraph 14.)

The *World Conservation Strategy* (IUCN, 1980) was addressed mainly to governments and governmental bodies, to conservationists, to development practitioners such as industry, commerce and trade unions. Some of the priority issues it has identified were: reduction in quality and quantity of agricultural land, extinction of species, subspecies and varieties, overexploitation of fish and other wildlife, climate alteration and air pollution, lack of information. Its significance has been great because it attempted to explain how conservation and development can co-exist and it has emphasised the importance of living resources not only for development but for conservation as well. As far as environmental education was concerned it has suggested ways as to how it might be implemented in school.

In 1983 the **World Commission on Environment and Development** was established. Its members came from 22 nations. For more than three years the members of the Commission, people with various professional backgrounds (scientists, ministers, diplomats, law makers etc.) were called to work for 'a global agenda for change'. The United Nations had asked the World Commission on Environment and Development to propose strategies for achieving sustainable development, to recommend ways to deal with environmental concerns and environmental issues. The *Brundtland Report*, otherwise known as *Our Common Future* (WCED, 1987) was the product of this project. The *Brundtland Report* took its name after the prime-minister of Norway at that time, Gro Harlem Brundtland, who chaired the WCED.

Sustainable development constituted a main feature of *Our Common Future* (WCED, 1987). The actual definition of this within the report is:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- *the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and*
- *the idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs."* (WCED, 1987, p.43)

Our Common Future (WCED, 1987) claimed that poverty in Third World countries should be managed in such a way that economic growth and development can co-exist and lead to sustainable development. Hence, poverty has been presented in it as a cause of environmental degradation. However, this assertion begged a quite different question that wonders whether poverty is really a cause, or is it an effect of environmental degradation. This is a criticism made of *Our Common Future* (WCED, 1987) which considered poverty and underdevelopment as causes of environmental destructions. De La Court (1990) commenting on the publication *Our Common Future* (WCED, 1987) claimed that:

> *"Although it issues a very clear warning against the hazards of future industrialization, it concludes that we must industrialize... if poverty is to be overcome."* (p.23)

In the same spirit, Anupam Mishra, an Indian environmentalist, cited in De La Court (1990), argued that the Western standard of living, not poverty is the cause of environmental destruction because countries try to achieve this standard by exploiting resources uncontrollably.

Thomas (1992), discussing *Our Common Future* (WCED, 1987) acknowledged that sustainable development and environmental growth were two suggestions that were put forward by this publication as a solution to environmental problems.

The role of education was also emphasized in *Our Common Future* (WCED, 1987). Education along with religion can help:

> *"...provide direction and motivation in forming new values that would stress individual and joint responsibility towards the environment and towards nurturing harmony between humanity and environment."* (WCED, 1987, p. 111)

As for environmental education, the same Report suggested that it should be included in school curricula throughout the other disciplines in order to:

> *"...foster a sense of responsibility for the state of the environment and to teach students how to monitor, protect, and improve it."* (WCED, 1987, p. 113)

Our Common Future (WCED, 1987) extended the discussion that the *World Conservation Strategy* (IUCN, 1980) had initiated for conservation and

development. It has defined sustainable development and it has produced strategies that can lead to sustainable development policies.

The year 1987 marked ten years after the first intergovernmental conference on Environmental Education in Tbilisi, Georgia, USSR. Thus, the **Tbilisi Plus Ten Conference** in 1987, otherwise known as the **Moscow conference** was organised that year by UNESCO and UNEP. It aimed to evaluate environmental education during the 1980s and to plan new strategies for the coming decade.

The fact needs to be stressed that this meeting took place at a time when environmental problems had made a strong impact on the international scene (e.g. Chernobyl, Bhopal, the hole in the ozone layer, acid rain, etc.). Poverty in Third World countries had been a permanent feature due to overpopulation and underdevelopment. Thus, ten years after the Tbilisi conference of 1977 the environment's situation was actually seen to be worsening rather than improving. The Moscow conference in 1987 not only enhanced the importance of environmental education referenced in Tbilisi ten years earlier, but also acknowledged it as a factor which could promote sustainable development. It stressed the need for widespread public awareness as a first step to overcome environmental hazards. This conference enriched environmental education with the notion of sustainable development since this type of development was acknowledged as the main solution to environmental problems. It considered the links between the lifestyles of humans and the quality of the environment as an important feature of environmental education. It is believed that once such links are made, it can provide people with an understanding of environmental issues which, hopefully, will encourage and motivate people to act in a more environmentally friendly and concerned manner.

One year later, 1988 marked the **European Year of the Environment**. In May 1988 the European Community passed a Resolution in order to promote environmental education in all European Community countries. The *Resolution of 24th May 1988* (CEC, Journal of the European Communities, 6/7/88) considered public awareness of environmental problems as one of the objectives that environmental education should have. Also, it talked about informed individuals who would play an active role and have a say in the protection of the environment and the possible solutions of environmental problems. It produced four guiding principles which were:

- *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 utilization of natural resources,*
- *the way in which each individual can, by his own behaviour, particularly as a consumer, contribute to the protection of the environment.* (CEC, Journal of the European Communities, 6/7/88)

Thus, during the 1980s sustainable development has been emphasized as an essential element in the promotion of environmental education. Its concerns lie with the quality and the state of the world through succeeding generations. Palmer (1998) claimed that sustainable living:

> *"...aims to help people understand the inter-dependence of life on Earth, the effects of actions and decision relating to resource use..."* (p.30)

Once people are aware of their environment, of the way it works and their dependence on it, surely they will be more willing and prepared to live accordingly. That was also the conviction which *Caring for the Earth: A strategy for a Sustainable Living* (IUCN, UNEP, WWF, 1991) was founded on.

Caring for the Earth was published by IUCN, UNEP, WWF in 1991. This publication is a revised and an updated version of the *World Conservation Strategy* (IUCN, 1980). The *World Conservation Strategy* (IUCN, 1980) discussed how conservation and development can co-exist and what were the merits for mankind and for nature from this co-existence. Its successor, *Our Common Future* (WCED, 1987) discussed and defined the notion of sustainable development. The publication of *Caring for the Earth: A Strategy for Sustainable Living* (IUCN, UNEP, WWF, 1991) extended and emphasised the "*...ethic of sustainable living...*" and it aimed to "*...integrate conservation and development...*".

The core message of the above publication is that conservation of natural resources and human development can co-exist and they should not be in opposition to each other. There are three parts in this publication. The first par describes nine principles which promote sustainable living. Besides, it suggests activities which can transform the theory of these principles into action. These principles as they have been mentioned in the publication are:

"...respect and care for the community of life, improve the quality of human life, conserve the Earth's vitality and diversity, minimize the depletion of non-renewable resources, keep within the Earth's carrying capacity, change personal attitudes and practices, enable communities to care for their own environments, provide a national framework for integrating development and conservation, and forge a global alliance." (IUCN, UNEP, WWF, 1991, p.3)

The sixth principle (change personal attitudes and practices) discusses how people can acquire more positive attitudes and practices towards nature, adopting a sustainable way of living. Such changes are achievable when people obtain the required knowledge and skills, when they have the appropriate incentives and they are persuaded that this is the right thing to do. Formal and non-formal education are the two main channels through which such changes can occur. *Caring for the Earth* has made a link between environmental education and social education suggesting that the former gives an understanding of the natural world while the latter an understanding of human behaviour and cultural diversity. Both environmental and social education should be, according to *Caring for the Earth*:

"...part of all courses at primary and secondary, and many at tertiary level." (IUCN, UNEP, WWF, 1991, p.54)

Apart from the formal education, there should be joint initiatives from governments, non-governmental organisations and media which will promote action plans. The goals of these plans have been defined as to:

"...explain why a sustainable society is essential and to provide all citizens with the values, knowledge, skills and incentives to help them achieve and flourish in it. The plans should promote both the principles of sustainability and the actions that flow from them. They should be implemented through both the educational system and public campaigns." (IUCN, UNEP, WWF, 1991, p.53)

Part two of *Caring for the Earth*, named 'Additional Actions for Sustainable Living', suggests that the management of the environment so far is characterised by sectionalism. That is, environmental issues such as pollution prevention, nature conservation, agriculture, forestry are being dealt with separately. *Caring for the Earth* stresses the need to perceive the environment as an interactive system that:

"...provides the foundation for development and is the ultimate determinant of sustainability and the quality of life." (IUCN, UNEP, WWF, 1991, p.88)

This part of *Caring for the Earth* is comprised of chapters on different environmental topics in relation to human activities and recommended human activities. Six more environmental issues are mentioned: energy; business, industry and commerce; human settlements; farm and range lands; forest lands; fresh waters; and ocean and coastal areas. Its aim is to make clear the linkages among all these issues and how they can have impacts on each other.

Part three of *Caring for the Earth* concluds with more suggestions for action which could help its implementation. Throughout the whole text the clear message is that people, communities and nations need to change if they want to live in harmony with nature. Hence, this third part has suggested actions, which can promote such changes. These actions are concerned with the establishment of local strategies, which take into consideration the particular characteristics of a region. Through such actions the implementation of the proposals contained in *Caring for the Earth* can be a concrete and attainable goal.

The significance of this publication lies in the fact that it discusses conservation and development in terms of sustainable development. It makes clear that sustainable development can help the environment and it suggests ways in which people may achieve just such a sustainable way of living.

In 1992, twenty years after the Stockholm Conference on the Human Environment, a second conference was organised by the United Nations. It was the **United Nations Conference on Environment and Development**, often referred to as the **Earth Summit** in Rio de Janeiro.

This conference was attended by 120 heads of states and governments with delegates from over 170 countries. At the same time a Global Forum, with NGOs and other special interest groups, was taking place in Rio as well, where they were discussing a variety of environmental issues with seminars, workshops and displays.

Major documents were produced at this conference including *Agenda 21:Earth's Action Plan* (IUCN, 1993) which is considered the centrepiece of the Earth Summit, the *Rio Declaration* (UNCED, 1992) and the *Conventions on Climate Change and Biological Diversity* (UNCED, 1992).

Before describing the two most significant documents of the Rio conference, *Agenda 21: Earth's Action Plan* and the *Rio Declaration* a few things will be said about the two Conventions generated in Rio de Janeiro. The *Convention on Climate Change* (UNCED, 1992) discussed management of greenhouse gases in the atmosphere and Palmer (1998) stated that this convention is:

> *"...the first international treaty to acknowledge the threat of global warming;"* (p.20)

The *Convention on Biological Diversity* (UNCED, 1992) discussed ways and means to conserve the variety of living things. McConnell (in Dodds, 1997) claimed that:

> *"The idea was to combine the patchwork of existing international nature conservation agreements dealing with endangered species... migratory species... and so on."* (p.48)

Agenda 21:Earth's Action Plan (IUCN, 1993) is a document produced at the Earth Summit. It is considered to be an Action Blueprint. It discusses major environmental problems/issues that the planet faces today and at the same time it prescribes ways to envisage and overcome these challenges. The issues that it deals with concern population growth, poverty and inequality, food and agriculture, tropical forests, biological diversity, desertification and drought, fresh water, oceans and coasts, energy, atmosphere and climate, hazardous substances and global security. For each one of these issues it makes comments and stresses the importance of governmental policies which need to be established in order to promote sustainable development. For instance, as far as population growth is concerned, it asks countries to establish national sustainable development strategies which will be able to achieve population goals and keep under control the national population carrying-capacity.

Agenda 21:Earth's Action Plan is a voluminous document, consisting of 40 chapters and according to Lindner (in Dodds, 1997):

> *"...it is a comprehensive strategy for global action on sustainable development, dealing with today's problems and trying to set the framework within which the problems of tomorrow can also be addressed."* (p.4)

Its importance and its volume seem even greater when considering that a new agency was established in order to monitor progress on its implementation. This agency was the **Commission on Sustainable Development**. Apart from the aforementioned agency, UNEP is also responsible for monitoring Agenda's 21 implementation.

*Agenda 21*also discusses the importance of education in promoting sustainable development and effective public participation in decision-making. Its role is critical as it can enable people to reflect on environmental and developmental issues. In chapter 36 of *Agenda 21:Earth's Action Plan* (IUCN, 1993) it is claimed that:

> *"Both formal and non-formal education are indispensable to change people's attitudes so that they have the capacity to assess and address their sustainable development concerns."* (IUCN, 1993, p.583)

For the formal sector of education, *Agenda 21*encourages a multi-disciplinary approach for schools and cross-disciplinary courses for universities. At the same time it urges educational and local authorities to organise pre-service and in-service training programmes for teachers, administrators and educational planners, to revise school curricula and to make sure that environmental and developmental issues are implemented and linked together. Schools should encourage local and regional studies for all students when designing environmental activities. NGOs' contributions in raising awareness on environmental issues are also highlighted. Chapter 27 of *Agenda 21* suggests that NGOs:

> *"...possess well-established and diverse experience, expertise and capacity in fields which will be of particular importance to the implementation and review of environmentally sound and socially responsible sustainable development, as envisaged throughout Agenda 21."* (IUCN, 1993, p.513)

The *Rio Declaration* (UNCED, 1992) is another major document signed at the Earth Summit. It consists of 27 principles which reflected and built upon the Declaration of the United Nations Conference on Human Environment in Stockholm, in 1972. These principles describe the rights and responsibilities of nations. Its content is characterised by general instructions which, if followed, can achieve sustainable development. For instance, principles one to four stress the importance of a healthy and productive life in harmony with nature for humans; principles five to seven concern the issue of eradicating poverty as this is viewed as

an '*...indispensable requirement for sustainable development...*'; principles eight to ten report ways of achieving sustainable development such as reducing and eliminating unsustainable patterns of production and consumption; principles eleven to fifteen declare the importance of environmental legislation that all countries should establish and develop; principles sixteen to nineteen require from nations that they take responsibility for their actions, that they bear the cost of pollution when they cause it, that they notify other countries when natural disasters occur, especially when they may have effects on neighbouring states; principles twenty to twenty-three highlight the significance of major groups such as women, youth, indigenous people and their communities; finally, principles twenty-four to twenty-seven discuss the destruction that a war can bring upon the environment and the human society. The principles contained in the *Rio Declaration* aim to promote sustainable development. However, they have more of a recommendatory character which do not oblige nations to implement all of the above. Sands (in Dodds, 1997) made a distinction between rules and principles, claiming that rules are:

> *"...essentially practical and moreover binding..."* (p.88)

while principles are softer because they just:

> *"...assist in the integration and implementation and application, but they do not create substantive obligations that are actionable in their own right."* (p.89)

Hence, the *Rio Declaration* might have had a stronger impact if it was comprised of rules and not only of principles. Certainly the Earth Summit of 1992 was a great event, evidenced also from the sheer number of delegates which participated in it (from more than 150 countries). Moreover, *Agenda 21* included a chapter for promoting education, public awareness and training. With this publication another attempt was made to move environmental education in the direction of education for sustainable development.

In 1993 the European Parliament adopted another *Resolution on environmental education* (EC, Official Journal C20/94, p. 523) with very specific demands such as: to incorporate the environmental dimension into all aspects of education and at all levels, to concentrate their efforts on training programmes aimed at teachers, to define a minimum common content in school syllabuses, to accentuate the

fundamental role of schools and pupils, to devote one week each year to the environment in every school, to help in the establishment of a European network, to integrate regional and local authorities in the development and carrying out of environmental education.

Since 1993 there have not been other events on the same scale as the ones so far presented. Nevertheless, there has been a lot of on-going activity around the world. Hence, in 1997 there was the **Earth Summit +5 Forum**, which took place in Rio de Janeiro. It attempted to evaluate what has happened in the time that has passed since the 1992 Earth Summit. At the conclusion of the Rio +5 Forum, the Earth Charter Commission (formed in 1997) issued the Benchmark Draft Earth Charter. Later, in 1999 after meeting at the UNESCO headquarters in Paris, it issued a final version of the *Earth Charter* (http://www.earthcharter.org/welcome). The Earth Charter is:

> *"...a declaration of interdependence and responsibility and an urgent call to build a global partnership for sustainable development."* (http://www.earthcharter.org/welcome).

The *Earth Charter* was an initiative of the Earth Council and Green Cross International and the final document comprised a preamble, sixteen main principles, various supporting ones and a conclusion. These principles provided a conception of sustainable development and guidelines for achieving it. On the same internet address as above it was reported that:

> *"These principles are drawn from international law, science, philosophy, religion, recent UN Summit meetings, and the international Earth Charter conversation on global ethics."*

Principle 14 of the *Earth Charter* claimed that we should:

> *"a. Provide all, especially children and youth, with educational opportunities that empower them to contribute actively to sustainable development.*
> *b. Promote the contribution of the arts and humanities as well as the sciences in sustainability education."* (http://www.earthcharter.org/draft/charter.htm)

Hence, the *Earth Charter* considered education and especially education for sustainability as a significant factor in changing people's attitudes towards the environment.

The international **Thessaloniki conference** took place in 1997. This was organised by UNESCO and the Greek Government. This conference acknowledged that the recommendations and the action plans that had been produced till then (e.g. *Belgrade Charter* (IUCN, 1975), *The First Intergovernmental Conference on Environmental Education, Final Report* (UNESCO, 1977) for environmental education still stand, yet it also recognised that they haven't been fully developed and implemented. Furthermore, it discussed sustainable development and it stressed the importance of implementing sustainable development in education.

Apart from these initiatives, various conferences have been organised on a national level both in North America and in Europe (e.g. in June 1999 an international conference was organised in Scotland by the Centre for Human Ecology entitled 'For the love of Nature?'; in October 1999 a national conference for environmental education was organised in Athens, Greece, by a Greek NGO). Many countries, notably the United States of America, regularly hold their own major annual meetings on Environmental Education and Education for Sustainability. However, one significant key European event, an international conference, took place in Brussels, in May 1999. This was organised by the European Commission with the theme 'Environmental education and training in Europe'. The objectives of the conference as they were defined in the conference proceedings were to:

- *"put the opportunities offered by EE&T on the agenda of decision-makers within the European Commission and national governments;*
- *exchange information on present and future roles of EE&T in Member States;*
- *discuss in that light the added value of activities at European level;*
- *explore new challenges for the role of the Commission;*
- *stimulate networking and informal contacts among experts from the Commission and Member States."* (European Commission, 1999, p. 13)

1.1 Conclusions – Emerging trends in Environmental Education 1970s-2000

During the 1970s environmental education was primarily focused on environmental problems and on nature, whilst the great achievement of the events developed in the 1980s and in 1990s concerned the introduction of sustainable development as an important feature of environmental education. Thus, an important shift from environmental education to education for sustainable development seemed to emerge. Education for sustainable development has considered the social, economic and political dimensions of environmental issues. These dimensions were also included in the principles of environmental education referenced in the major events during the previous three decades. However, its focus was mostly on education about nature, whereas education for sustainable development has emphasised the tight bonds between the environment and economy, between the environment and society. That shift could be attributed to the serious environmental accidents which occurred and to major environmental issues that surfaced during the 1980s and the 1990s. Hence, education for sustainable development became to be seen as an imperative need if the environment is to be protected. Nevertheless, the documents which have introduced and promoted education for sustainable development (e.g. *Agenda 21*, *Caring for the Earth*, etc.) do not seem to give clear instructions on how this can be achieved in school classrooms. Education for sustainable development became the hallmark of education for the 21st century but it entails value-laden issues which can be difficult for teachers and their pupils to investigate. In other words, education for sustainable development does not seem to comply, still, with the already existing school curriculum which promote unsustainable models of development.

Apart from the development and ultimate metamorphosis of the actual term 'environmental education', all the major events and publications that were produced between 1970 and 2000 contributed significantly to the dissemination of environmental education. Firstly, education was acknowledged as a key element in changing peoples' attitudes towards the environment. Then, the meeting in Nevada in 1970 and *Agenda 21* claimed that environmental education should be a component of the formal educational system. The Tbilisi conference of 1977, the Nevada meeting of 1970 and the *European Resolution of May 1988* (CEC, Journal of European Communities, 6/7/88) emphasised the need for pre- and in-service teacher education programmes for environmental education.

Summarising what has been reported so far, it is possible to claim that the period since the 1970s has witnessed an attempt to move away from the previously held world view concerning the relationship between man and nature. According to this dominant view nature is supposed to be subservient to human desires and needs. Based on this view economic and technological progress does not take into account the consequences they inflict upon the environment and its natural resources. The shift that these meetings and publications attempted to exert concerned exactly this irresponsibility that humans exhibited towards nature in the name of their own species' progress. Through it, development and conservation of nature were presented as two terms that need not be contradictory. Development and conservation can co-exist and such co-existence can lead to sustainable living. This shift, to a view which is considerate both to humans' needs and to the needs of other living organisms on earth, constitutes a new ethic. Formal education was acknowledged as one important way to achieve this new ethic.

That said, important questions arose from the previously described events of this period concerning the kind of needs that developed and developing countries face. Both categories of countries (developed and developing ones) have environmental problems, but the alleviation of these problems, their solution and their progress towards a better quality of life have to be dealt with separately in different countries, especially in countries with different social, economic and political structures. General policies and strategies for sustainable development have been described by the aforementioned events, but the question is whether these policies are applicable to all countries, and if not how they can become so.

The next chapter describes different typologies of environmentalism, focusing on ecocentrism and technocentrism as the most dominant opposite ideologies and goes on to investigate how these ideologies have influenced environmental education and its characteristics.

2. ENVIRONMENTALISM: ECOCENTRISM AND TECHNOCENTRISM.

Education for the environment is one of the many different aspects (e.g. environmental economics, environmental geography, etc.) which exhibit a concern on behalf of the environment. As was described in the previous chapter, it is only relatively recently that such a way of thinking about the environment has come to the fore. No matter how simple the term 'environment' may seem to be, there are various ways by which people perceive it and each of these ways express different economic, different political, different educational ideas about the environment. Environmentalism is a term which connotes the existence of all these various ways – otherwise known as environmental ideologies- which people use to make sense of the environment. Thus, environmentalism and its ideologies stem from the various angles from which people view the environment. Pepper (1996) claimed that:

> *"There are typologies which fasten on attitudes to nature, those which distinguish between different approaches to knowledge about it..., political ideology typologies..., different philosophical approaches to nature..., and those which mix these approaches."* (p. 34).

The best known distinctions are those of ecocentrism and technocentrism. Both these typologies contain subdivisions with different interpretations of ecocentrism and technocentrism. These subdivisions may overlap with each other in each typology.

2.1 Ecocentrism.

Ecocentrism is a compound word. The first part of the word, 'eco', comes from the Greek word, 'oikos', meaning house. The second part, 'centrism', denotes the centre, the focus. Hence, literally speaking, ecocentrism defines nature as the 'house' or primary place which humans belong to. As such, humankind is only a part of the whole ecosystem and should abide by the laws imposed by nature. Nature is able to sustain itself, but humans need nature to sustain them. Humans must take great care over the manner with which they exploit natural resources in order to satisfy their needs. A significant aspect of this typology is the notion of 'bioethic' (Pepper, 1996)

which emphasises the intrinsic value of nature. That is, nature should not be appreciated according to the degree of satisfaction it gives to human needs and desires. Rather, people should accept and respect other living organisms, such as plants, animals and other humans, regardless of their perceived value. Ecocentrism does not regard humans and nature as two different things. They are one or, even better, humankind is a subtotal, a part of the natural environment. That is why humans should try to live according to the ecological laws. To go against these laws can result only in all manner of destruction. Ecocentrism denies this dualistic view of man and nature as two different things and favours monism. Monism (Bramwell, 1989) claims that everything and everyone in the universe consists of one basic entity and the different organisms of nature represent just another form of this entity. It favours a diversity of life because this diversity brings balance to ecosystems. Especially where this extends to human attitudes -the idea of multiple and diverse points of view- consensus and harmony can be achieved in society and nature.

One of ecocentrism's two general divisions is that of Gaianism (O'Riordan, 1988), where people express faith mostly in the rights of nature and see humankind evolving and progressing within nature. Gaia (Lovelock, 1972) and Gaianism are very much related to bioethics. They also endorse the idea of the Earth as a self sustained, self-regulating organism.

The other general division of ecocentrism is that of Communalism (O'Riordan, 1988)). In Communalism, apart from believing in the rights of nature, there is a strong faith in the cooperative capabilities of society. Its vision is to create self-reliant communities where 'soft' technology will be used based on renewable resource use. 'Soft' technology or 'alternative' technology is that technology which is environmentally benign and potentially democratic in the sense that, since it will not involve great economic and political power, many individuals and groups can have access to it.

Before examining other divisions of ecocentric typology, an historical and ideological background of ecocentrism is given.

2.1.1 An historical background of Ecocentrism

One very important ecological thinker is Thomas Malthus. In his work, *Essay on the Principle of Population* (Malthus, 1872) at the end of the eighteenth century, he suggested that the population rate grows much faster than the food rate needed to support this population. He wrote that the population increases in a geometrical ratio and the food in an arithmetical one. Hence, it is time that humankind started to respect that the Earth cannot tolerate unlimited population growth and that such growth will lead to an exhaustive exploitation of natural resources.

Romanticism nourished ecocentrism's ideas as well. This movement of the eighteenth century protested against the miserable conditions under which most city people lived. It was a reaction to the rapid pace of the industrial revolution and development which was spoiling nature and degrading the quality of life. Romantics believed in the unspoilt beauty of nature, where individuals lived in harmony, away from the corrupting influence of the city (Pepper, 1996). Romantics also felt that qualities such as colour and beauty were not subjective and therefore 'secondary', but were inherent. Hence, the quality of nature possessed an intrinsic value outside the sphere of the purely human comprehension. This intrinsic value constitutes a key aspect in the bioethic of modern ecocentrism (Pepper, 1996). For this reason Romantics believed that nature could not and, most importantly, should not be improved upon through science and technology, concentrating, as they do, on materialistic changes and not taking into account the values of the heart and spirit. Intuition, instinct and emotion have no place in science and technology. Therefore, since these qualities are not regarded as important, it is inevitable that scientific progress will do more harm than help to humankind. These romantic notions of intuition, instinct and emotion can be associated with the spiritual ecology (Merchant, 1992), which seeks new ways for humans to relate to the environment. Spiritual ecology focuses on human consciousness, and more particularly, as Merchant (1992) reported:

> *"...recognising the importance of some form of religious experience or worship in the lives of most people, spiritual ecologists attempt to develop new ways of relating to the planet that entail not an ethic of domination, but one of partnership with nature."* (p.112)

Later on, in the nineteenth century, Darwin demonstrated the similarities between Homo sapiens and apes. Humans were one of many species on Earth and were also related to other species of the universe. In his work, *On the Origin of species* (Darwin, 1885) he succeeded in describing the dependency of one organic being on another, showing at the same time the complexity of relationships in nature. Pepper (1996) wrote that:

> *"...nature was 'one grand scheme' of cooperative integration, in which the most insignificant beings are important. Darwin's 'biocentric view' saw a brotherhood of creatures in a 'community of descent' from ultimately common origins."* (p. 183, 184)

In this sense Darwin can be considered as one of the people who influenced ecocentrism's ideas and beliefs.

Furthermore, utopian socialism has its roots in the pre-industrial era when, according to Pepper (1996):

> *"...millenarian peasants, artisans and intellectuals from medieval times to the Civil War...wanted an egalitarian communalist society."* (p.205)

The egalitarian communalist society is the ideal society where the idea of community prevails. In such a society, there are no landowners taking advantage of others and of the land. In the nineteenth century, utopian socialism focused again on egalitarianism and common ownership of the means of production. Its aim was to limit power to small-scale communities. Saint-Simon (in Manuel, F.E. and Manuel, F. P. 1979) is one utopian socialist who believed in these small-scale communities where there would be no class conflicts and where people would be able to act and live entirely in accordance with nature. Hence, individuals would not be unhappy or miserable as they would be allowed to be truly themselves. Another utopian socialist, Fourier (in Roelofs, 1993), also talked about ideal communities of up to 1700 people while Owen (in Goodwin and Taylor, 1982) suggested that human behaviour is influenced by the environment in which they live and proposed self-sustaining communities without private property. Furthermore, Morris (Morris, 1887a) acknowledged the fact that humans can have a positive impact on nature as

long as that contact is not aggressive as it is in capitalism. Utopian socialism favoured egalitarianism and decentralisation of power and opposed centralism and capitalism.

Ecocentrism and utopian socialism are related as they both give priority to nature, they both try to balance the spiritual with the material world and they are both in favour of a 'soft' technology - technology which will not cause any damage to nature. Instead, it will improve both nature and human life.

It could be argued that the utopian socialism movement initiated the socially critical approaches to the environment which attribute all environmental problems to the unequal distribution of resources and to the principal dominance of economic policies.

In the twentieth century, Haeckel (Haeckel, 1866) defined ecology as the study of the environment's living organisms in relation to their habitat and other species. He argued that humans are only one species among many others (Bramwell, 1989). He also believed in the idea of monism where the universe consists of one entity - being either all mind or all material- but being all one (Bramwell, 1989). He, therefore, denied the dualism of human - nature whereby humans and nature are viewed as two different things. Pepper (1996) stated that:

> *"...an individual could belong to something greater than him- or herself. That is, people had a mystical unity with others and with the whole of the cosmos."* (p.186)

It is apparent that Haeckel believed in a system of nature's dynamic equilibrium in which humans, animals and plants are entitled to the same rights in life. No human should be above nature or above other organisms (Bramwell, 1989).

In the twentieth century, ecocentrism continues to view nature as a self-sustained organism that can survive with or without humans. It may even fare better without humans since they over exploit its natural resources. One of the central tenets of green theory today asks society to overcome the separation of 'human' from 'nature' and the idea that humans are superior to nature (Barry, 1999). Pepper (1996) claimed that after the Second World War naturalists' concerns were taken under serious consideration by politicians. It is believed that the environment itself,

defined in physical terms such as climate, water, soil, relief, is capable of determining human development (Peet, 1985). Human actions are controlled by environmental factors which dictate the limits within which people can act. When humankind goes beyond these limits, then the balance between man and nature is destroyed. That is why ecocentrism believes in environmental determinism. Every disaster on this Earth has been caused mainly by wrong thinking which suggests that if something is good then more of it will be even better. The notion of environmental determinism is also closely related to the ecological law of carrying capacity. According to this law, the Earth sets limits on economic, technological and population growth. Hence, by exceeding these limits, humankind is led to an inconsiderate mode of natural resource exploitation.

2.1.2 Ecocentric political approaches

Within ecocentrism there are also different interpretations of environmentalism based on various political approaches. Deep ecology, Social ecology and New Age tendencies are three ideologies which share common characteristics concerning the environment but, also, have certain particular elements which distinguish them from each other.

Deep ecology, closely related to the main ideas of ecocentrism, such as Gaianism and monism, endorses nature and at the same time places great importance upon transforming the society, focusing on the individual consciousness. The term 'deep ecology' is attributed to a Norwegian philosopher, Arne Naess. Naess (Naess, 1973) talked about 'self-realization' and 'biocentric equality'. 'Self-realization' is concerned with questioning deeper and deeper the living and non-living world around us in order for humans to gain an identification which is beyond the technocratic-industrial society and the isolated from nature human ego. 'Biocentric equality' regards the world as a place where all things in the biosphere have equal rights to live. Naess claimed that:

> *"The essence of deep ecology is to ask deeper questions"* (Naess, 1982 cited in Devall and Sessions, 1985, p.74)

and

> *"There is a basic intuition in deep ecology that we have no right to destroy other living beings without sufficient reason..., human beings will experience joy when other life forms will experience joy and sorrow when other life forms will experience sorrow."* (Naess, 1982, cited in Devall and Sessions, 1985, p. 75)

Hence, deep ecology claims that society can change provided that individuals change their attitudes, their values and their lifestyles concerning their respect for nature and the way in which man cooperates with it. People should try to fight the false needs that the technocratic society creates by acquiring a deep ecological consciousness. Individuals are the motor of social change and when all individuals follow the slogan "the personal is political", then all society will change. This change will be attributed to the fact that people will understand that all their actions have political ramifications influencing themselves, the society they are in and the natural environment they belong to. Deep ecology views this social change as urgent because the present situation, that of excessive human interference and dominance in nature (Devall and Sessions, 1985), is worsening. However, deep ecology has been accused of being politically naive as it places so much significance on the power of the individual to change the society and, consequently, to change its economic and technological structures (Pepper, 1996).

Social ecology attributes ecological problems to social, hierarchical, authoritarian structures (Zimmerman, 1994). Its vision is to create an anarchist-communist society where domination and hierarchy will be eliminated. Equality and freedom will replace them, hence, there will be no social injustice and the society will acquire a democratic and communal character based on decentralised, regional autonomy (Bookchin, 1981). The anarchist-communist society is that which rejects any kind of authority or government, since it sees this as a source of social troubles (Bookchin, 1990). It favours social and economic relations which nurture feelings of belonging, of sharing, of caring, of cooperating and of surviving. Social ecology tries to keep a balance between man and nature. It does not overemphasise either nature's superiority over human activities, like deep ecology, or human's power over nature. It attempts to situate humankind's good along with earth's good. It differs

from deep ecology in the sense that it gives priority to humans by claiming that once there is social justice, that is, when all humans have the same rights, then nature's rights will also be protected. It is not believed possible, however, to invert this process -that is to protect the rights of humans by initially protecting those of nature. Merchant (1992) claimed that the difference between social ecology and deep ecology is rooted in the fact that the former places the problem in the dialectic between society and ecology while the latter between the ecological and mechanistical worldviews.

The New Age is another political approach that humans use to view nature (Capra, 1982). The world is an interdependent whole and actions in one part can affect the whole (Capra, 1982). Pepper (1996) said that:

> *"...[The] 'New Age' sentiment saw the cosmos as a living soul, imbued with spirit, where humans were a microcosm of the larger order."* (p.125)

Its idealistic character allies its ideas to those of deep ecology (Pepper, 1996). Earth comprises humanity and nature. It is one integrated system where each component's actions affect the others and the whole. It places great importance on consciousness, and more specifically, on global consciousness as it believes that changes in consciousness can contribute to massive changes in people's behaviour and attitudes. Each individual should attempt to foster a close and harmonious relationship with the planet in order to derive a sense of being at one with nature and earth. Hence, there are no problems in nature. It is humans who have problems because they do not know how to behave towards nature and how to cooperate with it. The moment they reach self-realisation, they will be in tune with nature. New Age, like deep ecology, can be criticised for placing too much responsibility on individual action and thought and for not taking into consideration economic and social class divisions that exist already in the society in which humans live (Elkins, 1989/90).

2.1.3 Ecocentric economic approaches.

Finally, another way of viewing nature is through economic systems and beliefs (Pepper, 1996). This is particularly relevant in the twentieth century which is defined

by an attempt to unite ecology and economics. That this attempt succeeds is of immediate concern to the world's population, facing the danger of finite resources and the resultant growth limits and scarcity risks. Commoner (1972) recognised the private enterprise system as the cause of environmental pollution because it replaced old productive techniques with new, more profitable technologies. He also attributed the costs of environmental degradation to society as a whole which subsidizes the enterprises. Economics is closely related to ecology and it is dependent on natural resources since their exploitation provides products and services to be sold (Turner, Pearce and Bateman, 1994). The carrying capacity of the environment suggests, or at least it should suggest, the relation between production and nature. The fundamental premise of green economics is that the resources of the natural environment will not be able to meet increasing human demand indefinitely (Hueting, 1992). Therefore, people need to make choices concerning the importance of the functions and goods that the environment provides so as to prioritise them. Green economists (Pearce, 1992) claim that nature's over exploitation derives from a corrupt political and economic system where commercialists create artificial needs (Pepper, 1996). Actually, Greens make a distinction between the real needs humans have and those artificial needs, which they term wants (Ekins, 1992a). Human needs can be satisfied by nature but human wants place bigger demands on nature which are not always possible to satisfy. Nature has a value in itself, and not an exchange, labour or social utility value as defined by Capitalism, Marxism and Socialism respectively (Pepper, 1996).

Within ecocentrism exist the divisions of Gaianism and Communalism (O'Riordan, 1988), both differing slightly in their economic approach. The Gaianists support a very deep green economy which aims to minimize the 'resource-take' (Turner, Pearce and Bateman, 1994). The Communalists support a deep green economy which is regulated by macroenvironmental standards (Turner, Pearce and Bateman, 1994). Generally speaking, green economics aim to promote ecological sustainability and economic development in terms of satisfying human vital needs for all people (Ekins, 1992a).

2.2 Technocentrism.

Technocentrism is the second typology of environmentalism which actually sets out the dominant attitudes towards nature in modern Western society. Literally speaking, technocentrism places the focus on technology. Classical science, technology and conventional economics prevail in technocentrism's thinking and action. Nature is conceived as machine-like, separate from humans. It can be examined, controlled and measured by being broken down into its component parts.

2.2.1 An historical background of Technocentrism

The historical and ideological roots of technocentrism go back to medieval cosmology and to the scientific revolution. In medieval cosmology there were two zones, the celestial and the terrestrial. The celestial zone was said to be perfect, where the stars, the planets, the sun and the moon moved in circular orbit and behaved predictably. In the terrestrial zone things were not perfect. Their motion was random, taking any direction and they were subject to change. The centre of the universe was Earth and outside the celestial zone there was nothing, it was non ens. Evidence suggested the Earth to be solid, spherical, stationery and finite. It comprised four basic elements: earth, air, fire and water. The celestial zone, the perfect one, was made up of a similarly perfect element, the 'quintessence'. Central to medieval cosmology is the teleological view. According to this, there is a final cause behind everything. Thus, all imperfect, terrestrial objects behaved in accordance with God's desire since God was the final cause (Pepper, 1996). Furthermore, as nature was God's design, it meant that people could 'read' nature in order to find more instructions to help them fulfil God's desire. Despite the importance of God, medieval cosmology was also anthropocentric and animistic. Human notions and categories were used to describe the celestial and terrestrial zones. Analogies were drawn between the Earth's basic elements and humans (Gold, 1984). For example, rivers were associated with the circulation of blood in human organisms or the air was breath. Such metaphors gave a sense of vitalism to everything. This organic view of nature meant that everything around has life and tries to fulfil God's purpose (Pepper, 1996). In this way, soul was attributed to plants, to animals and to all other inanimate objects. There was a chain of living

things named the Chain of Being (Oldroyd, 1980). Even the smallest part of this chain was vital to the existence of the whole. Man was situated in the middle of this chain. Above him was situated the intelligence of angels and beneath him were animals and plants. At the top of this Chain was, of course, the first principle, God (Oldroyd, 1980). So, in medieval cosmology, Earth was a divine living organism where everything and everyone were linked together in a material, mystical and spiritual way. This linkage had its own hierarchy beginning with God and angels, descending to man, and finally to plants, to animals and to insects.

After medievalism, scientists (e.g. Copernicus, Newton, Kepler, Galileo, Descartes, Bacon) were still trying to explain the cosmos and its physical movements by focusing on the interrelatedness of objects and their existence, or, in other words, investigating the law of cause and effect (Whitehead, 1926). By now, however, it was no longer necessary to attribute all final causes to the will of God. Problems were being tackled with universal spatial principles which attempted to provide explanations not through mystical and spiritual procedures but through science based on plausible proof (Pepper, 1996).

Kepler (letter to Herwart von Hohenburg, 1605, cited in Holton, 1956), in his attempt to explain planetary motion, described how the sun and the planets functioned as magnets. The sun is pushing the planets around it. He saw nature as a clockwork and not as a divine organism. This metaphor of nature as a clockwork organism evokes a system with structures following certain rules which can explain and predict its actions. Therefore, cosmology is deterministic since past actions determine the present and the present determines future goals. Kepler believed he could understand nature, and through it God's intentions, using mathematics and geometry (Kepler, *Harmonici Mundi,* 1619, cited in Koestler, 1964).

In the same way, Galileo Galilei (in Pepper, 1996) thought that God had created the universe according to mathematical principles. In order to explain nature he needed to resort to mathematics in conjunction with observation and experimentation. Nature is a machine but when people look at it, they do not realise this unless it is broken down into its components. From this point, components may be observed, experimented with and measured. Whatever cannot be measured is not true. This conviction has its origins in the distinction that Galileo Galilei drew

between primary and secondary qualities (Galileo, *The Assayer*, 1632, cited in Pepper, 1996). Primary qualities such as size, weight, length, motion and shape constitute objective knowledge which can be seen and can be measured. Secondary qualities such as smell, taste and colour constitute subjective knowledge which may differ from one individual to another and cannot be seen or measured. Hence, secondary qualities are not 'true' knowledge. This distinction between what is objectively and what is subjectively real led to a fundamental distinction between society and nature.

Descartes also endorsed the idea of nature as machine-like. Dobson (1991) said that:

> *"Descartes insisted that even the organic world (plants, animals etc.) was merely an extension of the general mechanical nature of the universe;"* (p.38)

Mathematics was the only way to reach truth. For him (Descartes) matter was infinitely divisible. By dividing matter into its smaller parts, everything could be examined and quantified (Descartes, *Discourse on Method,* 1637, cited in Pepper, 1996). Thus classical science, like mechanistic science was also reductive. What distinguished man from the rest of nature was his thought process. Mind and matter constituted man. Mind cannot be separated into its components and since it attributes secondary qualities to nature, is subjective, hence not true. Matter, on the other hand, can be divided into its components which are measurable, it attributes primary qualities to nature, hence it is true. This Cartesian dualism of mind and matter, as mentioned above, had an impact on the society-nature relationship.

Bacon (Bacon, *De Sapientiae Veterum*, cited in Pepper, 1996) believed that by starting to make observations of nature, by experimenting and by collecting data, the truth could be obtained. In this way, initial hypotheses could be formed and verified. Having been verified, these hypotheses gain the status of laws of nature. Merchant (1980) said that:

> *"Bacon's scientist not only looked but behaved like a priest who had the power of absolving all human misery through science."* (p.181)

Hence, science was progressive both because it was leading people to truth and because it was ameliorating peoples' material circumstances. Science served the universal good and became equated with human progress. Consequently, since science was seen to advance the cause of mankind, human and scientific power over nature was deemed acceptable.

The mode of production and the man-nature relationship define the way people behave towards nature. Peoples' needs are also redefined based on the available resources to fill them. Consequently, new ecological problems are created and demand new solutions. For instance, in the time of primitive communal societies where there was common land ownership and the distribution of goods was based on peoples' real needs, man did not exercise power over nature in a destructive way. When such societies were replaced by societies where making profit out of production instead of satisfying primary needs became their first aim, then the man-nature and society-nature relationships changed. With the growth of capitalism, whose principal interest is the accumulation of capital for those who own the production means, this is precisely what happened. Pepper (1996) claimed that:

> *"...the ideology of power over nature (the Baconean creed) may not reflect the interests of all, as Bacon envisaged, but instead may serve the material vested interests of elite minorities."* (p.160)

Therefore, social, economic and political changes signify changes in the society-nature relationship as well.

The Cornucopians and the Accommodators (O'Riordan 1989) are the two general divisions of technocentrism. These different approaches to nature lead to different political and economic systems which will be shortly examined.

2.2.2 Technocentric political approaches.

In contrast with ecocentrism's deep ecology, technocentrism is characterised by shallow ecology. Shallow ecology, thus, views man and nature as two different, separate things and acknowledges human domination of nature. The idea of domination derives from its anthropocentric characteristic, according to which humans define values in terms of usefulness. Consequently, in the name of human

needs and desires, man has the right to manipulate and exploit nature as best suits him. O'Riordan (1981) claimed that:

> *"The technocentric mode is identified by rationality, the 'objective' appraisal of means to achieve given goals, by managerial efficiency..., [and] control physical, biological and social processes for the benefit of present and future generations."* (p.11)

Cornucopians and Accommodators are the two general divisions in technocentrism (O'Riordan, 1989). They both acknowledge that there are environmental problems but the former division (Cornucopians) places absolute faith in the present form of society. Cornucopians believe that no matter what the problems or difficulties are, society along with technology will find solutions and problems will cease to exist. The Accommodators, on the other hand, suggest that problems can be solved only through more careful economic and environmental management. Whilst recognising the need for some change, accommodator technocentrics, unlike ecocentrists, do not advocate a radical alteration of social, economic and political structures.

Cornucopians believe that all environmental problems will find a solution within the current society. There is faith in authority, in government and in institutions to estimate and satisfy the needs of the environment. Science, technology and the free market will advance society and nature. Accommodator technocentrics also believe in science, in technology and in the state as ways to progress and evaluate environmental demands. At the same time, though, they realise that economic and environmental management is needed in order to achieve this goal. Society is not always able to deal with all environmental problems without careful planning beforehand (Pearce et al, 1989).

2.2.3 Technocentric economic approaches.

Cornucopians support the economic theory of subjective preference, according to which the value of things stems from the attempts of individuals to maximise their personal interests and welfare (Corbridge, 1993). They argue against government intervention, preferring as much freedom as possible in order to exercise their consumption and production choices. The market is responsible for reconciling the

interests of individuals with those of a society regarded as the sum of the individuals comprising it.

Accommodators favour the cost of production economic theory. This theory claims that it is the cost of production and not the consumers' subjective preference that determines what is produced and its value. In capitalism, the cost of labour constitutes a major part of the cost of production. Hence, the level of mechanisation and the division of labour influence immensely the production, the profit, the wages and the unemployment rate (Goodin, 1992).

2.3 Other distinctions of environmentalism

In addition to ecocentrism and technocentrism, there are also the distinctions of egocentrism and of homocentrism (Merchant, 1992). These two divisions, namely egocentrism and homocentrism, are close to the divisions of Cornucopians and Accommodators respectively. Egocentrics also take a mechanical view of nature whereby its functions can be controlled and manipulated. Egocentrism is grounded in the self. What is good for the individual will benefit society as well. Merchant (1992) referred to egocentrism as the ethic which allows individuals to use natural resources in order to ameliorate, primarily, their own lives and then society. This is in contrast with ecocentrism whose basic ideas have already been demonstrated. Homocentrism lies somewhere in between Accommodators and Cornucopians (Pepper, 1996, Merchant, 1992). Homocentrism is close to accommodatory technocentrism in the sense that it views nature both as machine-like and as an organism. It seeks social justice and it prioritises human needs and values, but not in the same manner as the egocentric or cornucopian technocentrics. Homocentrism upholds that all organisms on Earth have rights and seeks to compromise human needs with environmental demands. Such a compromise, provided it is accomplished respecting nature's functions, can surely lead to human happiness and welfare. Homocentrism is grounded in the social good. It gives priority to human species as it permits humans to manage nature for their benefit (Merchant, 1992).

2.4 Environmentalism and its effects on Environmental Education.

Ecocentrism and technocentrism are two different ideologies of environmentalism. Each one supports a distinct way of thinking about nature, of considering problems and its roots relating to nature and of finding ways of dealing with these problems. These typologies then express certain life choices according to which people run their lives. That is, both ecocentrism and technocentrism contain beliefs, values and set of attitudes which provide people with ideas of what the world looks like or what it should look like. Hence, ecocentrism and technocentrism can shape people's perceptions of social, economic and educational systems. The influence that ecocentrism and technocentrism have on the social and economic systems has been presented earlier in this chapter. The influence that they (ecocentrism and technocentrism) can exercise on educational systems can be seen through three different educational orientations; the vocational/neoclassical orientation, the liberal/progressive one and the socially critical orientation.

The vocational/neoclassical orientation aspires to equip pupils with the appropriate skills and knowledge to fulfil their future work roles. The liberal/progressive orientation seeks:

> *"...the development and improvement of society through the education of autonomous individuals...It recognises the need to address social problems and adopts a reformist approach..."* (Fien, 1993, p.22)

The socially critical orientation seeks to create just and democratic societies developing pupils' critical reflection and action in society.

These educational orientations have similarities with either the technocentric or the ecocentric typology. For instance, the vocational/neoclassical orientation pertains more to technocentrism as it favours the continuation of the present social, political and economic systems. The liberal/progressive orientation is more akin to the accommodator technocentrics who adopt reformist policies toward economic and social problems. Finally, the socially critical orientation is closer to ecocentrism as it discusses changes in society through critical reflection and action (Fien, 1993).

Environmental education can be seen as a strategy aiming to promote such a social change which can involve people in active participation towards just and

democratic societies. However, as environmental education is categorised in education ABOUT the environment, in education THROUGH the environment and in education FOR the environment, it is possible to discern further influences of ecocentrism and technocentrism upon these three categories of environmental education. Thus, one could argue that education ABOUT the environment pertains to the Cornucopian technocentric typology (Fien, 1993). It is concentrated on teaching facts about environmental processes, hence a better understanding of environmental problems can be achieved (Huckle, 1983a). Education THROUGH the environment could be claimed to be akin to the Communalist ecocentric typology (Fien, 1993), which uses the environment as a medium for education, hence the environment is conceived as a:

"...*rationale and a vehicle for children's development*" (Fien, 1993, p.42)

Finally, education FOR the environment pertains to the Gaianist ecocentric ideology (Fien, 1993). Its focus lies on developing environmental awareness which will lead to informed and active people participating in decision making and problem solving. It is clear that environmental education contains both ecocentric and technocentric characteristics. The first significant definition of environmental education that was formulated in Nevada in 1972 discussed environmental education in terms of knowledge, of values, of skills, of attitudes and of decision-making. All these elements were described earlier as part of the three categories of environmental education (ABOUT, THROUGH and FOR the environment) which express ecocentric or technocentric approaches. In the same spirit are also the descriptions of environmental education in later publications. Hence, one could argue that there is some sort of balance between the technocentric and the ecocentric elements that define environmental education.

However, the dominant ideology in society is the technocentric one. Our society is characterised as technocratic and industrial. The people who live in such a society are isolated from nature, from themselves and from each other. They consider mankind superior to all other species on Earth and that is why they explore and over-exploit nature's vital resources. The technocentric ideology firmly believes

that its knowledge and progressive advancements can solve whatever environmental problems come along.

The majority of environmental problems, presented as soil erosion, deforestation, poverty, population growth, air/water pollution and climatic changes have put a strain on politics and policies, on economy, on society and on education as well. The severity of human impact on the environment has started to make itself apparent and threatening. Hicks (1996) discovered that:

> *"Young people see life in their local community as problematic, citing traffic, amenities, crime and the environment as issues that worry them. At the global scale, they most fear war in the future, followed by environmental damage and issues to do with poverty and starvation."* (p.104)

Since the 1960s people have started developing an awareness of environmental issues which affect themselves and their lives in a direct or in an indirect way. Fien (1995) suggested that:

> *"...[people] are becoming increasingly aware of the links that exist between human development and the environment. Instead of seeing the environment as nature and natural systems alone..., [people see] the environment as a complex web of global social, cultural, economic and political as well as geo- and bio-physical components."* (p.22)

Major international reports such as the *Our Common Future* (WCED, 1987), the *Caring for the Earth: a strategy for sustainable living* (IUCN, 1991) and *Agenda 21:Eart's Action Plan* (IUCN, 1992) of the Earth Summit in Rio, discussed the notion of 'sustainable development'.

Sustainable development is the kind of development which takes into consideration the social, political and economical ramifications that human developments bear upon the environment. In Tilbury (1995) sustainable development is described as a process which will bring economic development in accordance with environmental conservation, that will consequently lead to a combined concern for environment and development. Hence, mankind will encourage technical progress but at the same time it will contemplate an economic, a political and a social growth that is in favour of the environment they live in. The

definition that *Our Common Future* (WCED, 1987) has ascribed to sustainable development claimed that:

> *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* (WCED, 1987, p.43)

From the above it can be deduced that the environmental problems the world faces today have resulted from environmentally ineffective economic, political and social policies. If this is so, then a serious issue arises as to how these policies can be changed.

It is very difficult, indeed some would argue impossible to fight against such policies which have been determined for so many years and have been emerged from such powerful interests. This task becomes harder, especially when people do not know what is they are fighting for. That is, they may understand what is they should fight against, but people find it difficult to have a vision of what a better world should really look like. One of the most prominent and promising ways to enable people to visualize better societies and help them realize the means for achieving them, is education. And that is a very important goal of environmental education as well. According to the 1988 European Resolution environmental education aimed at:

> *"...[increasing] the public awareness of the problems in this field, as well as possible solutions and 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."* (CEC, Official Journal of the European Community, 6.7.88)

Tilbury (1995) suggested that in the 1990s there should be a broader focus to environmental education where it would not be restricted only to immediate environmental improvements but would include development education. She claimed that:

> *"...environmental education in the coming decade must re-orientate itself towards improving the quality of life of all citizens under the focus of EEFS. [Environmental education for sustainability]* (p.197)

Environmental education for sustainability aspires to teach pupils the interconnectedness of all living and non-living things on the planet. Environment is regarded as the totality of surroundings where aesthetic, social, political, historical, economic, cultural, physical and biological elements are all included in the study of environmental issues. This holistic approach, therefore, will contribute to the acquisition as Tilbury (1995) suggested:

> *"...[of an] environmental ethic [which] highlights the importance of valuing the interrelatedness of the web of life and promotes the principal value of concern for all life forms."*(p.201)

One could argue that education for sustainability is trying actually to compromise educational ideas emerging from the ecocentric and technocentric ideologies. On the one hand, there is education ABOUT the environment which provides pupils with solid and objective knowledge about nature and environmental issues. On the other hand, education for sustainability dictates a different way of viewing environmental issues. This way has to be holistic and it has to consider all different angles of an environmental issue, namely physical, social, political and economic. Thus, objective knowledge ceases to be absolutely objective because, in the light of different viewpoints, different perspectives appear as well. However, the question brings into sharp focus the existent school curricula and whether such curricula promote ecocentric or technocentric features. Fien (1995) argued that:

> *"Much of the dominant discourse in environmental education, even some of the prescriptions for environmental education objectives, content and teaching methods... have been based upon a technocentric approach to environmentalism which favours initiating young people into the concepts and skills needed for finding scientific and technological solutions to environmental problems without addressing their root social, political and economic causes."*(p.27)

This chapter has discussed different ideologies of environmentalism and has showed how they have influenced economic, political and educational approaches. Even though environmental education is supposed to permeate all school subjects, the focus on education ABOUT knowledge restricts teachers from examining environmental issues holistically. More specifically their over-arching themes are

not addressed as much as the actual fact-knowledge about these issues *per se*. Chapter 3 will discuss a global response to environmental education and it will detail the status of environmental education in England and in Greece. The first section will discuss how major documents and publications produced in the 1970s and in the 1980s (see chapter 1) have influenced the policies that various countries have taken for environmental education. After this is done, a more detailed account will be given for the national curricula of England and Greece.

3.GLOBAL RESPONSE TO ENVIRONMENTAL EDUCATION AND PRESENT DAY STATUS OF ENVIRONMENTAL EDUCATION IN ENGLAND AND IN GREECE.

Preamble

This chapter briefly indicates how various countries in the world integrated environmental education in their educational systems. It attempts to locate a time period when they actually started taking environmental education into consideration and how this consideration is manifested. Then, the status of environmental education in England and in Greece which also constitute part of this global overview, is presented in greater detail.

3.1 Global response to environmental education.

The majority of initiatives in the field of environmental education started to develop after the significant international conferences held during the 1970s. Only relatively recently, in fact since the late 1980s, has there been a world-wide effort to establish institutions and publish acts dealing with environmental education. Even though the first definition of the term was formed in 1970 (Nevada, USA) the formal education sector in many countries started systematically to include environmental education in their curricula only during the 1990s. For instance, the USA legislated for a new National Environmental Education Act in 1990 (Disinger in Palmer, 1998), in 1996 Uganda published a National Environmental Education Strategy (Ministry of Education and NEMA, 1996), South Africa set up an Environmental Education Initiative in 1993, China introduced environmental education into school curricula in 1991 (Huaxim in Palmer, 1998), Hong-Kong published Guidelines on Environmental Education in Schools in 1992 (Morris, 1992), Latvia introduced guidelines for environmental education in 1996 (Meza, 1996) and Greece affirmed by a law in 1990 the introduction of environmental education in primary and secondary schools. Hence, the 1990s became the decade during which there was an intense mobilisation concerning environmental education and its establishment in the formal sector of education. There is also evidence of how environmental education was integrated in school curricula. Goffin (1991) stated that the features of environmental education in Belgium are mainly ecologically focused. Giolitto and

Souchon (1991) claimed that in France environmental education is a marginal activity because of its weak role in the official curricula. Eulefeld (1991) acknowledged that environmental education in Germany concentrates mainly on conveying knowledge on individual subject areas rather than promoting activity-based environmental teaching. Bajd (in Palmer, 1998) said that Slovenian schools work on projects with an ecological content emphasising environmental conservancy and nature protection.

Before the 1990s, environmental education was virtually equated with ecological and nature studies in general and with disciplines such as geography and biology where environmental education focused on teaching about environmental issues. One could expect this because the events and documents produced in the 1970s promoted the importance of environmental education in terms of enhancing its status. Environmental education was perceived as a significant means of helping people acquire responsible behaviour towards the environment. From the 1980s and 1990s onwards, there seemed to be a shift in the theory of environmental education. Environmental education was to create a 'new global ethic'. This new outlook started to emerge during the 1975 Belgrade workshop and the 1977 Tbilisi conference. It was to be developed to a greater extent in the later decades. Hence, publications like the *World Conservation Strategy* (IUCN, 1980), the *Brundtland Report* (WCED, 1987), the *Caring for the Earth: A Strategy for Sustainable Living* (IUCN, UNEP, WWF, 1991), *Agenda 21: Earth's Action Plan* (IUCN, 1993), the *Rio Declaration* (UNCED, 1992), the *Resolution on environmental education* (EC, Official Journal C20/94) further defined an ethical stance in which development and nature conservation can co-exist. This new ethic can be detected in the acts and publications produced by various countries previously mentioned. For example, the USA highlighted the interconnectedness between the national, social and economic environment (Disinger in Palmer, 1998). In Uganda it is important for children to realise the interrelatedness of man, his culture and his biophysical surroundings (Ministry of Education and NEMA, 1996). In Hong-Kong the aims of environmental education are to examine different types of human understandings and experiences of the environment (Morris, 1992). In Sri Lanka environmental education aims to make students aware of environmental issues and to teach them about sustainable

development by exploring the interconnections within economic, social and environmental dimensions (Peries in Palmer, 1998). In Australia there is an explicit con-jointment of environmental education with social education (Robottom, in Palmer, 1998). This focus on the interconnectedness of all living and non-living organisms constitutes a feature of sustainable living which many publications promote.

Approaches to environmental education employed various methodologies and means of incorporation in the curriculum including separate subject, infused, included, project-based, problem-solving or issue-based, elective course, cross-curricular, extra-curricular, compulsory. Choice of the approach seemed to depend mainly on individual schools' policies and less on governmental policies.

One could argue that both England and Greece do not differ significantly from other countries as to when and how they have started dealing with the establishment of environmental education in their school curricula. During the 1990s environmental education was formally integrated in the educational system of both England and Greece. In England the introduction of the National Curriculum in 1990 included it, while in Greece a law affirmed its existence in the primary and secondary schooling. More details regarding the status of environmental education in these two countries follow in the next section of this chapter. The sources of information used to inform the writing of this section are ministerial documents and circulars that are published and sent either to schools or to Local Education Authorities. It is important to note here that the sections which deal with environmental education in England and in Greece do not provide the reader with exactly the same information concerning environmental education in English and in Greek primary schools. This is because English and Greek documents have concentrated their interest on different issues and in some cases a certain kind of source is available in one country and is not in the other (e.g. in England there is a publication of the National Curriculum where one can go through the various subjects and look for references to environmental education and environmental issues, whilst there is not any such publication of the Greek National Curriculum). Also the current study's aims are discussed with reference to the way environmental

education has been established in the formal education sector of England and Greece.

3.2 Environmental Education in England.

England acquired a National Curriculum after the Education Reform Act of 1988. This Act highlighted the need for a broadly based and balanced curriculum; a curriculum which can provide pupils with spiritual, moral, cultural, mental and physical education, apart from the basic academic requirements such as mathematics and English. Provision for environmental education in the formal school sector can easily be traced from that time onwards since there is a National Curriculum which defines a general framework within which all state schools work.

The *National Curriculum* (DfEE, 1990) included the subjects of mathematics, science, English, geography, history, art, music, physical and religious education. It also comprised five cross-curricular themes, namely Economic and Industrial Understanding, Health Education, Careers Education and Guidance, Environmental Education and Citizenship Education. These themes were important because they aimed to promote education's fundamental purposes and objectives along with the other subjects of the National Curriculum. However, Kent (1995) has observed that whilst some schools responded positively to these cross-curricular themes, others did not do much about them because they had to cope with the pressure of the requirements that the National Curriculum imposed up on them. Nevertheless, Kent (1995) also claimed that these cross-curricular themes:

> *"...are not subjects competing for space in the curriculum. Rather, they provide a context and a framework for virtually all that a school does, in the formal curriculum and beyond, and they address the ways in which we are preparing our young people for their adult lives."* (p.10)

These strands are interrelated and overlap with each other because they can initiate discussions of values and beliefs concerning the individual and the community. *Curriculum Guidance 3* (NCC, 1990) referred to the cross-curricular elements as:

"...ingredients which tie together the broad education of the individual and augment what comes from the basic curriculum." (p.3)

The same publication described environmental education as a procedure which aims to promote positive and responsible attitudes towards the environment, to equip pupils with knowledge and skills that can help them understand how the environment is shaped and to encourage them protect the environment. For each of these themes there was a special publication which outlined its aims and content and gave also advice on how to incorporate it in the curriculum; *Curriculum Guidance 7-Environmental Education* (NCC, 1990), discussed the aims of environmental education, provided a framework for it, suggested ways of implementing it in the school curriculum and described case studies and classroom activities. According to this publication, the aims of environmental education are to:

- *"provide opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment*
- *encourage pupils to examine and interpret the environment from a variety of perspectives – physical, geographical, biological, sociological, economic, political, technological, historical, aesthetic, ethical and spiritual*
- *arouse pupils' awareness and curiosity about the environment and encourage active participation in resolving environmental problems"* (NCC, 1990, p.3)

This publication considered that environmental education comprises three linked components, namely education ABOUT the environment, education FOR the environment and education IN/THROUGH the environment. Each of these components were described in the publication. This 3-fold of education ABOUT, FOR and IN/THROUGH the environment reflects that described in the papers of the Tbilisi conference (UNESCO, 1977). The English curriculum is reiterating these three components because they cover an holistic approach towards environmental issues and they are in line with the aims of environmental education that the National Curriculum has established (e.g. to encourage pupils to examine and interpret the environment from a variety of perspectives). More particularly, *Curriculum Guidance 7* (NCC, 1990) aimed to develop pupils' knowledge ABOUT the environment through topics which covered a variety of issues such as: a) climate,

b) soils, rocks and minerals, c) water, d) energy, e) plants and animals, f) people and communities, g) buildings, industrialisation and waste (NCC, 1990, p.10). Education FOR the environment could be achieved through each subject which can be used to:

> *"...help pupils develop insights into human behaviour and its effects on the environment."* (NCC, 1990, p.11)

For education IN/THROUGH the environment, *Curriculum Guidance 7* (NCC, 1990) discussed direct and first-hand experiences, alongside videos, photographs and books, as important ways to help pupils gain an awareness of environmental issues.

In 1995 the National Curriculum was revised. The revised curriculum did not discuss cross-curricular themes. It included the subjects of: English, mathematics, science, technology (design and technology and information and communication technology), history, geography, art and design, music and physical education. These are the subjects which constitute the content of the National Curriculum for Key stages 1 and 2. The curriculum set out programmes of study concerned with what pupils should be taught and attainment targets which set out the expected standards of pupils' performance.

Environmental education, one of the ex-cross curricular themes of the 1990 National Curriculum, is now included and referred to in the main subjects of the revised curriculum. Environmental education is incorporated within the core subjects, notably geography and science. Within the guidelines given for each subject there are also references and links with the environment and with environmental topics.

The structure of National Curriculum of the 1995 is based on the main school subjects and on headings within these subjects. It suggests that which pupils should be aware of at the different key stages and in the different subjects they are taught. An overview of the 1995 National Curriculum helps us locate references to environmental issues. For the purposes of this current study, only key stages 1 and 2 will be reviewed. The following overview describes the references to environmental education that are suggested in all school subjects of the two key stages (1 and 2) comparatively. The presentation sequence of the school subjects is based on the

sequence that the *National Curriculum* (DfEE, 1995) has followed. The subjects omitted from this overview (mathematics, design and technology and information and communication technology) do not include such environmental references.

SUBJECT: ENGLISH

The reading section of key stage 1 requires a development of a vocabulary which should be enriched by environmental notions as well. Key stage 2 contains no such reference.

SUBJECT: SCIENCE

The heading 'Science in everyday life' requires key stage 1 children to:

> *"a. relate their understanding of science to domestic and environmental contexts;... consider how to treat living things and the environment with care and sensitivity."* (DfEE, 1995, p.2)

Another heading of the science subject, namely 'Life processes and living things' requires pupils of key stage 1 to learn about green plants (nomenclature, how is their life cycle) and about living things in their environment (different kinds of plants and animals in their area and how different plants and animals are found in different environments).

The heading 'Science in everyday life' for key stage 2 pupils, discussed ways which can protect living things and the environment. Key stage 2 pupils are to be taught about green plants as organisms where issues like plant growth, the way that plants produce food using their leaves and the importance of the root are discussed. 'Living things in their environment' is another heading where key stage 2 pupils learn about, how and why different plants and animals live in different habitats. They also learn about food chain and about micro-organisms.

SUBJECT: HISTORY

Under this subject, there is no clear reference to the environment. However, pupils at both key stages 1 and 2 are encouraged to learn about local, national and

international events, observing things that changed peoples' lives through the years. It is mostly focused on the social environment rather than the natural.

SUBJECT: GEOGRAPHY

Geography on the other hand, includes thematic studies on the environment apart from general environmental references. For instance, at Key stage 1 pupils are expected to familiarise themselves with their locality and their schools' surroundings and acquire experience through hands-on and practical activities. The thematic study at this stage concerns the quality of an environment where pupils can express views on the attractiveness or not of a place, how the environment has changed and what can be done to sustain and improve it. Also, under the heading of 'Knowledge and understanding of environmental change and sustainable development' key stage 1 pupils are to be taught to identify changes in the environment and how it can be improved and sustained. Examples that the national curriculum describes concern the number of cars in the street, the traffic pollution and how they can be dealt with (DfEE and Qualification and Curriculum Authority, 1999).

At Key stage 2, pupils have to study three localities, one in the U.K., and two others from Africa, Asia and South or Central America. These studies help pupils examine the main physical and human features of the environments they study, compare them and investigate factors that influence nature around these localities. The thematic studies proposed for Key stage 2 are to be studied, according to the *National Curriculum* (DfEE, 1995):

> *"...separately, in combination with other themes, or as part of the studies of places."* (DfEE, 1995, p. 5)

These thematic studies comprise issues like: rivers, weather, settlement (town, cities, villages and different use of land) and environmental change (human impact on the environment and the ways humans can sustain it). Moreover, under the heading which discusses environmental changes and sustainable development pupils are required to be taught how people can improve the environment, how decisions affect places and peoples' lives and how they can participate themselves, for instance, in local conservation projects so as to realise why people need to manage

the environment sustainably and how they can do that (DfEE and Qualification and Curriculum Authority, 1999).

SUBJECT: ART

Art is another subject where there are environmental references in the National Curriculum of 1995 in both Key stages 1 and 2. Hence, under the heading of 'Investigating and making' pupils should:

> *"a. record responses, including observations of the natural and made environment;"* (DfEE, 1995, p.5)

SUBJECT: MUSIC

In music pupils of Key stage 1 and 2 are to observe sounds from the environment.

SUBJECT: PHYSICAL EDUCATION

Finally, physical education in Key stage 1 aims, among other things, to teach pupils to be mindful of others and the environment.

It is clear that the 1995 National Curriculum did not envisage environmental education either as a subject in its own right or as a cross-curricular theme. Since 1995 schools have more freedom to decide how to teach environmental matters through their curriculum. However, it is important to note that the 1995 National Curriculum made sure that environmental topics and references do exist in subjects such as geography and science, as described above. The publication of the School Curriculum and Assessment Authority, namely *Teaching environmental matters through the National Curriculum* (SCAA, 1996) confirmed the above and claimed that:

> *"The geography Order, for example, requires that pupils study how sustainable development, stewardship and conservation considerations affect environmental planning and management."* (SCAA, 1996, p.4)

The same publication suggested that pupils are better taught environmental matters when schools match their curriculum with their localities, their practices and

when they make links with youth clubs and environmental organisations. Another factor that can contribute to the development of environmental education in schools, according to the School Curriculum and Assessment Authority publication (SCAA, 1996), is the fact that it should appear in schools' policies. It was argued that:

> *"Education about the environment is more likely to be successful when it features in a school's aims, policies and development plans which in turn, are implemented and monitored."* (SCAA, 1996, p.5)

The key elements presented in the above publication, which can help schools enhance environmental education comprise: a coherent programme, high quality teaching, first-hand practical experience, consistency between what is taught and practiced, links with the local community, opportunities for fieldwork, work on issues at a range of scales and a range of evidence and viewpoints.

In 1996 the Office for Standards in Education argued that:

> *"Cross-curricular themes are commonly referred to in policy documents and medium-term planning but in many schools are not well-represented in classroom work. Exceptions to this are health education and environmental education which are often well-developed."* (Office for Standards, 1996, p.26)

However, Lakin in Harris and Blackwell (1996) claimed that:

> *"...much is still left to individuals to determine how, when and where environmental education will be promoted. It has been suggested that the available 20% of curriculum time could be devoted to the cross-curricular themes. This is only a suggestion, and in reality there are many other demands on this time."* (p. 59)

Thus, environmental education in English primary schools is infused in different subjects and aims to make links between human life and the environment, to make pupils aware of their local and distant natural and social environments and to render pupils capable of judging environments according to the different circumstances that prevail. The 1995 English National Curriculum incorporated elements of environmental education that are in accordance with the definitions and ideas concerning environmental education, as discussed in the first chapter of this

study. An holistic approach is adopted, which aims to equip pupils with the knowledge and skills necessary to protect the environment, to develop positive attitudes towards nature, towards other people and towards the community in which they live. It also aims to make them aware of the inter-dependence among all sectors of society (social, political, ecological, economic) which impact on each other.

In 1999 the Department for Education and Employment produced a publication which, among other things, it discussed education for sustainable development. Thus, according to this publication education for sustainable development:

> *"...enables pupils to develop the knowledge, skills, understanding and values to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future."* (DfEE, 1999, p.23)

Finally, it is important to mention that environmental education in the UK is also supported by associations and councils such as the National Association for Environmental Education, the Council for Environmental Education, the Nature Conservancy Council, the Geographical Association. Various publications have been published by these councils and associations. Thus, one such publication by the NAEE entitled *Towards a School Policy for Environmental Education – Environmental Audit* (Baczala, 1992) aimed to help schools enhance their environmental performance. Another publication, *Ideas for enhancing the environmental performance of your school* (NAEE, 1994) suggested ideas that schools can implement in their environmental practices. The Council for Environmental Education has produced similar publications which aimed to help schools integrate environmental education in their curriculum. Such were the *Inset 5-16 Environmental Education for Science* (CEE, 1993) and *Inset 5-16 Environmental Education for Geography* (CEE, 1994a). Other publications by the Nature Conservancy Council were those of *Nature areas and the primary school curriculum* (Pollard, 1988/89) and *Opening Doors for Science* (Association for Science Education and Nature Conservancy Council, 1990). Their aim was to help and encourage schools to take up environmental activities. The Geographical Association has also contributed to environmental education practices with

publications such as *Awareness into Action – Environmental Education in the primary curriculum* (Chambers, 1995) and *Primary Fieldwork Projects* (May, 1996). Learning Through Landscapes have also contributed to schools' environmental practices with various publications.

Apart from all these associations and councils, environmental education is also promoted by the Field Study Centres. These can be either residential or day centres. They offer many advantages to schools such as curriculum resources and equipment, more time to work with pupils, experts on particular issues and opportunities for fully integrated cross-curricular approaches (Chambers, 1995). These centres can be operated by local authorities, by industries or by the National Trust.

3.3 Environmental Education in Greece.

In Greece environmental education is not defined as a cross-curricular theme. According to a law introduced in 1990, environmental education constitutes part of primary and secondary schools' programmes. Before 1990, though, various efforts had already started to disseminate environmental education in Greece. In the period between 1977 and 1982 there were the first developments in the field of environmental education. Some of these significant developments included the first seminar of environmental education for teachers in 1980, the training of twenty Greek science teachers at environmental centres in France, the organisation of a teacher training seminar on environmental education by instructors from the European Council, the introduction of a new school subject ('Study of the Environment') in the first four grades of primary school and the participation of Greek schools in the primary and secondary education network of the European Community environmental education programme. In the period from 1983 to 1989 more developments occurred, such as the establishment of a team of teachers, initiated by the Ministry of Education, trained in environmental education who were responsible for promoting environmental education programmes, for training teachers, for evaluating the programmes and for making suggestions. Finally, in the 1990s, environmental education has been established, by law, as part of the primary and secondary school curricula. It is promoted at a local level by the people who are

responsible for environmental education issues in every county and Environmental Education Centres have been established in various parts of Greece.

More particularly, environmental education in primary schools can function at two levels; either within the fixed weekly programme, in slots which are determined by teachers' and classes' timetable or within the School Activities Programme. Teachers who undertake environmental education programmes have two extra hours in their schedule for the teaching of environmental education.

It is acknowledged that environmental education is not a subject in its own right, which requires teachers with a particular scientific and cognitive background. Environmental education demands the active participation of pupils. It is not confined to the school's curriculum and it comprises simple and more elaborate activities which aim at the investigation and solution of an environmental problem or issue.

In the Circulars sent to primary schools, environmental education is described mostly as an activity, or better as a project-based dimension on which teachers and pupils need to work together. It is believed that the best way to engage in such a project is by looking at it from all different angles, hence representing the different school subjects. A Ministerial Circular (Greek Ministry of Education, 1996) which was addressed to the Local Environmental Education Offices, described environmental education as a procedure during which people acquire knowledge, values, skills and experiences that are needed if people are to understand and appreciate the interdependence among man, culture and his biophysical environment. Furthermore, people should learn to participate actively in solving present and future environmental problems making sure that, whilst they satisfy their needs, they do not compromise the needs of future generations. It is clear that such a description of environmental education is influenced by the definitions and aims that have been attributed to environmental education by the significant international events that have been described in the first chapter of this thesis.

Teachers in Greece have the support of the Centres of Environmental Education, which exist in various counties. Locally, in every county, there is one person responsible for environmental education issues in both primary and secondary education. This person is a seconded primary and secondary school

teacher respectively who usually seeks to be appointed to that position. This secondment lasts for a period of three years. His/her responsibilities are to observe programmes of environmental education which are implemented in schools in his/her region, to provide schools with all sorts of informative material on environmental education, to encourage schools to take up environmental education programmes, to organise in-service training seminars, to co-operate with other civil or private services which can support environmental education programmes, to take part in the training sessions that the Ministry of Education organises, to work with the Education Departments of Universities, to support and promote the work that is being done in the Centres and to organise once a month a meeting for teachers who carry out environmental education programmes in order to make their work known to others and get useful feedback.

The Centres of Environmental Education are responsible for informing schools, which belong to their jurisdictional area, on the kind of environmental programmes they run and on whatever else they feel is important for schools to know (Greek Ministry of Education, 1996). These Centres also plan and support environmental education programmes, they organise in-service training courses for teachers, they develop national and international liaisons and they contribute to the development of research in the field of environmental education. Schools that wish to take part in the programmes that the Centres run, have to submit a participation-application form. The Centres will then decide which schools they will accept. If the number of schools, which apply exceeds the number of schools that the Centre can accommodate in a year, then a random selection of schools takes place. However, 60% of the school-applications should be from schools, which already have had experience with environmental programmes and 40% from schools with no such experience. Centres for Environmental Education and schools of their jurisdictional area can work together and make other arrangements even if these schools do not attend Centre initiated and delivered projects. There are seventeen such Centres for Environmental Education dispersed all over Greece and they can be either residential or day centres.

The idea of participating in environmental education programmes is popular in Greek primary schools. It is hoped that with programmes like these pupils will

acquire knowledge, become sensitive to the environment, gain a good perception of the interaction developed between man and nature and they will be able to approach a problem/issue, understand it and work on its solution. Finally, it is hoped pupils may acquire a new ethic concerning people's behaviour towards the environment.

In Greece, primary schools consist of six grades. The weekly timetable of the first two grades have nine hours of literacy (reading and writing), four hours of mathematics, four hours of aesthetic education, four hours of physical education and four hours of 'Study of the Environment'.

The third grade has two hours of religious education, nine hours of literacy (reading and writing), four hours of mathematics, two hours of history, three hours of 'Study of the Environment', three hours of aesthetic education and two hours of physical education.

The fourth grade has the same amount of hours for all subjects as the third grade but one more subject; English is added which requires three hours per week. Fourth grade is the last grade where 'Study of the Environment' is taught to children. It is important to emphasise that in the third and fourth grade the hours for the 'Study of the Environment' reduce to three instead of four hours that are available in the first two grades.

In fifth and sixth grades geography, physics and social and political education are being introduced as new subjects in the curriculum. For geography and social and political education one hour is dedicated in each grade while three hours are defined for physics. The other subjects of the fifth and sixth grade comprise religious education (two hours), literacy (eight hours), mathematics (four hours), history (two hours), aesthetic education (two hours), physical education (two hours) and English (three hours).

Environmental education is not a specific subject. However, there are other subjects, which are akin to environmental education, for instance, 'Study of the Environment', aesthetic education, geography and social and political education.

The subject 'Study of the Environment' which is taught in the first four grades of primary school, includes many environmental topics. These topics are varied and repeated in the first four primary school grades, each time with more detail. They include topics concerned with the locality and topics that are concerned with general

environmental issues. Other topics are concerned with people and the jobs they do whilst yet others are concerned with the natural environment. For instance, in the first grade the subject 'Study of the Environment' deals with issues such as the school premises, the classroom, the notion of family, the neighbourhood, the place where pupils live or with issues such as plants, animals (where and how they live and grow), with water, with factories. In the second grade some of these topics are revisited (e.g. school premises, family, animals, plants, weather, factories, etc.) and there are some new ones (e.g. people and how they change their environment, transport and travels, taking care of our body and health, local history). In the other two grades same topics appear again, but with more information and detail.

In Thompson (1997), Glavanis discussed the status of environmental education in Greece and claimed that:

> *"...the present situation may still be characterised as inadequate because of: (1) insufficient school equipment, (2) ineffective use of free time, (3) negative use of youth dynamics concerning environmental problems, (4) inadequate scientific research in EE, and (5) the lack of continuous and well-organised training for primary and secondary EE teachers.* (p. 19)

3.4 Observed Differences and Similarities between the two countries' policies for Environmental Education.

It is clear that England and Greece dealt with environmental education in the formal sector of education in different ways.

The former (England) attempted to include and infuse environmental education in the subjects of the National Curriculum by giving instructions on what can be taught about the environment through the different subjects. In almost every subject of the *National Curriculum* (DfEE, 1995) there were references to environmental issues, with the majority of references appearing in geography and science.

Greek schools, on the other hand, promoted the idea of environmental education programmes, which are planned by teachers and pupils together along with the help and support of out of school agencies. The Centres for Environmental Education play a significant role in these programmes and in providing school pupils with significant environmental experiences. At the same time, there are subjects in

the National Curriculum, which can promote environmental education such as the 'Study of the Environment', social and political education.

Both countries felt that environmental education should not be a subject in its own right and that it should not be taught separately in the way other school subjects are taught. Environmental education should have contributions from all subjects. Its multi-disciplinary character was emphasised in their school curricula. Interestingly, however, the second chapter of this thesis discussed how ecocentric and technocentric ideas have influenced environmental education and its status in the school curricula. It was deduced that school curricula, as they exist today, have mostly been influenced by the technocentric ideology (that is, promoting acquisition of knowledge through books and lectures). The description of the current status of environmental education in Greece and in the English National Curriculum suggested that the incorporation of environmental education in the curricula bears more ecocentric than technocentric characteristics. It is clear that the acquisition of environmental knowledge is not the only aim, since both countries' curricula aim to teach pupils about the interconnectedness of living and non-living organisms on our planet and to develop caring and responsible feelings towards the protection of the environment. Thus, one could claim that environmental education and its ecocentric characteristics were introduced into what is a generally technocentric school curriculum and teachers are expected to reconcile the two in the best possible way. The literature review has shown that teachers have difficulties in doing so, with some of these difficulties being more problematic than others. It has been shown that teachers' difficulties in teaching environmental education varied from external factors such as lack of time and money, to internally controlled ones such as lack of training and lack of resources.

Considering that environmental education aspires to achieve a new ethic (the first chapter of this thesis has discussed the development and aims of environmental education) and bearing in mind that school curricula still have a more vocational orientation rather than a more liberal and flexible one, questions emerge as to how this new ethic can finally develop and become dominant. Research evidence so far in the field of environmental education has exhibited both hopeful and discouraging findings. The next chapter describes research studies conducted in the field of

environmental education in relation to teachers' awareness of and motivation to teach environmental education.

4. REVIEW OF EXISTING ENVIRONMENTAL RESEARCH RELEVANT TO THIS STUDY.

Preamble

This chapter is concerned with a review of certain aspects of research projects that have taken place within the field of environmental education. More specifically, it focused on research projects in which a particular emphasis is placed on teachers' awareness of, and practice of environmental education. Thus, the chapter presents a view of how teachers perceive and relate to environmental education. It gives some indication of what research has already been done in this field, how it has been done and what conclusions have been drawn. The articles that will be presented in this literature review have been published in the key journals of the field, namely: *Journal of Environmental Education* (USA), *Environmental Education Research* (UK), *Canadian Journal of Environmental Education* (Canada), *International Research in Geographic and Environmental Education* (USA), and *Pedagogical Education* (Greece).

Whilst this literature review focuses on studies which have examined environmental education in respect to teachers' practices in and awareness of environmental education, there are studies that go beyond the scope of the present investigation. Thus some items included in this literature review have a more general character. The prime purpose of this chapter aims to describe the kind of studies that have been conducted in the field of environmental education in relation to teachers. Consequently, this literature review aspires to establish a framework within which the current investigation can claim its place. It attempts to exhibit in what way the present study could provide new insights in the field of environmental education research.

Before the literature review is presented, it is important to once again mention that this study is concerned with primary school teachers' awareness of and motivation to teach environmental education and with their general environmental awareness in the Northeast of England and Northern Greece. Its comparative character aims to determine influences that lead to the development of teachers' views on environmental education, especially teachers who come from two different European countries with different educational backgrounds.

The following studies are presented in chronological sequence, beginning with the earliest and covering a period from the early 1970s to the end of 1990s. There is no reference to studies that took place before the 1970s, since most of the major events in the development of environmental education commenced at that time. The presentation of the studies followed a chronological order. This organisational approach has been selected rather than a thematic one because it would not be easy to present the studies based on the themes they were investigating because most of them focused on different aspects of environmental education. In the same way a methodological base was not used because there were studies that used a combination of approaches. Hence, a chronological order was preferred over any other system of presentation.

Hence, the following section (4.1) of this chapter describes the actual research studies, discussing at the same time the research paradigm they followed, the methods they used in order to collect their data and how they can be related to the present study. Then section 4.2 discusses general characteristics of research studies in the field of environmental education and sets the present study within the context of these general characteristics.

4.1 The research

Mirka (1973) investigated factors, which influence elementary teachers' use of outdoor classrooms. He aimed to reveal factors that motivate teachers to use or not to use the outdoors in their teaching.

The sample was taken from the Public Schools of Parma as it is one of the largest suburban school systems in the greater Cleveland (USA) area and all schools have more or less similar potential for conducting outdoor education activities. The sample was divided into two experimental groups: the teachers that use the outdoors in teaching, the 'Haves'; and the teachers that do not use the outdoors in teaching, the 'Have Nots'.

The research instrument was a mailed questionnaire. The response rate was 82% and from that 78% of the mailed forms were usable in the analysis of the research. The personal and professional background of the teachers was surveyed.

They shared similar characteristics such as age, suburban home background, work with youth outside of school, bachelors' and masters' degrees and class sizes.

The items of high influence, showed that the 'Haves' experimental group used the outdoors in teaching for the following reasons, given in this order of importance: the value of these experiences to children, available outdoor areas, an understanding of classroom subject application to outdoor instructional activities, a knowledge of outdoor instructional activities, personal feelings about the outdoors, the influence of such activities on daily life, the results of previous outdoor activities and class size.

The 'Have Nots' experimental group did not use outdoor instructional activities for reasons ranked in the following order: lack of available outdoor areas, knowledge of outdoor instructional activities that can be conducted outdoors, the availability of curriculum guides and curriculum planning materials, the availability of resource people to help with outdoor instructional activities, their understanding of the application of classroom subject matter to outdoor instructional activities, their knowledge of natural sciences, class size and finally the value of such experiences to children.

In comparing the responses of the 'Haves' and 'Have Nots' groups, it is obvious that teachers who have the same potential to use outdoor activities used the same reasons to justify their choices. For instance, one of the very important reasons that the 'Have Nots' gave for not teaching outdoor activities was a concern with the availability of outdoor areas. The same reason was given by the 'Haves' group as the second most important reason for teaching outdoor activities. It is clear that different teachers perceived the different items in a different way based on their personal and professional background.

Mirka's study is quantitative as it used a fairly large sample (267 participants) and its instrument was a 24-item inventory in which teachers had to rate these items according to what they considered as the most important reason for teaching or not teaching outdoor activities. Even though teachers' personal and professional backgrounds were surveyed, the study did not give any causal relationships between teachers' choices and teachers' backgrounds. It revealed how much certain factors influenced teachers' practice of education in the outdoors but it did not show where these factors can be attributed to.

This research can be related to the present research, which refers to teachers' motivation to teach environmental education. The pertinent questions in the current research ask teachers whether they taught environmental education, when was the last time they carried out an environmental project or they made reference to environmental issues and if they used their school's surroundings. Unlike the Mirka study however, these questions try to detect teachers' general practice of environmental education and not only teachers' use of outdoors areas. Hence, the current study provides teachers with the freedom to elaborate on their answers. Their practice of environmental education is investigated without limiting it exclusively to outdoor activities, and certainly without limiting it to particular statements which may prevent teachers from doing their own thinking.

Jaus (1978) of the Department of Education of Purdue University, Indiana, conducted a study that investigated the effect of environmental education instruction on teachers' attitudes towards teaching environmental education. He was interested in relating training in environmental education with teachers' willingness, motivation and preparation in the teaching of it.

The sample that was used comprised fifty-one elementary and middle school in-service teachers who were randomly assigned to two groups, the experimental and the control group. Both groups attended graduate-level science methods classes for 20 days. For the first 10 days both groups were provided with the same instruction which referred to basic and integrated science process skills. During the next 10 days, the instruction that the experimental group received concerned environmental topics and the methodology of teaching environmental education in grades K-8, while the control group received instruction on question-asking techniques, various school curriculum projects, science textbooks series, inquiry teaching. The presentation of the topics in both groups was achieved with similar means such as laboratory activities, lecture-discussions and readings; for the control group there were also teacher and student demonstrations.

The instrument that was used to measure teachers' attitudes was a Likert-type scale consisting of five categories starting with strongly agree and ending up with strongly disagree. The instrument contained 30 statements which were designed to fall into three categories. One category was concerned with the importance of

environmental education in the elementary and middle school curriculum. A second category contained statements concerning the outcomes of teaching environmental education and a third category was about teachers' willingness to teach environmental education in their classrooms.

After 20 days of instruction, teachers were tested on the knowledge they had acquired. The results of the study showed that both groups favoured the teaching of environmental education. However, the group of teachers who received training in environmental education had more positive attitudes towards teaching environmental education in their classrooms than the teachers who did not receive this training.

This study is predominantly characterised by the quantitative approach, as it aimed to establish a causal relationship between the instruction that teachers received on environmental education and the effect that this instruction had on their teaching of environmental education in their classrooms. The research measured teachers' knowledge of the environmental topics they worked on, along with the attitudes that teachers in the experimental and control group possessed after they received the instruction. The investigation gave numerical and statistical results that supported the study's question which was whether teachers who are trained in environmental education exhibit more positive attitudes towards teaching this subject than teachers who are not trained.

The present investigation does not directly examine the influence of environmental education instruction on teachers' attitudes to teaching environmental education. As one of its main goals is teachers' motivation to teach environmental education, it poses questions concerning pre- and in-service training programmes. It aims to discover whether there is such training and how much environmental education is taken into serious consideration by teachers, by schools and by universities. Secondly, it detects how helpful these training programmes are for teachers. It cannot be claimed that the current study will give any causal relationships between these training programmes and teachers' motivation to teach environmental education. However, it asks teachers to discuss what kind of training programmes they feel they need the most; that is, should such a programme be focused either on environmental information or on teaching guidance.

McCaw (1979) conducted research concerning teachers' attitudes towards environmental education at the Ohio public schools of Columbus. His objectives were to determine the extent to which teachers practice environmental education by study trips and school-site studies. He wanted to see where teachers take these trips, what is taught to students, where they rank environmental education and other "non basic" elements of the curriculum. Finally, he aimed to discover how willing teachers are to teach environmental education and what factors prevent them from doing so.

The sample for his research comprised teachers from all school ranks, that is from elementary, junior high and senior high schools. The teachers were asked to complete questionnaires which were mailed to them. The research instrument, the questionnaire, was based on the existing literature and on discussions with district personnel. The items of the questionnaire were concerned with study trips, with how often the pupils went out and what kind of subjects teachers taught. Also, it was investigated where teachers ranked environmental education in comparison with other school subjects.

The results of the study showed that elementary school teachers ranked environmental education first when they compared it with music education, with art education, with sports, with extra-curricular clubs, with consumer and vocational education. Instead, the junior and senior high school teachers ranked environmental education second and third, respectively, when they compared it with the same other non-basic parts of the curriculum. Junior and senior high schools were found to consider consumer and vocational education more important than environmental education. Elementary school teachers taught all subjects to their classes, not just one or two disciplines, and that helped more them to refer to environmental education issues in their classes. As far as study trips were concerned, it was found that they were more popular with elementary school teachers, as elementary teachers took nearly 40% more study trips per teacher than did those in secondary. However, 72% of all teachers who took study trips went to indoor sites. This was due to various reasons such as transportation problems, financial problems, abundance of high quality indoor sites in Columbus.

McCaw's research was mostly focused on outdoor/indoor environmental education. There were no indications of what teachers' knowledge of environmental education was, and what their awareness of environmental matters was. That is, the study did not present us with information that would enable readers to understand the broad or limited extent to which teachers used environmental education and why they rated environmental education as first, second or third in the "non-basic" parts of the schools' activities.

This research is also associated with the quantitative approach as it measured the importance of certain factors, which played a significant role in the teaching of environmental education. Teachers ranked environmental education in the first, second or third place for reasons that were not revealed in this study. They were asked to do so in relation to other "non-basic" school subjects so that the extent to which environmental education was being taught in schools could be identified and quantified. Teachers did not have the opportunity to elaborate on the answers they gave. However, it must be mentioned that the research instrument was based on the available literature of that time and on discussions with district personnel. Of particular interest in this research was what it revealed about the frequency with which teachers used outdoor and indoor activities. The study revealed that teachers from elementary and secondary schools dealt with such activities differently.

The present research does not focus on outdoor/indoor activities. It aims to see how teachers practice environmental education either in outdoor or in indoor areas. There are no comparisons between elementary and secondary teachers as all teachers participating in the investigation are primary school teachers. The comparison between teachers will be achieved by comparing the teachers' views from England with the teachers' views from Greece. Teachers are not asked to rank environmental education alongside other school subjects or activities. Their motivation to teach environmental education is not detected only by the frequency of the study trips they take, which is but one form of delivering environmental education. There are questions which address also teachers' awareness of environmental education rather than their attitudes. These questions concern definitions of the term, descriptions of its school curriculum content and its most significant aspects.

Karl Schwaab (1982/83) conducted research concerning the use and effectiveness of instructional methods in environmental education. He was interested in discovering the effectiveness of certain given strategies and how frequently teachers used them.

His sample comprised public school personnel from Illinois, who "*...had been identified as currently providing an environmental education curriculum.*". Out of 296 potential respondents, 117 replied. He collected data using a survey instrument. A Likert-type scale was provided for the respondents to rate the effectiveness of the given methods and to establish the degree that they used them in their teaching. Teachers came from all school levels. The majority of teachers from all school levels reported presenting environmental education as a part of other courses. It is notable that half of the high school respondents considered that environmental education could be a specific course.

The results of the study showed that, in the main, teacher-led discussions and the lecture method of delivery were used. However, the lecture method was considered the least effective method, while the inquiry method, which was used by 84% of the teachers, was considered to be the most effective. Other methods that were presented to teachers were: individual projects, demonstrations, individual reports, readings, student-led discussions, group reports, independent study, cognitive skill development and debates. Teachers searched for resources from state and environmental organisations rather than from local agencies or industry. Field trips were also popular as they were used by 67% of the respondents and the ones that lasted half a day were considered to be most effective.

The main concern of this study concentrated on the use and effectiveness of instructional methods. Neither did it make any distinctions among the three different school levels that teachers came from, nor did it specify the sort of methods that social science or physical science or maths or art teachers were using. It is quantitative research since it comprised a fairly large sample (117 respondents) and it used a survey instrument to measure how much teachers used certain method aiming to produce generalizable data.

The current research is also interested in the use of instructional methods in environmental education, albeit amongst other things. Instructional methods are not

the focus of the current study, but there are a number of questions which attempt to investigate teachers' views concerning effective ways of presenting environmental knowledge to pupils. Such questions are the ones that asked teachers to discuss how environmental education could best be implemented in school curricula and how environmental knowledge can best be presented to pupils so as to engage their interest. However, the current study does not present the teachers with different instructional methods asking them to discuss their effectiveness. It just seeks to investigate what method, according to primary school teachers, is most appropriate and effective in order to present environmental knowledge to pupils.

Ham and Sewing (1987/88) conducted a research project entitled: "Barriers to Environmental Education". The main research question concerned the barriers that prevented teachers from implementing environmental education programmes in the school curriculum. From studies previously undertaken, four groups of such barriers had been identified; the conceptual barriers which referred to a lack of consensus as to what environmental education is and what its content and scope might be, the logistical barriers which derived from a perceived lack of time, materials, funding, resources, suitable class size, the educational barriers which concerned teachers' own ideas about whether they feel confident and capable of teaching environmental education and, finally, the attitudinal barriers stemming from the teachers' attitudes towards environmental education and science instruction. Hence, these four categories shaped this study's objectives which were: to discover how teachers defined environmental education, where teachers placed environmental education in the school curriculum hierarchically, to identify how teachers perceived the importance of certain logistical barriers such as lack of time, lack of funding and transportation problems, to determine teachers' perceptions of their preparation and training to conduct environmental education and, finally, to discover where teachers ranked environmental education in relation to other parts of the curriculum.

The investigation took place in six school districts in the Palouse region of eastern Washington and western Idaho. A stratified random sampling was used. The size of the sample was ninety-one elementary teachers, well-experienced and with various academic backgrounds. The instrument of the study was personal interviews.

Results showed that for 42.7% of the teachers, environmental education meant the teaching of knowledge and ensuring an awareness of content pertinent to the environment. For 34.8% it was to teach pupils to use resources wisely, and for 33.7% to teach them about interactions and interdependencies in the environment. Appreciation of the environment and problem-solving projects had low percentages, 16.9% and 9% respectively. As far as environmental education's place in the school curriculum was concerned, the majority of teachers (62.6%) felt that science was the subject through which environmental education should be taught. Interestingly 60% of the teachers with a non-science background considered this to be an important factor in their not teaching environmental education. Social studies was the second subject suggested by 36.3% of teachers, whilst only 29.7% thought that environmental education should be taught throughout the curriculum, and from this only 8.8% of teachers actually reported doing so. Lack of time in the school day, lack of preparation time, lack of environmental education instructional materials and lack of funding were the four most important barriers teachers identified as preventing them from teaching environmental education. In addition, the teachers in this study ranked environmental education seventh in importance in a sixteen-item list of non-traditional subject areas. A six Likert-type scale was used to rate the importance of the sixteen non-traditional subject areas. When teachers were asked to mention how often they conducted environmental education discussions and activities, almost half of them (42.6%) gave the answer of "now and then".

This research project has both a qualitative and a quantitative character. Its qualitative character was shown in the first question concerning definitions that teachers gave to environmental education. They had to complete the rest of a sentence which started in the following way: "Environmental education is...". That is, teachers were allowed the freedom to express their personal ideas about what environmental education was. Later on in the study, Likert-type scales consisted of barriers already given a priori to them, were used to measure teachers' attitudes and perceptions of environmental education.

The current research aims to discover definitions that teachers give to environmental education as well as to identify what inhibited or facilitated teachers in teaching environmental education. The difference is that the current study does

not provide teachers with lists of barriers to environmental education or factors, which might facilitate the teaching of environmental education and does not ask teachers to rank them. Rather, it seeks to find out what these barriers and facilitating factors are from the teachers themselves.

Dorion and Gayford (1990/91) published a project on environmental education and primary school pupils. The aims of the research were to determine how primary school teachers perceived environmental education and its aims, what its affective and moral dimensions were, its holistic approach, the strategies favouring its inclusion in the school curriculum, the kind of problems teachers encountered, what actions could improve its delivery in school and what was the nature of any in-service training courses undertaken.

The sample of the study comprised primary school teachers who had been identified as people involved in the management and implementation of environmental education. The instrument of the study was a questionnaire containing both open-ended and closed-ended questions relating to the objectives of the study. Also, interviews were conducted with key-people from the local authorities and document analysis occurred. Schools, local authorities and field studies centres provided such documents. One hundred and seventy two questionnaires were distributed and 112 were returned.

The findings of the study revealed that the majority of teachers believed that environmental education involved both the cognitive and the affective domain. Over 90% considered that it was important to involve children in the conservation and improvement of their local surroundings. Issues they touched upon included: identification of plants and animals (90%), exploration of the surroundings (78%), walks in the local area (73%), tending plants and animals in the classroom (64%). The natural environment, endangered species and concern for wildlife were also considered very important. Ninety-two per cent (92%) understood the environment to mean 'wildlife', 77% the countryside, 59% the built environment, 45% cities and towns and 35% heritage. The majority of teachers (68%) undertook action-based projects in their own school grounds, but few of these projects involved decision-making skills. Controversial issues related to the environment were considered important, but less appropriate at the primary level. That said, 86% of the teachers

agreed that children should become involved in working on issues such as energy, acid rain and population. In addition 88% of teachers addressed issues related to conservation, 85% issues related to pollution, 78% issues related to natural disasters and 73% issues related to endangered species. However, they tended to focus on the scientific aspects of these issues and not on the social, political or economic factors and their implications. Virtually all teachers (98%) agreed that environmental education should be an integral part of the school curriculum rather than a separate subject, though 33% of the aforementioned teachers thought that environmental education could be a separate subject in its own right as well. The majority of teachers (86%) had attended in-service training courses for environmental education in the last five years. The ones that had not attended any courses were either head-teachers or they were involved in the development of such courses. Finally, the hurdles that these teachers perceived as preventing environmental education from being implemented in school curricula were: a need for in-service training dealing with ways of incorporating such education into practice (96%), a lack of expertise concerning controversial issues (66%) and other impediments were identified such as children's background, the nature of the subject and external constraints. Lack of time (71%) and transportation (65%) were identified as the most important problems related to the school itself. Teachers thought that there was a need for policies on environmental education and 75% considered the development of the National Curriculum as an important step towards improving the current practice.

The aforementioned study examined primary school teachers' views concerning the nature of environmental education, its aims, its content, and its practice. It is a combination of qualitative and quantitative study. The fact that their sample was already involved in environmental education permitted the researchers to include both closed-ended and open-ended questions. For instance, they identified the percentages of teachers who addressed conservation issues or pollution issues and then they were able to indicate that teachers tended to emphasise the scientific aspect of these issues rather than the social, political or economic factors. At the same time, they interviewed people from the local school authorities and they analysed various documents.

The present study aims to investigate similar features in primary school teachers' perceptions. However, its sample teachers are selected randomly from schools whose awareness of environmental education is not known. Moreover, the instrument it used is a semi-structured interview and it is not accompanied by document analysis or by interviewing other people from the local authorities.

Spork (1992) conducted a research study entitled: " Environmental Education: A mismatch between Theory and Practice". Her aim was to investigate the apparent mismatch between what environmental education should be and what was actually going on in schools. Her prime interest was in determining the precise nature of environmental education taught.

The sample for her research comprised 300 full-time state primary classroom teachers of one of the 12 education regions in Queensland, Australia. The sample was achieved using a random selection table and from the 300 teachers, 228 responded, that is 76%. The instrument used was a postal questionnaire.

The objectives of her research were to determine teachers' practices, attitudes and concerns relating to environmental education and to describe the professional preparation of teachers in this field.

As far as teachers' practices were concerned, respondents were given seven aspects of environmental education and were asked to identify those they had included in their class programmes over the preceeding 12 months. The results indicated that education IN and ABOUT the environment were included in teachers' classroom programmes to a far greater degree than was education FOR the environment.

As regards the professional preparation of the teachers, the research showed that 85.8% had never received any training in environmental education. Only 4.9% of the teachers were the recipients of in-service training and just 3.1% had undertaken college or university post-graduate studies in environmental education.

In an attempt to identify the sample teachers' personal attitudes, they were asked to rate nine learning areas (drug education, sports and recreation, languages other than English, music education, human relationships education, computer education, multi-cultural education, environmental education, drama and music education) in order of importance to them. Ranked first was human relationships

education followed by environmental education. In addition, the teachers were asked to quantify the importance of the seven aspects of environmental education itemised earlier. Here, most teachers regarded all forms of environmental education as either "very important" or "important". The comparison between the importance rating of all seven aspects and the actual implementation levels of these various aspects indicated that there was a difference between what teachers regarded as being important to include in environmental education programmes and what teachers actually implemented in practice. Once again, the greatest differences were found in the statements, which referred to education FOR the environment.

With regard to teachers' concerns, the results indicated that the teachers' major concerns were lack of time, lack of resources, lack of own knowledge and skills in this area and lack of their own knowledge of departmental regulations on such activities.

The results of this study in Australia showed that environmental education was mostly focused on education ABOUT and IN the environment and not FOR the environment. It also demonstrated that the vast majority of teachers had received no formal training in environmental education. Consequently, the study clearly identified the mismatch between theory and practice in environmental education. The study's conclusions about teachers' practices, attitudes and concerns were identified mostly through the aforementioned seven aspects of the learning areas of environmental education that were presented to the teachers by the researcher. It did not show what teachers actually knew about environmental education and how aware of environmental issues they were. The focus of the research was on the amount of environmental education in one form or another, that teachers delivered in the classroom.

This study followed the quantitative approach, as it used a mailed questionnaire to measure a large sample's practices, concerns, attitudes and professional preparation in environmental education. The teachers did not actually express their own perceptions of environmental education. Instead, they were given a list with various aspects, concerning both environmental education issues and their practices, which they had to prioritise without having the opportunity to explain their choices. The fact that they characterised environmental education as the "second most

important" learning area showed that they considered environmental education to be significant, but mostly on a theoretical level. This conclusion can be drawn because they did not give any reasons for this rating. They just had to show their agreement or disagreement, their satisfaction or dissatisfaction with the statements that they had been provided with.

The present research tries to discover the way teachers perceive the nature of environmental education and not as much the form that the delivery of environmental education might take in the classroom. It is interested in the meaning of environmental education that teachers ascribe to it based on their experiences and studies. Interviewees are left free to talk about their ideas concerning environmental education without giving them any statements to rank. For instance, education ABOUT, IN/THROUGH and FOR the environment are not considered as features that teachers were investigated upon. However, teachers' replies led to these features and to the way they viewed them in the curriculum and in their practices.

Papadimitriou (1992) conducted research that aimed to investigate teachers' views on environmental education and the factors which determined their active participation in it. The study was carried out in Greece and involved 32 secondary school teachers who were selected based on their teaching experience in general and on their experience in environmental education in particular.

The study's instrument was a questionnaire comprised of open-ended questions along with additional data collected from discussions the researcher had with some teachers in teachers' education centres.

Twenty-three of the thirty-two teachers were physicists, chemists, biologists and geologists and the remaining nine were language teachers, maths teachers and theology teachers. The study aimed to find out what they believed the notion of environment meant, what they thought of environmental education's inter-disciplinary character and what were environmental education's goals.

The first aim was investigated by asking teachers how many environmental education programmes they had undertaken and what were their titles. The answers given showed that teachers did not confine their notion of the environment exclusively to the natural environment but that their perception of it was much

broader, as 72% of the programmes they had conducted referred to the urban environment.

The second aim concerned the inter-disciplinary character of environmental education. The results showed that the majority of teachers believed that environmental education was related to all subjects and they collaborated with one or more teachers covering all the subjects found in the curriculum. Hence, teachers had a clear perception of environmental education's inter-disciplinary character and did not only connect it with the natural sciences.

The third aim concerned environmental education's goals. Also, teachers were invited to respond to the question 'can environmental education contribute to the environment's salvation and, if so, in what way'. All teachers responded positively to the question, apart from one who did not give an answer. Thus, the environment can be saved by accomplishing cognizant goals according to 28.3% of the teachers, by accomplishing emotional goals according to 58.2% of the teachers and by taking up action according to 13.4% of the teachers. They considered that the action would come as a result of sensitising and informing students.

The research also asked teachers about the place of environmental education within the school curriculum. Thirty teachers replied that environmental education was an innovative form of education and only two responded negatively. As far as environmental education's significance was concerned, 21 teachers considered environmental education more important than other school subjects, 6 teachers saw it as very important, and 5 teachers saw it as sharing equal importance with the rest of the school subjects. However, 26 out of 32 teachers did not agree that environmental education should be incorporated into the school curriculum, whilst four teachers suggested that it should be incorporated into the natural sciences, 1 suggested that it should just permeate the timetable, and 1 did not give an answer.

It could be argued that this research has elements of both the quantitative approach and of the qualitative approach. The study used a questionnaire, an instrument appropriate to measure knowledge and attitudes, but at the same time the open-ended questions, the small number of participants (32 teachers) and the personal contact that the researcher had with the sample, gave teachers the opportunity to elaborate on their replies. At the same time, the results of the

investigation produced statistics concerning the practice of environmental education by teachers who had experience of environmental education and their engagement to environmental education was one of the criteria required to fit the sample.

This research can be related to the present study as it also investigates teachers' awareness of environmental education and the way they engage themselves in practicing it, if they are so. The sample teachers for this investigation came from the secondary sector and was limited to Greek teachers, whereas the present study extends this to include English as well as Greek teachers therefore resulting in a comparative study between these two countries. Primary school teachers rather than secondary practitioners were selected, as the comparisons become much more feasible between teachers who did not teach only one subject exclusively. The questions used in Papadimitriou's research are related to the questions of the current study as they are also concerned with the inter-disciplinary character of environmental education, with the way teachers carry out environmental education programmes, with what sort of topics interest them and whether they prefer working on their own or in collaboration with their colleagues.

Simmons (1993) investigated teachers' perceptions of environmental education opportunities using natural areas, in four cities in the Chicago Metropolitan area.

Her sample comprised 39 teachers of whom 85% were women and 15% were men, 31% had 16 or more years of teaching experience, 26% from none to 5 years, 25% from 6 to 10 years and 18% from 11 to 15 years. At the same time, 56% had training in environmental education and 44% did not. The sample comprised teachers from kindergarten through to sixth-grade.

The research project's instrument was an interview, which was conducted in two parts. Firstly, the researcher asked the teachers to rate 36 black-and-white photographs based on personal preference. Afterwards, teachers were asked to sort the photographs into three to seven piles that "*...make the most sense to them...*", and then to choose one from each pile that best represented the photographs in that pile. The photographs showed rivers, ponds and marshes, deep woods, interpretive paths, country parks, open fields, urban nature and school sites. For each of the photographs that the teachers had selected, the researcher asked questions concerning their likes and dislikes, what sort of things they could and they would do

with students, what were the things that would make the outing successful, whether they would like to take their students to a place like this and whether they had attended an environmental education training session in a place like this.

The results of the study indicated that teachers had all sorts of ideas about these natural areas. They expressed openly feelings that these places triggered in them and at the same time suggested topics to teach their students. The majority of these topics though, that is 83%, were related with recreation or involved tree/plant identification. Only 2% of all proposed activities involved some sort of ecosystem study and only 3% involved an investigation of human impact. The fact that the majority of teachers mentioned mostly recreation-related activities could be attributed to a more general lack of knowledge of environmental issues, which was not investigated in this study. Also, their willingness, motivation and preparedness to teach environmental education were indicated, albeit somehow indirectly, as teachers most often suggested that they needed background information, science equipment, a site visit, an expert to lead activities, field guides, lesson plans and extra staff. At the same time, teachers' general perceptions of environmental education were not shown as the study focused mostly on outdoor education using natural areas.

This study has a more qualitative character than a quantitative one. It used pictures in order to stimulate teachers' thinking and comments, and participants had the opportunity to express themselves freely and elaborate on the topics that came out of the discussions with the researcher. Simmons tried to detect the teachers' reactions to the pictures of natural areas, to find out what ideas they had concerning the use of these places in their teaching and to see whether they thought it was or was not possible to use them. Her results showed that teachers related natural areas mostly with excursions and recreational reasons rather than with conducting environmental education programmes. Even though more than half of her sample had training in environmental education, it was not shown in the research how this might or might not have affected their ideas. The statistics used in this investigation helped to quantify the categories that were created from the teachers' answers and had not been given a priori to teachers.

The current research is also engaged in examining the nature of environmental education. It too aims to discover how teachers might use natural areas in their teaching. The present research, though, does not insist on the use of particular natural areas but set out to detect how teachers think of taking advantage of their school's surroundings, which may or may not include natural areas.

Gayford and Dillon (1993-94) conducted research under the title of "Policy and the Practice of Environmental Education in England: A Dilemma for teachers".

The study's sample comprised 51 teachers from 28 secondary schools in the south of England. The schools where participant teachers were selected from were already involved in environmental education in some form or another.

The research project's instrument was a simple questionnaire. Teachers were asked questions concerning their personal awareness of and behaviour towards the environment, their attitudes to local and global issues and their training in values education. Also, their preparedness to engage in work on beliefs, values and attitudes was investigated, along with their awareness of international and local initiatives in relation to the environment. Finally, the study tried to detect the emphasis placed on environmental education in their schools, where it occurred in the curriculum and their views about where it should occur.

The findings of the research revealed that 90% of the teachers considered themselves to be environmentally aware, but only 43% reported that this environmental awareness was expressed through their behaviour and actions. The majority of teachers considered both global and local issues as important. All teachers said explicitly that in their teaching there was a balance between the knowledge and understanding of environmental matters and the values and attitudes they taught. However, only 12% had received professional training, which might help them to deal with values and attitudes. As far as their awareness of international and local activities were concerned, all teachers of the study had some contact with non-governmental organisations, mostly the large ones, whilst only 29% had connection with people from their local community or people working in local government. All respondents had heard of UNCED but few had heard of Agenda 21.

Finally, it was concluded from this sample that the most popular way of teaching environmental education was through subject teaching (62%), while 33%

stated that they taught environmental education through personal and social education programmes. Also, 49% of the participants stated that besides their main contributions to environmental education, they presented occasional assemblies, organised exhibitions or brought outside visitors into the school who could make an input to the theme they were investigating.

This study showed that secondary school teachers who came from schools that had some kind of commitment to environmental education, considered themselves to be moderately well-informed on environmental matters. They recognized the value of teaching the right attitudes towards the environment, but only a small percentage of them had professional training and few of them had a thorough knowledge of international initiatives. These results suggest that further research focused on schools that have no commitment to environmental education would be worthwhile.

Gayford and Dillon used a quantitative approach along with qualitative elements. They defined what they wanted to discover through their investigation and so they set a number of questions, which the teachers had to answer. The questionnaire helped them to collect teachers' answers in such a way that answers could be categorized and quantified.

This research can be related to both the first group of questions of the present research which referred to teachers' awareness of environmental education, and with the third group of questions which referred to teachers' general awareness of environmental issues. However, the present research interviewed teachers who came from schools where their commitment to environmental education was not known. Consequently, this study holds no expectations for particular answers.

Lane, Wilke, Champeau and Sivek (1995) conducted research which concerned the strengths and weaknesses of teachers' environmental preparation in Winsconsin. Their aim was to examine teachers' perceptions of the effectiveness of their pre- and in-service training in developing environmental education instructional competencies in relation to the 1985 mandate rule which required all teachers to have achieved environmental education competencies before they became qualified teachers.

The sample was selected from twelve different disciplines, the response rate was 59% and from this, 70% indicated that they taught about the environment. The

research questions asked teachers to what extent they felt that their pre-service training in environmental education helped them to use cognitive education methods, to use affective education methods and to teach environmental action strategies. The same questions were used in order for researchers to find out how the in-service training preparation in environmental education helped teachers to teach about the environment and use the aforementioned methods.

The instrument of the study was a 56-item list divided into five sections. literacy. It is worth noting that where teachers were asked to express opinions, Likert-type scales were used for the responses.

The results of the study showed that presumably, these teachers did teach environmental education; 18.2% had received pre-service training in environmental education and 30.5% had taken postgraduate or in-service courses in environmental education. For teachers who said that they did not teach environmental education (N=284), 8.1% reported receiving pre-service training in environmental education, and 11.5% indicated they had taken postgraduate courses in environmental education.

As far as pre-service training in environmental education was concerned, teachers' opinions of these courses were positive but when it came to the more specific components of environmental education, teachers were undecided as to the effectiveness of their training in cognitive education, affective education and environmental action strategies. Teachers that had pre-service training in environmental education also demonstrated better perception of environmental education competencies. However, approval of undergraduate environmental education courses did not seem to have a statistically significant relationship with teachers' attitudes towards environmental education and the amount of time that teachers devoted to teaching environmental education concepts. Teachers' perceptions of their training in each of the learning components of environmental education (cognitive, affective and behavioural components) and their perceptions of competencies in each area indicated that the weakest relationship was between their education in cognitive education methods and their competencies in this area. The strongest relationship was between their training in teaching environmental education strategies and their perceived competencies.

As far as in-service training in environmental education was concerned, teachers' opinions of these courses were positive. They considered these courses effective in teaching them about cognitive education methods, but not as effective in teaching them affective education methods and environmental action strategies.

Generally, the results of this research indicated that both pre- and in-service training in environmental education was effective and had positive consequences on teachers' perceptions of competencies of environmental education. However, this training needed to be more elaborate in specific areas, particularly concerning affective education methodology and environmental action strategies.

The character of this investigation is a quantitative one. It aimed to measure certain variables in teachers' pre- and in-service training in environmental education. It established causal links as it showed that training in environmental education methods contributed to teachers' perceived competencies in teaching about the environment. The sample size was large and so it helped to give generalisable results.

It can be argued that this research study is related to the present one, albeit in an indirect way. The present research also tried to define teachers' awareness of environmental education though without having a reference point, such as the 1985 mandate, to compare teachers' responses with.

Ballantine (1995) published a study entitled: "Evaluating the impact of teaching/learning experiences during an environmental teacher education course". The Queensland University of Technology offered an elective post-graduate course, which lasted for 14 weeks. The course was designed to: "*...develop professional rather than environmental content competencies... aims to encourage teachers to formulate a well-grounded, personal environmental ethic, develop an appreciation of and commitment to the need for environmental education in schools and adopt the use of progressive teaching practices in teaching "for" the environment*". Twenty-one students, both primary and secondary school teachers participated. Participants were asked to complete an open-ended questionnaire before and after the course and at the same time they were asked to keep weekly journals of their feelings and views during the course.

The course presented teachers with differing personal environmental philosophies, with the aims and content of environmental education, with ways of developing environmental cognition and learning, with the development of environmental attitudes and behaviour, with the design and use of interpretive learning experiences and with problems of teaching environmental education across the curriculum. The methods that the course used were: readings, case studies, simulations, group discussions, practical projects and debates.

The questionnaire that the students had to complete, before the course, aimed to gather data regarding students' environmental concerns and concepts of environmental education. Personal journals were kept which were used by the researcher to gain insight into students' reactions to the teaching/learning experiences used on the course. Three different categories of description emanated from the students' replies. For students' environmental concerns, there was the Egocentric, the Guardianship and the Ecocentric conception. The first was motivated by self-interest, the second by an interest in future generations and the survival of the planet and the third by the inherent worth that students attributed to the environment. The Guardianship conception was the prevalent one before and after the course was completed.

For the second question, which asked about their understanding of the term environmental education, three categories of responses were again formed. The first supported the teaching of environmental information, that is facts about the environment, about environmental problems and that their solutions should constitute the content of environmental education. The second category focused on the teaching of environmental issues and awareness. Students who fell in to this category emphasised the need for people to be aware of environmental issues and the consequences their behaviour has on the environment. Finally, the third category viewed environmental education as the teaching of environmental attitudes and behaviour. Prior to the course, 17 students thought of environmental education as the teaching of environmental information. After the course had been completed 16 students thought of environmental education as the teaching of environmental attitudes and behaviour. Thus, the importance of training in environmental education became very significant, as it seemed to broaden teachers' views on what constituted

environmental education. The training that these student-teachers had received, enabled them to realise that environmental education was not only teaching facts about the environment but also developing attitudes and positive behaviour towards the environment. The same happened with Papadimitriou's study of 1995. Teachers' views on environmental education changed after their training. They realised that environmental education was not only about knowledge transmission but also about action. Research studies (e.g. Spork 1992) have shown that education ABOUT the environment is more popular in school practice than education IN and FOR the environment. Hence, is it possible that lack of training could be one reason why this is so?

This was a qualitative study which investigated students' ideas about environmental education through open-ended questions and weekly journals. Hence, students were left free to express their views and feelings. It is evident that the course helped students to think of other forms of environmental education as well as to reinforce the beliefs they already held relating to environmental concerns. The study went on to give more details concerning the effect that the course had on the students' personal views about the teaching and learning relationship. The part of the study that has been presented, is the part that can be related to the current research. The present study also aims to investigate teachers' understandings of the term environmental education with a question that is articulated as straightforwardly as the one in Ballantyne's study. The instrument of the study is different, as the current one uses a semi-structured interview as opposed to the open-ended questionnaire and its sample comprises in-service primary school teachers who are more than 21 in number as opposed to the sample in Ballantyne's study.

Brijker, Jong and Swaan (1995) published a study entitled: "The need for support in secondary schools in the Netherlands in the implementation of environmental education". In 1993 environmental education was established as part of the secondary school curriculum in Holland and learning objectives were formulated for seven disciplines: biology, economics, geography, history, personal care, science and technology. These objectives were divided in to four groups: a) Relationship between man and the environment, b) Environmental problems and their causes, c) Solutions and d) Abilities.

They used a questionnaire, one for head-teachers and the other for the teachers of the disciplines listed earlier (e.g. biology, economics, history, etc.). The questionnaire consisted of two parts. The first part included general questions aiming to investigate what sort of information teachers had regarding environmental education, whether they were involved in it, how they practiced it, how they planned to implement it and what hurdles constrained its implementation. The rest of the questionnaire focused on the objectives of environmental education. Hence, it asked teachers to describe how often they would work within a certain objective, how much time they would spend on it, whether they would use support and, if so, what kind of support they preferred. This section of the questionnaire used Likert-type scales to measure the sample teachers' engagement with specific objectives and aspects of environmental education. The number of teachers who completed and returned the questionnaires was 327. From them, 15% were strongly involved in environmental education, 28% moderately involved and 57% had little or no involvement at all.

The results showed that the objectives from the first group (Relationship between man and the environment) received more attention than the second group (Environmental problems and their causes), while the two other groups (Solutions and Abilities) received less attention.

When teachers were asked to tick on a 4-point scale how much time they were going to spend in future on the various objectives of environmental education, 50% of them stated that they would spend less or the same time, 41% slightly more time and 9% much more time. The hurdles that prohibited them from implementing environmental education were: time constraints (47%), lack of materials (33%), obscure governmental rules (27%). What is notable is that 34-40% of the teachers admitted that they would certainly use support if it was offered, while 54% were unsure and 7-12% did not want support. From the percentage of teachers who would definitely use support, written information stood out (68%) as the aspect they would most appreciate.

This quantitative research investigated teachers' practices and ideas about environmental education. It used a Likert-type scale and a questionnaire which asked teachers to rate which objectives of environmental education they used the most,

whether they planned to change the amount of time devoted to environmental education, what major impediments prevented them from implementing environmental education in the school curriculum and what sort of support they wanted. The current study aims to investigate similar factors, though it takes a qualitative approach and is made up of a sample that comprised primary school teachers from two European countries, namely, England and Greece.

Papadimitriou (1995) published the results of a further study with the title: "Professional development of in-service Primary teachers in Environmental Education: an action research approach."

The sample was fourteen in-service primary school teachers who had a two year Teacher Training College Diploma. Environmental education was one of their options teachers took up, when they were accepted as part-time students in the Education department of the University of Thessaloniki.

Before the researcher actually started the participatory action research programme, it was considered important to investigate these teachers' ideas concerning environmental education and its practice. The results that came out showed that teachers were sensitive to environmental issues, that they taught environmental education because they loved the natural environment and they wanted to protect it, and that they felt all people should do what they can to save the environment. Furthermore, they held positive attitudes towards environmental education as they considered environmental education as important as other subjects taught. What was really significant to them was the transmission of knowledge about environmental issues, which would result in increased student awareness of the dangers facing the environment and consequently would lead them to adopt positive attitudes towards the environment. By the notion 'environment', most of them referred to the natural environment but few referred to children's immediate environment.

As far as practicing environmental education, they implemented it through discussions about environmental issues and through visits to different places (museums, factories, exhibitions).

The factors they claimed that inhibited them were the stubbornness of some head-teachers, the fact that if the children's fixed timetable was interrupted it might

have unpredictable consequences for their exams, the negative attitudes held by colleagues, lack of experience, no substantial support and a feeling of safety that derived from working in prescribed ways.

So, on entry to the course, these were the teachers' views concerning environmental education and its practice. After that, the project required that they became involved in action research and took initiatives in implementing environmental education programmes with their class. The methods used to collect data were detailed diaries, tape recordings, photographs, slides, children's work and oral reporting during the group meetings. There was also a final report that each participant had to produce. In addition, a facilitator was appointed whose role was to act as a kind of partner to the group, participating in the meetings and making suggestions for practical tasks the teachers might undertake with the children.

The study's results showed that teachers did not actually follow the classic action research model which is of a spiral planning, acting, observing and reflecting, but they tended to focus on implementing their projects in the curriculum and on the kind of activities which required their classes to be off the school premises. Nevertheless, their views on environmental education changed as they realized that environmental education was not only about knowledge transmission but also about action. They saw how children became involved in collecting data, in analysing that data, in collaborating and in communicating.

It is evident that this research belongs to the critical tradition. Not only did it show an interest in teachers' views and practices concerning environmental education, but it also tried to investigate how these views and practices were changed and modified within a certain school context by engaging teachers in a research project.

This piece of research focused on developing in-service training programmes in environmental education. Part of this investigation can be related to the present research in that it too tries to investigate teachers' ideas concerning environmental education and its practice. Instead of open-ended questionnaires, the researcher uses a semi-structured interview. The number of teachers who participated in the present research is bigger than Papadimitriou's study, which could hardly be described representative of the general Greek teacher population.

Simmons (1996) published a paper, which was based on results from a previous study she had conducted in 1993. That previous study dealt with teachers' perceptions of environmental education opportunities in various natural settings. The later study concerned itself with what teachers felt it is appropriate to teach in natural areas.

Both studies took place in the Chicago metropolitan area and comprised elementary school teachers. In 1996 Simmons interviewed 59 teachers using an 83 item questionnaire which had been developed based on the results of the previous study. The questions asked teachers to discuss the benefits of and barriers to using natural settings for environmental education, what sort of subjects (e.g. mathematics, science and language arts) were more appropriate for environmental education to be taught through, with what sort of activities (e.g. plant studies, listening and observation activities and reading) and what resource needs they had. The researcher conducted the interview with the help of four set of photographs portraying various natural settings which were: rivers, ponds and marshes, deep woods, country park and urban nature.

The positive feature that came out of this study was that the teachers perceived a wide variety of subjects as appropriate for teaching environmental education through. Unquestionably, science prevailed in certain settings, but other subjects, such as art proved to be as 'popular' in some other locations.

The activities that teachers suggested for the rivers, ponds and marshes and deep woods pictures included sketching or drawing, water studies, insect and plant studies, listening and observing. For the pictures of country park and urban nature, activities such as picnicking, sketching or drawing and recreational activities were mentioned and for the urban nature, work relating to the architecture had the highest mean score.

The question that Simmons had asked before conducting her research was whether teachers felt that environmental education was science-oriented even when the setting they were in was other than the classroom. The question was clearly answered as the teachers included various subjects as being appropriate to the understanding of the different natural settings.

This research has a qualitative character because allowed teachers to voice their thoughts and views on environmental education by photographs of a variety of locations. The current research did not give this opportunity to the teachers. It simply investigated if teachers have ever used such natural settings, what sort of settings they were and how they used them. It is more explorative rather than explanatory as far as natural and non-natural settings' use was concerned.

Yeung (1996) examined the teaching of environmental issues in school geography in Hong Kong. The questions he posed concerned environmental objectives that the teachers emphasised, their teaching styles, how these styles could be grouped into general frames and what was the nature of these groupings.

He conducted his study with a 22-item questionnaire, which investigated teachers' background, their views on environmental education, their perceptions as far as students' response to environmental education was concerned, the teaching styles/methods they used and the resources they made use of. The questionnaires were sent to 412 secondary schools and 208 teachers replied. Subsequently, 36 teachers were interviewed. They belonged to three different teaching style categories, which had been delineated from the questionnaire data and had expressed a willingness to be interviewed.

The results showed that most teachers (63.4%) were professionally qualified, that they had at least six years teaching experience and that few were members of an environmental or geographical association. Many of them exhibited just a general understanding of the inquiry method, they had many worries about their students' abilities to undertake fieldwork and to use maps and numeric data. The teachers' personal environmental concerns showed high levels, as 94.2% expressed a need for action-oriented TV programmes on environmental protection and 77.7% were willing to get involved in schemes such as recycling.

The teaching methods commonly used by the teachers were notes on the blackboard, exposition and simple questioning. Factual knowledge was emphasised over values. The teaching styles and emphases that teachers had were identified by a factor analysis of the responses on objectives, methods and use of resources. The results showed low frequencies in the factors of environmental objectives, teaching

aids or inquiry-oriented methods. The highest frequency was scored in the expository methods.

The researcher conducted this study with the aim of examining the teaching styles that teachers in Hong-Kong were engaged in. The teaching styles for geography and for environmental issues taught in geography were proved to be expository, based mainly on teachers' lecturing and students' taking notes.

The study has both quantitative and qualitative elements. The questionnaire, which was addressed to a large number of teachers, helped the researcher form three groups of teaching styles. Then he conducted semi-structured interviews with the teachers that were willing to be interviewed. The results of the questionnaire were reinforced by the interviews.

The current study also investigates the teaching styles that teachers believe to be most appropriate in the teaching of environmental education. However, the sample of the current research comprises primary and not secondary school teachers, hence it cannot be limited to the teaching of geography.

Robertson and Krugky-Smolska published in 1997 a study they conducted in Ontario, Canada, aimed at identifying the beliefs appertaining to environmental education held by three environmentally committed teachers. The actual title of their research project was "Gaps between Advocated Practices and Teaching Realities in Environmental Education". The main questions of the investigation concerned the participant teachers' beliefs about the environment, whether these views were represented in their environmental programmes and what factors either contributed to or prevented them from implementing their ideas into environment-related programmes of study.

The sample consisted of three environmentally committed teachers. An opportunistic sampling approach was used. The chosen teachers themselves had expressed an interest in participating, and also considered themselves committed to environmental education. Additionally, as there was one secondary and two elementary teachers, they offered the elementary-secondary school mix.

The main instruments for this study were open-ended, in depth interviews and classroom observations. Interviews, which usually followed the observations, were concerned with teachers' personal and professional influences, and the experiences

that shaped and explained their views and ideas about the environment. The research examined how these ideas were reflected in the environmental programmes that the three teachers undertook. They were also asked to describe past and current environment-related courses they had developed or taught.

The first teacher in the study was a secondary school teacher who had developed a grade 11 general level environmental studies course. This course, designed by himself according to his ideas and his students' needs, had three main components: the action component (daily collection of recyclable materials), the experience component (visiting landscapes) and the research component where students were engaged in finding information on various issues. Half of the interview time was devoted to the class events and the teacher's discussion of the students' behaviours. The other half focused on the course itself, on the teacher's personal interest in the environment, on how this affected his projects and on the other environmental activities in which he was engaged in school.

The second teacher was an elementary school teacher. Her personal interest in the natural environment prompted her to act as the teacher supervisor for the school's environment club that is responsible for monitoring recycling and composting at school, for organising environment-related activities, for introducing new environmental videos for students to watch. During the interviews the teacher talked about the origins and organisation of the club and about environmental education. She considered environmental education as a small overlapping piece of the global curriculum.

Finally the third teacher, another elementary school teacher, was an administrator at a kindergarten. She also organised an environment club and had set up a recycling and composting programme. She had established certain routines to ensure that the recycling and composting activities would continue even if she was not present. Her experience had taught her that success was best achieved by adopting 'one step at a time' approach. According to her, workshops and staff training sessions could be used to introduce other teachers to environmental education, which she regarded as an integral part of global education.

From all three accounts, it became evident that teachers' involvement in environmental education stemmed from their personal concerns for the environment.

Their environment-related activities derived from their own beliefs, knowledge, skills and teaching experiences, rather than from formal training in environmental education. All three teachers emphasized the action component and realized how time schedules and materials could inhibit their activities. Also, it was apparent that the action programmes needed specific activities and a consistent schedule in order for projects to be successful and accessible to students, even though all three teachers emphasized that, in their views, environmental education designing and maintaining certainly did not consist exclusively of such specific repeatable routines. Another finding of the study revealed that all three teachers organised their environment-related activities according to their students' needs, capabilities and interests. This is an issue, which is not mentioned by the other researchers into environmental education. That is, the focus is mostly on the content and the method used in environmental education and not on the people involved in it. The first teacher, for example, stated clearly that the course he had designed was prone to changes which emerged from his students' needs and interests. This rationale explains how externally sourced, specific curriculum packages on environmental issues do not always succeed unless teachers adjust them to take into account the level their class is working at, and their particular interests.

This study was conducted using a qualitative approach. The class observations and the open-ended interviews allowed researchers to find out what these teachers thought about environmental education. The sample was small, but the research lasted over a period of 12 weeks and the researchers gathered more than 25 hours of tape-recorded data. They examined closely the teachers' practices and ideas about environmental education by spending a lot of time with each teacher, something which is impossible to do when the sample is large and there are time and financial constraints. The investigation did not give generalizable data but it did try to reflect an indicative picture of environmentally committed teachers' practice of and ideas about environment-related issues. It showed how teachers committed to environmental education still faced problems concerned with the content and practice of environmental education in school. Environmental education took place in their schools because they felt it was important that it should. They based their projects on their personal experiences and ideas, and used a wide variety of materials

and resources originating from the media as well as other sources they discovered for themselves.

This study can be related to the current research project as the latter also intends to find out what teachers think about environmental education without limiting the sample to particular dimensions and aspects of environmental education. It aims to discover ideas and practices of environmental education that take place in primary schools in two European countries through semi-structured, open-ended interviews with teachers. The picture drawn from the investigation in these two countries will help to establish a broader idea of what teachers think about environmental education.

Palmer, Suggate, Bajd and Tsaliki (1998) published part of a major international study entitled 'Emergent Environmentalism'. This project investigated significant influences on the development of adults' environmental awareness and refers to the findings from three European countries, namely the UK, Slovenia and Greece. More detailed data emanating from UK was reported in another paper published in 1996 by Palmer and Suggate (Palmer and Suggate, 1996). For the purpose of the current study this literature review will present only the results from the UK and from Greece.

An outline of the study and its aims was given to participants. The sample of the study comprised environmental educators, i.e. people currently involved in delivering environmental education. Their environmental awareness was confirmed by a questionnaire they were asked to complete. This questionnaire included a list of seven possible activities relating to pro-environmental behaviour and the participants were asked to indicate those in which they regularly engaged.

The researcher asked the participants to give an autobiographical account in which they identified influences and experiences that led to their environmental concern. Moreover, they were asked to state what they considered to be their most significant life experiences and if they had any memorable years in terms of the development of their environmental thinking and awareness.

The data from both the UK and the Greek autobiographical statements were analysed and led to 33 categories (indicating single factors) of response, which then were refined into 13 grouped categories. These grouped categories were: outdoors,

education/courses, parents/close relatives, work, organisations, media, travel, 'negative' books, having children, pets, religion and others. For the Greek sample, such categories were: 'negative' books, childhood experiences of nature, respondents' work, media, education, people and adult experiences of nature. For the environmental educators from the UK the category of 'experiences of nature/outdoors' was ranked first, while the Greek environmental educators ranked that category second. The category they ranked first was the one called 'negative' referring to pollution, to the negative effects on towns and on health, to the development plans and to the tree clearing.

Results from other participant countries were similar. Palmer (Palmer et al. 1998) described the results from nine countries, namely UK, Slovenia, Canada, Hong-Kong, Uganda, Sri-Lanka, Australia, Greece and South Africa. The groups of influences mentioned by all respondents from these countries were: Experiences of Nature, People, Education, Negative Books, Work and Media. Palmer et al (1998) wrote that:

> *"...it is clear that direct experiences of the natural world affected over half the respondents and was the most influential group of factors. The effects of people, education and negative experiences were comparatively similar, being mentioned by between 38 and 40%."* (p.453)

The research project went on and analysed the data further finding out what were the single factors that most influenced these environmental educators' lives, and made comparisons among different age groups and among different nationalities. Since the current research can be related only to the part of the study already presented, it has been determined that further information relating to the results of the study was not required. The grouped factors that have been formed and have shown the formative experiences of environmental educators are to be compared with the categories that the present study delineates. The present study asks teachers, whose environmental awareness and commitment is not known, to describe the sources of their environmental knowledge and also, to comment on the formal and informal sources of that environmental knowledge. It is evident that the samples of the two studies do not share similar characteristics, but it should be

interesting to identify what sources and experiences influence the environmental knowledge of the teachers involved in the current study.

Agyeman (1998) published a study in England which was initiated by the native-alien plant debate. He wanted to investigate whether Key Stage 2 teachers were aware of this debate and how it affected their teaching of wildlife.

Questionnaires were sent to 60 Urban Wildlife Groups (UWGs) and to the head-teachers of 464 urban primary school in England. The school's sample was deliberately selected to be made up of 50% who were known to be aware of urban nature and conservation issues. These schools were drawn from the English Nature database. The researcher felt that such schools should be included because the questionnaire of the study was a "*...technically demanding...*" one.

One hundred and ten school-questionnaires were returned and 55-UWGs questionnaires. The results from the school-questionnaires showed that 50.5% of the teachers felt confident in teaching about urban nature and 98% of the schools undertook local, nature/ecological studies. The popular settings that teachers used were the school nature garden in combination with the local park (31%), local woods (28%) or the local nature reserve (26%). Wasteland sites were not as popular. The local wildlife trusts were not used much by teachers (67%), only 33% of responders admitted consulting them. Similarly, urban nature resource parks were not greatly used (59%). As far as the division between alien and native plants was concerned, 43% of the teachers felt that this division is useful in educational terms, while 25% either did not think so or they did not know (32%). The majority of teachers (58%) did not make a distinction between native and alien plants in ecological/nature studies. However, the majority of teachers have either read (36%) or have been advised (24%) on that distinction which claims that native plant species are better for wildlife than aliens. Finally, teachers were asked to comment on some descriptions of alien plants as 'villains' 'barbarians' and 'encroaching foreigners'. Teachers' comments varied reflecting both concerns at the anthropomorphism of ecology and the technical accuracy of the terms.

This study followed a quantitative approach. It investigated a certain issue, which concerned the debate between native and alien plants and how this debate was reflected, if it was reflected, in Key Stage 2 schooling. The questionnaires they used

for both teachers and the UWGs included mostly closed-ended questions. Its sample size was fairly large and the researcher's aim was to: "*...allow the quantitative component to map out general patterns*".

The current research does not aim to map out general patterns concerning primary school teachers' views on environmental education. As far as the debate between alien and native plant species was concerned, the present study can only detect whether teachers mention something of that kind on their own. There is no stimulus for prompting such a discussion. Teachers are asked to discuss the content of environmental education in the primary school curriculum and that may instigate references to that debate. Agyeman thought it useful to include schools who were known to be aware of urban nature and conservation issues to facilitate teachers to respond to his questionnaire concerning the debate. Taking that into consideration, it is unlikely that the current research will produce any data pertinent to that issue.

Cross (1998) examined how teachers perceived the term sustainable development, how their views were reflected in their teaching and what they saw as their responsibility as teachers. This research interviewed secondary school teachers from Scotland and from the USA. A semi-structured interview was used to allow teachers the freedom to discuss the questions at length.

All of the teachers interviewed had become aware of sustainable development through the print or visual media and through their own reading. The first question asked teachers to discuss what they understood by the term sustainable development. Population and resource consumption were teachers' major concerns, but all teachers acknowledged the complexity of the term sustainable development. The second question brought up the issue of conflict between the concepts sustainability and development. Teachers acknowledged that development should have limits, but no one was able to elaborate further. Then teachers were asked to 'interpret' sustainable development with regard to consumption and to quality of life. Relating to consumption, a typical answer included the way resources were used both in the 'North' and in the 'South' but no connection was made between the current goods and services economy. As far as quality of life was concerned, answers reflected the connection between lifestyle and consumption and Cross included a teacher's reply which expressed the opinion that society should start measuring its wealth not only

in economic terms but in social and environmental ones as well. Teachers considered that if students were taught conservation issues, then their attitudes would change, hence society would change. Science and technology were the means that could achieve sustainable development according to the teachers. There was no consensus as to how this could be done, but many teachers felt it was a matter of finding the funding. The question that caused the most discomfort was the one concerning the ecological state of the planet. All teachers acknowledged that the situation was not good and at the same time recognised that they did not know how to handle this professionally. This was also shown when they were asked to discuss what sustainable development meant for education. They considered that all problems concerned with the state of the planet were external to schooling. For instance, teachers talked about political changes and revolution. Education, they thought, could not deal with sustainable development on its own. It would take a lot more than that. However, teachers perceived their role as agents of social change but again discussed the limitations they had within the curriculum in which they had to work. When they were asked if they had opportunities to change social values and attitudes towards sustainable development and how they could do such a thing without being pessimistic, teachers said that there were opportunities to raise students' environmental awareness without stressing the negative aspects of it. They stressed that selfishness needs to be aborted and that they should not make students feel frightened and hopeless. This encapsulated a major problem for many teachers. How is it possible to teach environmental education without destroying students' hopes?

This is a qualitative study which interviewed teachers and allowed them the freedom to respond to the questions at length. The current study can be related to the above as it also asks teachers about the environmental literacy of the world in which we live. Cross asked teachers to discuss the ecological state of the planet, while the present research asks teachers to discuss the environmental literacy of the world. The questions posed are not the same. However, the teachers' answers given in the current study reflect the ecological state of the planet when discussing whether people in developed or developing countries were environmentally literate or not and why. Moreover, the role that the school plays in creating environmentally literate societies is also discussed in the current study. Cross asked teachers to discuss how

sustainable development can be achieved in school. Both questions tried to detect how teachers perceived their role and the school's potential in promoting positive environmental behaviour.

Ballantyne (1999) reported the results of an international study which aimed to explore the attitudes of geography teachers regarding the place of environmental education within geography, to identify the hurdles and the facilitating factors for the teaching of environmental education within geography, to investigate the different methods employed and to determine to what extent geography teachers feel competent and prepared for the teaching of environmental education.

He used a questionnaire which comprised response statements and closed-ended questions. His sample came from 18 countries.

Respondents were asked to rate the importance of teaching aspects of environmental education in geography lessons. The most popular commonly cited aspects related to the development of environmental awareness, of environmental knowledge/concepts and to the attitudes and behaviour explored through geography teaching. Least support was shown for encouraging active commitment to environmental causes. The first three aspects identified from the UK teachers were the teaching of awareness, concepts and issues. Environmental knowledge, responsible environmental behaviour and environmental attitudes and values were other three aspects that teachers gave a large degree of commitment as well. Least commitment was expressed for promoting active involvement in local environmental issues. There was strong support for environmental education in geography education, as 78% said that environmental education should comprise at least half of geography lessons and 40% believed that it should be included in the majority of the lessons. Most respondents (83%) supported the idea of promoting an environmental ethic. Teachers from the United Kingdom (62%), Japan (61%) and Namibia (60%) were the least committed to that.

The research also gave three statements to the teachers, who were asked to indicate whether they agreed or disagreed with them. The first stated that the aims of environmental education and geography education were similar. Respondents agreed with this and while there was no any major disagreement in general. The second statement reported that courses in 'Geography and Environmental Education' should

replace 'Geography' courses in schools. Most respondents disagreed with this statement. Less than 15% of geography educators agreed with the idea of formally incorporating environmental education into geography. This is worth noting since 78% had reported that environmental education should comprise at least half of geography lessons. The third statement said that environmental education should be taught in all subjects across the curriculum. Over 90% agreed with that statement.

The obstacles that were rated as most important in limiting the teaching of environmental education through geography were: time constraints, personal heavy workloads and lack of knowledge and training in environmental education. Teacher educators regarded the lack of knowledge and training as the major obstacle rather than time and workload. On the other hand, the facilitating factors for enhancing the incorporation of environmental education in geography classes were: field trips, videos and teacher education (pre-service, in-service and at post-graduate level).

The methods most widely used by teachers were: teacher presentation, class discussion, videos and worksheets. Other methods mentioned were textbooks, student projects, small group discussions.

Finally, the majority of respondents (61%) considered that their pre-service training had not prepared them well for teaching environmental education. Personal reading and videos/films were more likely to have contributed to respondents' knowledge and skills in environmental education, while the least likely were in-service courses and curriculum guides.

This study showed that geography teachers and teacher educators clearly supported the inclusion of environmental education in geography classes and they also supported its inclusion in all other subjects of the curriculum. That said, they did not want to replace geography with one course that incorporated both geography and environmental education. They mostly applied teacher-centred methods such as teacher presentations and class discussions in teaching environmental education through geography. Time constraints, heavy workloads and lack of knowledge were the main factors that prohibited them from teaching environmental education.

This quantitative study that comprised response statements and closed-ended questions, can be related to the current one as it also investigates teachers' awareness of environmental education and how it could be best implemented and taught in

schools. The difference lies in the subject that the teachers taught. Ballantyne's research used geography teachers and teacher educators. The present research uses primary school teachers. Ballantyne's results showed that teachers involved with geographical studies faced problems when it came to teaching environmental education. That is something which may prove that environmental education is not only geography-related but it also instigates an interesting question for teachers with no background in geographical studies. If geography teachers felt that they were not well prepared to teach environmental education, what happens with teachers whose studies are other than geographical? The present study attempts to investigate the extent to which primary school teachers consider environmental education to be a subject which should stand on its own, whether it should be present on the curriculum in another form, what sort of teaching methodology could be employed in teaching environmental education and what aspects of environmental education teachers believe they should teach. All the aforementioned are investigated by Ballantyne's research. The current study aims to do the same using a qualitative approach and a smaller sample.

4.2 General characteristics of research studies in the field of environmental education.

The majority of the research projects described above were quantitative ones (Mirka 1973, Jaus 1978, McCaw 1979, Schwaab 1982/83, Spork 1992, Lane, Wilke, Champeau, Sivek 1992 and 1995, Gayford and Dillon 1993/94, Brijker, Jong, Swaan 1995, Agyeman 1998, Ballantyne 1999) which aimed to measure variables and aspects of environmental education that they were investigating. Such factors were: outdoor/indoor activities, use of natural areas, use of instructional methods and their effect on teachers and rating the importance of facilitating and prohibitive factors in teaching environmental education. They tended to give causal relationships, which justified or simply explained certain behaviour that teachers demonstrated. Their main interest was focused on particular forms of environmental education, for instance study trips, outdoor/indoor activities and by examining these activities they also aimed to identify how teachers viewed environmental education generally. Qualitative research projects were those of Ham and Sewing in 1987/88, of

Papadimitriou in 1992 and in 1995, of Simmons in 1993 and in 1996, of Robertson and Krugky-Smolska in 1997 and of Cross in 1998. Some other studies, such as those of Dorion and Gayford in 1990/91, of Ballantyne in 1995 of Palmer, Suggate, Bajd, Tsaliki in 1998, of Palmer and Suggate in 1996 and of Pui-ming Yeung in 1996, had both a quantitative and a qualitative character.

Another feature of this literature review showed that seven of the research projects had a sample of elementary school teachers only (Mirka 1973, Ham and Sewing 1987/88, Dorion and Gayford 1990/91, Spork 1992, Simmons 1993 and 1996, Papadimitriou 1995 and Agyeman 1998). Quite few others used secondary school teachers only (Papadimitriou 1992, Lane, Wilke, Champeau and Sivek 1992 1995, Gayford and Dillon 1993/94, Brijker, Jong and Swaan 1995, Pui-ming Yeung 1996, Cross 1998 and Ballantyne 1999). A mix of teachers from various school levels was used in the studies of Jaus in 1978, of McCaw in 1979, of Schwaab in 1982/83, and of Robertson and Krugky-Smolska in 1997. However, only one study that of McCaw's (1979), made any distinction between the various school levels when they presented their findings.

It should also be noted that the ratio of research projects on environmental education relating to teachers undertaken in Europe is nowhere near as large as the number of studies conducted in United States (Mirka 1973, Jaus 1978, McCaw 1979, Schwaab 1982/83, Ham and Sewing 1985, Lane, Wilke, Champeau and Sivek 1992 and 1995, Simmons 1993 and 1996 and Cross 1998). Other locations where research has been carried out were 1 in Canada, 2 in Australia, 2 in Greece, 3 in England, 1 in Hong-Kong, 1 in the Netherlands and 2 projects which were international.

A number of studies (Dorion and Gayford 1990/91, Papadimitriou 1992, Simmons 1993 and 1996, Gayford and Dillon 1993/94, Robertson and Krygky-Smolska 1997, Palmer 1996 and 1998) included environmentally committed teachers. Their positive attitudes towards and awareness of environmental matters and environmental education were presupposed. Such a fact shows that the researchers were, primarily, interested in the issues and in the methods used for delivering environmental education in the school curricula. Environmentally committed teachers certainly have much to say on environment-related issues and on

the methods they use to teach these issues. However, it is interesting to see how non environmentally committed teachers discuss environmental education.

The present research placed emphasis on teachers' views concerning environmental education. It did not aim to test a certain variable or aspect of environmental education and the way it influenced teachers' knowledge and practice of environmental education. For instance, Mirka (1978) examined factors relating to the use of outdoor activities use and Simmons (1993) examined the use of natural areas in the teaching of environmental education. Instead, the current research project focused on the ways in which teachers perceived environmental education through their studies, their interests and their experiences as teachers. The sample was not selected according to the teachers' personal commitment to environmental education. Schools were randomly selected in order to provide a true representation of the general population. This random sampling provided data on teachers' beliefs regarding practices in environmental education and presented the opportunity at the same time to estimate the number of teachers who were environmentally committed compared to the number of teachers who did not consider themselves to be so. Even more interesting would be if, for example, results indicated differences in the environmental commitment of teachers in the same school where they shared the same curriculum policy. Every teacher may possess a distinct idea of what environmental education is and what its practice entails. These distinct ideas are better examined when teachers and not environmental issues and methods become the focus of a research project. That is what this study aimed to do -to put teachers, primary school teachers in particular, at the centre of the investigation- and to find out their distinct ideas. The research projects in environmental education that were presented in this literature review, concentrated on the content and methods of teaching environmental education, rather on the people who participated in it.

Thus, this investigation attempted to describe primary school teachers' awareness of environmental education in two countries, namely England and Greece. So far, there has never been a comparative study between England and Greece which focused on environmental education and teachers' awareness of it. The comparative character of the study will, hopefully, give an indicative picture of influences upon primary school teachers' awareness of environmental education, and

the quantification of the categories, created by the teachers' answers, will establish a comparative and holistic explanation of the way teachers envisage environmental education.

5. CONDUCTING EMPIRICAL RESEARCH: PARADIGMS AND METHODOLOGY.

Paradigms in research help researchers organize and conduct their investigations according to certain philosophical stances and based on a certain way of collecting and analysing data. Such research paradigms are referred to as the positivist or quantitative, the interpretive or qualitative and the post-positivist. The first two have been the most prevailing research paradigms. The third is a paradigm that, it could be argued, stemmed from the differences between the two.

This chapter describes these research paradigms and their characteristics. It also attempts to discuss their origins from an historical and a philosophical perspective. It goes on to outline the various methodologies and study instruments that each research paradigm uses in order for investigations to be carried out. Despite the differences that exist among the research paradigms, it is possible to combine different methodologies (quantitative with qualitative) and have a paradigm of choices which is also discussed later in this chapter. Finally, the chapter concludes by describing the methodology and the instrument adopted by the current study, justifying these choices based on the characteristics of the paradigm that best suited the aims of the study.

5.1 The Positivist Paradigm.

Positivism is a philosophical theory and its origin is attributed to August Compte (Kolakowski, 1972). Compte thought that science would help man control natural and social life. Knowledge in metaphysical fields, he proposed, can never be used practically. The positive mind asks how phenomena occur and is interested in facts. The observation, experimentation and calculation of these facts lead scientists to universal laws. The basic belief of this philosophical stance is that genuine knowledge is the knowledge which comes from sensory experience. That is, in the world there are phenomena which can be discovered and examined using observations and experiments. Positivism thus seeks empirical evidence in order to acquire reliable knowledge. Reliable knowledge is that which can be verified and confirmed by observation. With positivism there is no distinction between 'essence' and 'phenomenon'. Whatever researchers observe, is what they record. Statements

that go beyond the domain of experience create confusion and do not have real value because they do not correspond to reality. At the same time, the philosophical stance of determinism claims that all events have causes and that is how events can be explained as they are determined by previous circumstances. The connection between cause and effect can only be discovered by experience, never a priori. The main aim of positivism is to explain phenomena and to establish causes and effects. By explaining phenomena, generalizability can be achieved. Scientists who know the reasons why and how phenomena exist and act, are also able to predict them, control them and form universal laws. Thus, what is true in one time and place may also be true in another time and place. Kolakowski (1972) said, when he wrote about positivism:

> *"...positivism is a collection of prohibitions concerning human knowledge, intended to confine the name 'knowledge' or 'science' to the results of those operations that are observable in the evolution of the modern sciences of nature. Throughout its history the particular concern of positivism has been to turn a polemical cutting edge to metaphysical speculations of every kind, and hence against all reflection that either cannot found its conclusions on empirical data or formulates its judgements in such a way that they can never be contradicted by empirical data."* (p.18)

During medieval times Bacon (Kolakowski, 1972) asserted that experimental and geometric deduction are the only reliable means of acquiring knowledge. Later on, Leibnitz and Descartes (Kolakowski, 1972) claimed that knowledge which is inaccessible through empirical investigation is absurd. Coming to the period of Hume, Kolakowski (1972) said:

> *"...all judgements concerning matters of fact, in contrast to mathematical propositions, tell us something about existence: they assert the presence of a certain event, but at the same time they imply no kind of necessity."* (p.45)

That is, apart from mathematics which are indubitable and self-evident, all other observations have an empirical character. If they lose this character, they will not tell us anything about this world.

The Enlightenment period sought to establish knowledge based on empirical premises and systematic studies of the natural, physical and social environment,

leaving out metaphysical constructions. One of the thinkers of that period, D'Alembert (Kolakowski, 1972) believed that true knowledge stems from impressions and that the mathematical sciences help to symbolize these impressions.

In the 20th century, between the two World Wars, 'logical empiricism' made its appearance. This new term is a combination of the positivist current and the analytical school. According to the analytical school, meanings in every field should initially be examined through the logical analysis of language. Dominant features of logical empiricism are: a) the idea that reliable knowledge is the knowledge that is accessible to all, b) that the way people can reach knowledge is by mathematics and natural sciences' methodology and c) that it is characterized by an anti-metaphysical attitude.

From the above philosophical stances derive the positivist research paradigm which aims to describe, to explain and to measure phenomena the way they appear. According to this paradigm, knowledge is viewed as objective and tangible, as something which already exists 'out there', which is external to the individual. Thus, scientific investigation will be oriented towards finding and analysing the relationships and regularities of the phenomena that occur. Their identification and measurement are of primary concern to scientific research. That is why this scientific research employs primarily quantitative techniques.

The positivist or quantitative paradigm is applied to both natural and social sciences. According to it, human behaviour should be investigated by the methods of natural science since every human action is a response to an external or internal incentive; that is, there is a cause which provokes this specific behaviour. Research is conducted from the 'outside', meaning that researchers are trying to investigate the phenomena relying mostly on the society's structures, facts and on what is 'out there'. They are not concerned about the individual himself and how he perceives the world.

5.2 The Interpretive Paradigm.

A second paradigm is known as interpretive or qualitative. The basic difference between the positivist paradigm and this is that the interpretive paradigm is characterised by a concern for the individual. That statement, though, does not mean

that interpretivists do not care for social structures and facts. They do. However, their research is conducted from 'inside', meaning that they try to explain phenomena by considering the way in which individuals live and experience life.

It can be said that this paradigm stems from a philosophical movement known as Existentialism. The Danish philosopher, Kierkegaard, from whose work existentialism originated, was concerned with the individual and his need to reach the highest level of development. Kierkegaard wanted to free people from 'objectivity' as he considered this to be one of the major illusions people hold. Cohen and Manion (1989) stated that by 'objectivity' illusion, Kierkegaard:

> *"...meant the imposition of rules of behaviour and thought, and the making of a person into an observer set on discovering general laws governing human behaviour."* (p.24)

Regarding 'objectivity' illusion Kierkegaard suggested that 'subjectivity' should be regained. 'Subjectivity' is concerned with the individual's own perceptions and ideas of the world. Individuals also create theories about themselves and the world, acting and reacting accordingly. It is for this reason that researchers should be interested in individuals too.

This approach was also supported by the Chicago school sociologists. Their research was based on first-hand data. A study entitled "The Polish Peasant in Europe and America" by Thomas and Znaniecki in 1927 has been of a major importance to sociological research because it was based on personal and public documents. The analysis of this data introduced new techniques unfamiliar to empirical investigations used at that time. The Chicago sociologists also placed an emphasis on city life. Studies that have been conducted by them, such as "The Jewish ghetto" by Wirth in 1928, "The boys gang" by Thraser in 1927, "The professional thief" by Sutherland in 1937 and more, show that they placed great importance on the contexts in which their studies belonged. Bogdan and Biklen (1992) claimed that:

> *"In this emphasis on the intersection of social context and biography lies the roots of contemporary descriptions of qualitative research as 'holistic'."* (p.12)

Phenomenology, ethnomethodology and symbolic interactionism are three theoretical frames of the interpretive paradigm, which apply in sociology. All these three movements are concerned with phenomena, with what people perceive through their senses and experiences.

In phenomenology researchers are interested in the world of everyday life. In order to conduct the investigation researchers take account of the social context and depend on typification in which, according to Cohen and Manion (1989),

> *"...the observer makes use of concepts resembling 'ideal types' to make sense of what people do. These concepts are derived from our experience of everyday life and it is through them... we classify and organise our everyday world."* (p.32)

Ethnomethodology is also concerned with the world of everyday life and more specifically how people perceive the world within a certain context. Researchers rely on the language people use, on their actions and on the assumptions that they make in their environment. Cohen and Manion (1989) explained:

> *"Ethnomethodology thus seeks to understand social accomplishments in their own terms; it is concerned to understand from within."* (p.33).

Symbolic interactionism underlines mostly subjective meanings and symbols which people use in order to express these meanings. Thus, symbolic interactionism is concerned with the fact that people inhabit two worlds, the natural and the social. In the natural world man is an organism who lives according to his biological functions but in the social world man has to use symbols to give meaning to objects and to his life with others. Cohen and Manion (1989) claimed that:

> *"Interaction implies human beings acting in relation to each other, taking each other into account, acting, perceiving, interpreting, acting again. Hence, a more dynamic and active human being emerges, rather than an actor merely responding to others."* (p.35)

The central belief of the interpretive paradigm is to investigate the subjective world of human experience. Researchers work from people's experiences and form theories which are 'grounded' in the data they generate. The method of investigation

is also called qualitative, as its primary aim is to understand the different realities of different social contexts.

5.3 The Post-Positivist Paradigm.

The third research paradigm is the post-positivist paradigm, also called the paradigm of naturalistic inquiry. The first name of this paradigm (post-positivist) demonstrates how this paradigm has been developed and it has gone beyond the positivist one. Its second name (naturalistic inquiry) demonstrates its connection to the interpretative paradigm and it brings to mind inquiry that is not experimental and that takes place in a natural setting.

With the positivist paradigm, reality is one, it is tangible and can be fragmented and studied independently. The relationship between the researcher and the object or subject under study is independent. For every effect there is a cause, which can be identified, examined and generalised so that researchers can develop theories which apply to other circumstances as well.

With the post-positivist paradigm one may find the exact opposite characteristics. Hence, according to it, there are many realities that depend on the social context which they refer to. It is not possible to break up realities in order to investigate them. They can only be studied holistically. The relationship between the researcher and the object(s) or subject(s) under investigation is interactive and inseparable. Its aim is not to generalize and form universal laws but to describe the cases of multiple realities and understand how they function in different social contexts. It does not distinguish causes from effects since both these phenomena take place at the same time. Finally, the methodology and the approach to a topic selected for a study have to do with the values of the social context, with the values of the researcher and the values of the subjects under investigation.

Lincoln and Guba (1985) said:

"Objective reality has become very relative indeed!" (p.30)

Commenting on this paradigm they also said:

"...[it] takes a deeper look...[it] is structural...[it] establishes meaning inferentially...[it] is concerned with understanding...[it] is probabilistic and speculative." (p.30)

On the other hand it has many similarities with the interpretive or qualitative paradigm. Such similarities are the natural settings where the investigation takes place, since realities are wholes which take their meanings from their contexts, and the human instrument. No other instrument than humans is more capable of conducting such research since they can perceive the variety of realities and understand the meaning of all interactions that take place. In addition to that there is tacit knowledge (intuition), which can be perceived only by humans and is used in comparison with the knowledge that is being expressed in language form. Also, both paradigms (interpretive and post-positivist) use mostly qualitative methods, which are more sensitive and adaptable to multiple realities and prefer purposive to random sampling. Purposive sampling increases the range of data exposed. Neither of the two paradigms construct theories a priori, but both favour those theories that are grounded in the data they generate. It is logical since, as Lincoln and Guba (1985) said,

"...no a priori theory could possibly encompass the multiple realities that are likely to be encountered." (p.41)

Also, both paradigms (the interpretative and the post-positivist) do not aim to generalize laws but to achieve results, which make sense both to researchers and to the object(s)-subject(s) under investigation. That is why they place great importance on the interaction between them. Subsequently, it is obvious that a broader application of their findings is limited. As Lincoln and Guba (1985) said:

"...the extent to which the findings may be applicable elsewhere depends upon the empirical similarity of sending and receiving contexts." (p.42)

In spite of the similarities with the interpretive paradigm, naturalistic inquiry is a new paradigm and the term naturalistic inquiry can be used, as Tesch (1990) said:

"...[as] a term parallel to the term qualitative research." (p.43)

Even though there are researchers who simply consider naturalistic inquiry as part of the qualitative paradigm, naturalistic inquiry is a new paradigm which emphasizes the human as instrument. The human is the major form of data collection device and has to operate effectively. The focus of the naturalistic inquiry is on understanding the meaning that people under investigation give to their experiences.

5.4 Methodology.

Methodology is the frame within which researchers design their study defining a general approach to the topic in which they are interested. It is also the theoretical base of principles, ideas, concepts which the researcher uses to justify the various methods employed to generate data on his/her topic.

5.4.1 Quantitative methodology.

The quantitative research model is that which is commonly used within the natural sciences, such as biology and physics. Natural sciences consider as valid the knowledge that stems from experience, from observing and from conducting experiments, whereby the researcher can determine variables and intervene in the experiments' sequence. It tends to generalize and test hypotheses and theories that have already been formulated. Its aim is to produce laws, which explain phenomena. In this way researchers render themselves capable of anticipating phenomena, of predicting their frequency, hence controlling them. That is why quantitative researchers often focus on large amounts of data. Only by having tested and analysed large amounts of data can they proceed towards generalizations and the establishment of theories. Hitchcock and Hughes (1995) when they discussed quantitative methodology in social sciences claimed that:

"...as positivism developed in social sciences two central principles of social research began to emerge. The principles of 'deductive reasoning' and the principle of 'falsifiability' became the hallmarks of what is described as the scientific method. The deductive reasoning suggests that it is possible to move from general kinds of statements to particular statements which can be, in fact, objective and independent of experience. Falsifiability means that scientists must

do two things: 1) they must frame their theories in a way that leaves them open to falsification and 2) they must be prepared to disregard such theories if they are not open to falsification per se or they prove wrong in the light of falsifying evidence." (p. 22)

So the primary concern of quantitative research is to measure, to quantify, to analyse and to test data in order to give explanations, to test correlations between variables and to develop general laws which can be applied to the world. As Creswell (1994) said:

"In quantitative research the objective is to test or verify, rather than to develop it. One thus begins the study advancing the theory, collects data to test it, and reflects on where the theory was confirmed or disconfirmed by the result in the study. The theory becomes a framework for the entire study, as organizing model for the research questions or hypotheses and for the data collection procedure. The researcher tests a theory by using hypotheses or questions which, in turn, contain variables that are measured by using items on an instrument." (p. 87, 88)

In the natural sciences, it is easier for a researcher to understand how experiments can be conducted, how scientists may intervene in their sequence and how important accurate repetition is for the experiment's validity. Continuing accurate repetitions lead scientists to the formation of generalizations and theories.

Research approaches in the quantitative paradigm include experimental research, survey and ex post facto research.

5.4.1.1 Experimental research.

With experimental research there is a preconceived plan, according to which certain variables will remain intact and others will be deliberately manipulated. By doing so, researchers try to see what the effects will be. There are dependent and independent variables. Independent variables are the ones which remain intact. They characterize and classify the stable elements of the study. Dependent variables are the variables which are affected by the independent ones. Researchers thus attempt to explain how and in what degree dependent variables have changed in comparison with independent variables. According to Creswell (1994):

> *"An experiment tests cause-and-effect relationships in which the researcher randomly assigns subjects to groups. The researcher manipulates one or more independent variables and determines whether these manipulations cause an outcome. The researcher tests cause and effect because theoretically, all (or most) variables between the manipulated variable and the outcome are controlled in the experiment."* (p.117)

Thus, experimental researchers observe the changes that occur in the dependent variable concurrently with the action of the independent variables, otherwise called treatment conditions.

Wiersma (1986) gave eight criteria for a well-designed experiment. These criteria are: adequate experimental control, lack of artificiality, basis for comparison, adequate information from the data, uncontaminated data, no confounding of relevant variables, representativeness and parsimony.

The first criterion of adequate experimental control refers to the fact that an experimental design is planned and structured in such a way that helps researchers trace the causes and interpret the results.

Lack of artificiality is concerned with the generalizability of the results. To achieve generalizations researchers should eliminate atypical laboratory conditions.

The basis for comparison entails control groups or external criteria in order for researchers to make comparisons between the experimental and the non-experimental groups.

Researchers should estimate, approximately, the amount of data required in order to generate precise statistical results.

Uncontaminated data is that produced without measurement error and without distortion of experimental effects.

Also, researchers should pay attention to 'irrelevant' variables which may affect the experiment's sequence. 'Irrelevant' variables do not have a close relationship with those under study. Such variables can be gender, intelligence or the subject's background.

In order to acquire generalizable data, researchers take care of the representativeness of their sample. This can be achieved by applying randomness either to the selection of the sample, or to the assignment of the subjects to the experimental and control groups.

Finally, the criterion of parsimony means that researchers should prefer simpler designs to more complex ones, without, of course, distorting the experiment's purposes.

Another term, which pertains to experimental research is that of experimental validity. According to Wiersma (1986):

> *"Experimental validity is of two types, internal and external. Internal validity is the minimum control, and so forth, necessary to interpret the results. External validity deals with the extent of generalizability of the results."* (p.107)

There are many types of experimental research, such as:

a) the post-test-only control group design where subjects' performance is measured only after the experiment treatment(s) have been applied.

b) the pretest-posttest control group design where subjects' performance is measured before and after the experimental treatment(s).

c) the quasi-experimental non-equivalent control group design where subjects have not been allocated randomly to experimental and control groups.

d) The single-subject design which involves repeated measurements of the variable that is studied.

There are also other types of experimental designs which are variations of the above forms.

5.4.1.2 The survey research.

Survey research is a descriptive method. It is mostly concerned with gathering facts and information in order to provide a reliable picture of a situation under study. It is a non-experimental method and there is no manipulation of variables. Usually surveys are used in order to give answers to questions of "What is...?". Also, surveys aim to describe a certain situation by giving the conditions that exist in this situation, by identifying its characteristics and by defining relationships which determine the status quo of the situation under study. Best (1981) said that:

> *"It [survey method] is not concerned with characteristics of individuals as individuals. It is concerned with the generalized statistics that result when data*

are abstracted from a number of individual cases. It is essentially cross-sectional." (p. 94, 95)

There are sample surveys and population surveys. Population surveys are applied to large numbers of subjects. Most of the time it is impossible to include the whole population and even if researchers manage to examine an entire population, this will affect the investigation because the accuracy of the measurements will be reduced. When an extended period of time is required for measurements, then the population might change in reference to the dependent variable. That is, measurements of individuals taken earlier and those taken later may be distorted by the passing time. A sample survey includes part of the population. It is a selected part and this selection is random. Sample surveys are used when researchers are interested in generalizing their findings about the population from which the sample is chosen. Creswell (1994) claimed that:

"A survey design provides a quantitative or numeric description of some fraction of the population -the sample- through the data collection process of asking questions to people. This data collection, in turn, enables a researcher to generalize the findings from a sample of responses to a population." (p.117)

One of the major steps that a survey researcher must take, after he/she has specified the exact topic of the study, is to identify and to describe the population in which the researcher is interested. This is not an easy thing to do as it is difficult to find people who share largely the same characteristics or belong to the same categories. Furthermore, the accessibility to the population varies. For instance, it is easier to survey pupils than teachers or pupils' parents. There are two methods of sampling: probability and non-probability. With the former the probability of the selection of each subject is known and in the latter is unknown.

The kind of sample that researchers select, depends on the survey topic. This is important because it ensures the 'safety' of the generated data. By 'safety' is meant that appropriate people will give answers to the situation under study.

Another essential component of a survey plan is the instrument which will be used in data collection. Researchers have to state whether they will use a self-designed instrument, a modified one or an intact instrument developed by someone

else. They must justify their choice since the variables of the study have a direct bearing upon the choice of instrument. The most popular tools for data collection in surveys are: personal interview, written questionnaire and controlled observation. Interviews and questionnaires consist of questions that pertain to the survey topic. Thus, researchers get answers to the questions they are interested in and when they use interviews they have the chance to elaborate more on the questions and on respondents' answers since there is personal contact. Controlled observation is concerned with the results of standardised tests which researchers observe. Wiersma (1986) said:

> *"Controlled observation usually involves the use of an available instrument, such as a test or attitude inventory. Data collection is highly structured and controlled."* (p. 205)

The pilot testing or the field testing of the survey is important as it shows researchers whether their instrument is right or needs to be improved or even changed. Youngman (1978) said that:

> *"Its [pilot study] objective is to examine the suitability of the sampling, the measures and the procedure."* (p. 37)

Thus researchers know if they have to change ambiguous or confusing parts of their instruments and they also see how they can cope with the research. Of course, pilot sample subjects should not be used in the main survey.

5.4.1.3 Ex post facto research.

Ex post facto research is the kind of research that bases its data on facts that have already occurred. The phrase 'ex post facto' literally means 'from what is done afterwards'. Researchers examine situations retrospectively and try to trace cause and effect relationships. They search for links between existing conditions and possible causes. The reason why they investigate such situations is because certain facts cannot be repeated or manipulated in order for them to generate data. For instance, a case linking smoking to lung cancer cannot be possibly investigated

using human subjects. Such a case needs to be examined by ex post facto research. Wiersma (1986) said that:

> *"Ex post facto research is systematic and empirical inquiry in which the independent variables have already occurred and are inherently not manipulable by the researcher. Inferences about relationships among variables are made without direct intervention."* (p. 172)

Thus, the researcher has the outcome in his/her hands and he/she tries to establish a causal link between this outcome and possible effects of certain events.

There are two kinds of ex post facto research: co-relational or causal study and criterion or causal-comparative study.

With the co-relational or causal study, the researcher is concerned with the identification of factors that have affected a present condition. Thus, the researcher collects data from past situations and correlates them to present situations. Cohen and Manion (1989) gave an example of such a study conducted by Borkowsky (1970) who wanted to investigate the link between the quality of a teacher's undergraduate training and his/her subsequent effectiveness as a teacher of this subject. In order to measure the quality of the teacher's training he included grades in certain courses, the overall average and in order to measure teacher's effectiveness he included pupils' performance, knowledge. In this kind of research, associated measures can be achieved but as the researcher has no control over the variables, it is not possible to establish clear causal links.

The second type of ex post facto research is criterion or causal comparative approach. In this type of research, the researcher compares two groups with similar subjects. The difference is that one group has characteristics of the variable under study and the other group does not. Cohen and Manion (1989) gave another example of that kind of research. Such an example presented a researcher who chose to examine factors contributing to teachers' effectiveness. He used two groups where one group (the criterion one) included the effective teachers and the other group did not have the characteristics of the criterion group. This can be achieved by measurements of differential effect on children. So, the researcher may examine different kinds of events, for instance, teachers' background training, skills, in order to find out what variables affect teachers' effectiveness.

In both types of ex post facto research there is no manipulative control of variables by the researcher. When causal correlations are found, researchers cannot be sure which variable is the cause and which is the effect. Researchers also cannot randomise their sample. Subsequently they cannot possibly trace all the factors that may cause different effects. That is, a relationship between two variables may not be a causal one, as it seems, but they can both be results of a third factor. As Cohen and Manion (1989) claimed:

> *"The point is that the evidence simply illustrates the hypothesis; it does not test it, since hypotheses cannot be tested on the same data from which they were derived."* (p.180)

The ex post facto research is most appropriate where the experimental approach is not possible and sometimes can be used as a preliminary stage of more elaborate investigations, giving researchers an idea of how the situation is.

5.4.2 Qualitative methodology.

The qualitative or interpretative approach differs from the quantitative or positivist approach in the sense that the former does not pursue theories that justify certain situations and that can be generalized into universal laws. Qualitative researchers start their research with a general problem or idea and their aim is to see what they find without necessarily having to establish laws. They gather information giving priority to 'natural' settings. This is the primary source of their data. Hitchcock and Hughes (1995) claimed that:

> *"...a qualitative research orientation places individual actors at its centre, it will focus upon context, meaning, culture, history and biography."* (p. 25)

It is apparent that social sciences deal with a diverse array of principles, attitudes, meanings and ideas. This interrelatedness prevents the researcher from investigating specific factors. Some of the main characteristics of qualitative research, according to Hitchcock and Hughes (1995) were:

"a. Qualitative researchers focus upon natural, ordinary, routine day situation collecting unstructured data which is not heavily structured by the researcher.
b. Qualitative data is collected in a number of different ways and in a variety of settings.
c. Qualitative researchers are concerned to make sense of, understand and interpret the data, rather than to count and measure them.
d. More often than not qualitative research deals with a small number of cases.
e. Qualitative researchers analyse their data in an inductive way focusing upon peoples' perceptions, interpretations and meanings since they are concerned more with social processes than social structures.
f. Qualitative research is not concerned with the testing or the performulating of hypotheses, but with developing theories which are 'grounded' in the data.
g. Qualitative research as currently practised is emergent, creative and open-ended." (p. 116)

Qualitative researchers work with small samples. This is in contrast with quantitative researchers who work with large samples. Also, the latter's sample is random while the qualitative researchers' sample can be described as purposive.

Research approaches in the qualitative paradigm are ethnography, phenomenology, historical research, case study, biography and educational connoisseurship.

5.4.2.1 Ethnography.

Ethnography deals with the study of people's life, where researchers describe and analyse cultural phenomena and beliefs. The researcher is interested in peoples' lives and in their prominent characteristics. The ethnographic researcher conducts his/her study over an extended period of time, as he/she has to take part in the lives of the people under investigation. Ethnographic researchers do not create the conditions under which they examine their subjects. They conduct their studies in different daily contexts. This is why it is difficult for them to have a structured investigating plan for collecting data. Of course, this does not make their research unsystematic. It is simply that the initial data they collect is in a raw form. However, as their project proceeds, they are able to focus on the specific factors and relationships they want to investigate. Usually they concentrate on a single group or even on a single individual, and gather information about them from a range of sources. The analysis of data consists mostly of the interpretation of meanings and

actions which lead ethnographic researchers to descriptions. Quantification and statistics are not their primary aim.

Naturalism, understanding and discovery are three features which characterize ethnography.

Naturalism signifies the major character of an ethnographic study as it places great importance on naturally occurring behaviour which can be studied first-hand. Natural settings place relationships in the right context and give them a more objective perspective. They investigate situations, not in artificial environments, but in environments where they exist inherently.

Understanding refers to the ability which researchers have to realize what is going on. Human actions are not simply fixed responses to stimuli. The concept of causality is not as simple in social sciences as in natural sciences. There are causal relationships in the social world but their explanation involves interpretation of stimuli and understanding of the cultural perspectives which are prominent in the specific context. So, ethnographic researchers have to learn the culture of the people they observe in order to generate valid explanations.

Ethnographic research is discovery-based, meaning that it does not start an investigation by testing a set of hypotheses. Researchers set out having a general interest in certain social phenomena and, as their research proceeds, they limit their investigation to the topics in which they are interested. If they set out with specific hypotheses in mind, they may fail to discover the true nature of the situation they examine.

In this kind of research investigators are also interested in small samples. They prefer depth to breadth. Depth gives ethnographers relevant information. They do not jeopardise the research's findings by misunderstanding key features. Hammersley (1990) said that:

> *"The central goal of ethnographic research is often conceptualised as providing an analytic, thick or theoretical description..."* (p. 19)

It is more feasible to describe attitudes, beliefs, motives, intentions, values than to quantify and to generalize them.

The techniques used for collecting data are various. These are observation, (participant and non participant), interview and document analysis.

5.4.2.2 Phenomenology.

Phenomenology examines phenomena. It examines what is already out there in the world. There are two phenomenological traditions, the descriptive and the interpretive.

Husserl is acknowledged to be the father of phenomenology in general and of descriptive phenomenology in particular. He considered phenomenology as a philosophy, as an approach and as a method. For Husserl (in Morse, 1994) the aim of phenomenology was to describe the structure of the living world as it is perceived by individuals. In Morse (1994) it was claimed that:

> *"Husserl's aim was the avoidance of all conceptually bound and theoretically constructed beginnings."* (p. 119)

This means that for one to know the world, one has to give up his/her preconceptions or theories and start getting to know things as they appear, describing experiences as they are lived and perceived by peoples' consciousness. Husserl called this 'transcendental subjectivity' (in Morse, 1994). Researchers confer meanings by individuals' experiences trying in this way to reach at the true character of things. To achieve something like this, reduction is needed. By reduction one means the procedure of abstracting the natural world from researchers' minds. Morse (1994) said that:

> *"Reduction is the process of looking at the experience naively, without the preconditions, the prejudices, and the biases that one usually brings to any description."* (p. 148)

Descriptive phenomenology aims to describe the world in reference to peoples' experience of it.

The second phenomenological tradition is the interpretative one. Heidegger is the main representative of this tradition. Here, the primary concern is not in describing phenomena, as they appear themselves covering all pre-suppositions of

the world. Instead pre-suppositions are not to be limited or eliminated, but play a great role in understanding the phenomena. Interpretative phenomenology is interested in how people make sense of their existence in this world. That is why understanding is a major term in this tradition. They place great importance on the use of language, on historical influences, on past tradition and human experiences. They consider social context and human actions to be inseparable since they are interactive. Morse (1994), writing about interpretative phenomenology, said that:

> *"...lived experience is itself essentially an interpretive process...understanding and possibilities are the outcome of interpretation; these are linked to cultural norms."* (p. 148)

That is, there cannot be an interpretation without a context in which both subjects and researchers participate.

5.4.2.3 Historical research.

Historical research is the kind of research, which is concerned with past events. It is concerned with events that have already occurred and therefore the researcher cannot possibly change or manipulate any factor in order to examine or test theories and hypotheses. The historical researcher does create hypotheses, which will help him/her to focus on certain material and limit his problem topic. The importance of historical research lies in the fact that people can employ the past in order to predict the future. People may find similarities between situations and such data may lead them to take better decisions and actions. As Cohen and Manion (1989) wrote:

> *"Historical research has been defined as the systematic and objective location, evaluation and synthesis of evidence in order to establish facts and draw conclusions about past events."* (p. 48)

Seeking data from the past is not an easy task, as it implies reconstruction. The historical researcher has to reconstruct a situation by gathering all the pertinent material and locating the person(s) and event(s) under investigation in the right social, cultural and natural environment of the time and place he/she studies. It is impossible to give explanations without considering the historical circumstances that prevailed in certain periods.

The data sources available to the historical researcher are primary and secondary. Primary sources can be relics, fossils, tools, utensils which transmit information about the past and also written testimonies such as documents, maps, laws, letters, memoirs, newspapers.

Secondary sources can be quoted material from textbooks, letters or descriptions of events or situations given by someone who was not present at the moment that the event took place.

Historical researchers should look for primary sources above secondary sources since the former are more reliable. Besides, researchers have to make sure that their evidence about the past is both authentic and accurate as far as the credibility of the author is concerned. That is, they may find genuine sources, but they also have to know that the authors of these sources are reliable. Cohen and Manion (1989) said that:

> *"Historical evidence has thus been described as that body of validated facts and information which can be accepted as trustworthy, as a valid basis for the testing interpretation of hypotheses."* (p. 57)

However, secondary sources should not be eliminated or minimised as they can support the validity of the primary ones or sensitise researchers to look for more specific features of an event or a person in the past.

5.4.2.4 The case study.

The case study is a non-experimental descriptive method. It examines systematically a specific phenomenon, which can be a programme, an event, a person, a social group. Researchers using case study concentrate on all or on the majority of the variables present in a single unit. They seek holistic description and explanation. Thus, case studies focus on particular situations which are important for the data they produce. Researchers reach an outcome which is a 'thick' description of the phenomenon under study. 'Thick' description, as Merriam (1988) said:

> *"...is a term from anthropology and means the complete, literal description of the incident or entity being investigated."* (p. 11)

Also, case study researchers may discover new concepts and relationships, as situations are illustrated in all their characteristics and complexities. Information can be acquired from a large variety of sources, so different kinds of explanations can be formulated and insights can be offered for the phenomenon under study.

There are three types of case studies: descriptive, interpretative and evaluative.

The first one of these gives a detailed account of the situation under study. It is useful in providing information in areas where little research has been done. Merriam (1988) said that:

> *"Such studies often form a data base for future comparison and theory building."* (p. 27)

Interpretative case studies also include a rich description, along with gathering information about the problem and aim to interpret and to give theories about the phenomenon.

Finally, evaluative case study is concerned not only with description and explanation but also with judgement too. Based on the information generated by the study, researchers are able to use the important data in order to evaluate situations and plan new actions respectively.

A case study gets close to the situation under study in more than one aspect, whereas experiments and surveys are less focussed on the phenomenon they are studying. Merriam (1988) claimed that:

> *"Case studies are particularistic, descriptive, holistic, and inductive. They also are concerned with understanding and describing process more than behavioural outcomes."* (p. 31)

In conclusion, it is fair to say that case studies try to illuminate meanings and to offer insight which can be valuable in supporting future research.

5.4.2.5 The biography.

With the biographical method researchers use documents, stories, narratives and accounts of their subjects' lives. Such documents may be diaries, letters or records. However, the core of this method is personal life experiences. Besides

biography there is also autobiography, which means that the account of a person's life is written by himself/herself.

The biographical method is based on subjective meanings that individuals give for their lives. Here the word 'subjective' should be underlined. People narrate their life experiences according to their understanding and interpretation of these experiences. The expression of the experiences is subjective and, as Denzin (1989) said,

"...shaped by cultural conventions." (p. 33)

So, there is an inconsistency between what actually happens in peoples' lives and how they perceive it and feel about it. For instance they may view events in their lives as positive or negative experiences. Also, the way they relate their experiences is of great importance since they live in certain social contexts and have certain influences. Hence, researchers should base their results on the correlation between peoples' life experiences and certain social, historical, economical factors. Denzin (1989) claimed that:

"Autobiographies and biographies are structured by a set of literary sociological, and interpretive conventions..." (p.34)

and

" Biographers need society in order to locate their subject..." (p. 46)

Other biographical forms are life stories, self-stories, personal experience narratives and life history.

Life stories include significant parts of individuals' lives. Self-stories examine individuals' life accounts in relation to a certain experience. Both these kinds of biography take the narrative form and place at the centre the character that tells the story. The story the individuals narrate has a beginning, a middle and an end, and it is told in a discourse.

Personal experience narratives deal with what people say about their own experiences referring to common experiences that exist in a group. According to Denzin (1989):

> *"...[personal experience narrative] describes a set of events that exist independent of the telling."* (p. 44)

Researchers try to understand how people who share the same experiences may account differently for the same facts.

Life history is a written account concerning individuals' lives. Researchers get their information using interviews and conversations. Life histories give data to researchers not only about the specific individual whose life is described, but also about the time and the social context to which the individual belongs. Life histories, then, are supplemented by information provided by other sources and not only by the individuals themselves.

Researchers, who use the biographical method in order to interpret the documents they examine, try to trace a set of objective experiences. These experiences are usually connected, as Denzin (1989) stated:

> *"...to life-course stages (childhood, adolescence, early adulthood, old age) and to life-course experiences (i.e. education, marriage, employment)."* (p. 56)

In order to do so, they use interviews in which the subjects under study elaborate and reflect on their own lives. In this way researchers try to reconstruct individuals' biographies and highlight important features of their lives.

5.4.2.6 Educational connoisseurship.

Educational connoisseurship is another model for qualitative research. The notion of connoisseurship refers to the researchers' ability to perceive the subtle characteristics and meanings of a topic under study. Literally, connoisseurship implies expert knowledge on something. This kind of knowledge is acquired by continuing first-hand experience. Hence, researchers are able to discern important differences, complicated issues and 'hidden' factors, which have an effect on their

studies. Thus, a more complete appreciation, estimation of the situation under investigation is achieved. In order for researchers to become connoisseurs on certain issues they need to perceive subtleties, that is, not only look at but see through things. By doing so, they highlight concealed meanings and at the same time they recognize what role these concealed meanings play in the structure of their study. Therefore, educational connoisseurship entails a 'thick description' of what is happening, that is a thorough description of the subject under study in as detailed and vivid a way as possible. Researchers try to give an outline, which is focussed on the issues concerning their topic in a direct or an indirect way. They then discuss their findings, trying to interpret them, trying that is to find causal links and determine what are the effects on those involved. At this stage, researchers use different theories in order to explain and interpret the meaning of events based on certain contexts. Eisner (1979) claimed that:

> *" No one is interested in the facts by themselves but rather in the facts interpreted."* (p.207)

That, of course, does not mean that theories give one correct interpretation of the events. They just try to show how different theoretical frameworks provide alternative explanations. Finally, after the description and the interpretation of the topic under study, researchers need to appraise and evaluate what they have found and what they have seen. Evaluation can be used as a term parallel with the term criticism, where qualities of the topics under study are illuminated and so help researchers to appraise their value. Evaluation and criticism are very important procedures as they actually promote a progress for the evaluated situations. So, educational criticism leads to educational progress.

Educational connoisseurship and educational criticism are two terms that have been linked together (Eisner, 1979). In order to criticise, one needs to know a lot about the issue which is to be judged and evaluated. Their major distinction though, as given by Eisner (1979) was that:

> *" ...connoisseurship is the art of appreciation, criticism is the art of disclosure."* (p. 193).

A combination of the two functions described above can surely help researchers, as they provide them with a full awareness of the characteristics and qualities which in turn can lead them to useful evaluations.

5.5 Instruments used in conducting research.

The instruments that researchers use in order to do their research either qualitative or quantitative, are observation (participant, non-participant), interviews, questionnaires and context analysis.

5.5.1 Observation.

Observation is a technique used in both quantitative and qualitative research. In quantitative research, observation is used mainly as a preliminary stage. It is the first stage in which researchers are supplied with appropriate material in order to better understand the situation they investigate and to act accordingly. Usually they use observation to form concise and accurate questionnaires and interviews. However, observation has also been one of the prevailing methods of inquiry. Scientists are led to the development of theories by observing natural phenomena and by classifying and measuring them. The reason why observation is not preferred as a main method in quantitative research is because quantitative researchers use large samples for their investigation and it is difficult to conduct observational studies on large scales. Besides, observation has a largely subjective character and therefore observers report things that they consider important to the research topic. For another observer these observations may not be as important. Thus, quantitative researchers cannot depend solely on observation because it cannot provide reliable data.

In the social sciences, observation has a more fundamental role. It is considered essential to the understanding of another culture. Anthropologists argue that researchers should live by the rules and customs of the societies they investigate. They should look at as well as listen, they should keep field notes and they should focus on what people do. The aim is to collect data and learn at first-hand about the social world that he/she is investigating in a 'naturally' occurring context. Also, ethnographers, who deal with the study of human life, use observation in order to

describe phenomena within their various contexts and to extract from these descriptions data about the causes, the effects and the consequences of human behaviour. In the social sciences there are two forms of observation: participant and non-participant. According to Tesch (1990):

> *"Participant and non-participant observation are used to acquire first-hand, sensory accounts of phenomena as they occur in real world settings, and investigators take care to avoid purposive manipulation of variables in the study."* (p. 46)

With non-participant observation the researcher is distant from the phenomenon he/she studies: he/she does not participate in the context in the phenomenon under study.

Participant observation is the one in which the researcher takes part. He/she becomes part of everyday life in the usual, ordinary environment of the people he/she studies. Jorgensen (1989) said that:

> *"Through participant observation, it is possible to describe what goes on, who or what is involved, when and where things happen, how they occur, and why -at least from the standpoint of participants- things happen as they do in particular situations."* (p. 12)

Participant observation tries to make the conception of reality that natives have accessible to researchers. It is essential, therefore, for researchers to develop good relationships with the inhabitants and, of course, learn about the way they live and experience life. Participant observation is appropriate when researchers do not know much about the phenomenon under study. That is, when there is discordance between the views of outsiders and those of insiders. Also, when researchers decide to use participant observation, they should think whether they can gain access to the settings they are interested in and whether these settings are observable within an everyday life context.

The researcher's involvement can be overt (with the knowledge of insiders), covert (without the knowledge of insiders) or both, where selected insiders will have knowledge of the researcher's aims. However, Patton (1980) said that:

"The challenge is to combine participation and observation so as to become capable of understanding the program as an insider while describing the program for outsiders." (p. 128)

Participant observers usually gather data by having casual conversations, by conducting formal and informal interviews, by examining photographs, tools, buildings. Participant observers also keep diaries writing down unique experiences and other matters that may have interested them.

However, in participant observation there is the danger that the researcher may go 'native'. The researcher may become too absorbed in the situation he/she is investigating to see things objectively. Hence, researchers fail to understand the meanings that people give to their existence. Jorgensen (1989) claimed that:

"The more you participate the less you are able to observe, and vice versa." (p. 55)

That is, objectivity can be threatened by the researcher's subjective involvement.

5.5.2 Interview.

Interview is one of the major tools of social research. In quantitative research interviews would include questions that are pre-tested and standardised so that the reliability of the research can be increased. Researchers look for facts about behaviour and attitudes in random large samples.

In qualitative research, Silverman (1995) said that:

"The aim is usually to gather an 'authentic' understanding of people's experiences and it is believed that 'open-ended' questions are the most effective route towards this end. Qualitative interview studies are often conducted with small samples and the interviewer-interviewee relationship may be defined in political rather than scientific terms." (p. 10)

The interview is a dialectical procedure: a conversational encounter in which there is a direct interaction. When people converse with each other, they always have in mind who the other person is, what he/she may know, how he/she relates to themselves and to the world. The interplay between the interviewer and the

interviewee is inevitably influenced by various factors, such as colour, religion, class, gender and appearance. These factors may threaten the impartiality of the study and result in misconceptions of questions and answers by respondents and interviewers respectively. Also, the fact that the interview is conducted by one person may also distort the information. The interviewer may tend to impose his or her beliefs or viewpoints on the respondent. The extent of this bias depends on the kind of interview researchers conduct. There are standardised interviews, which may be structured or semi-structured and non-standardised, which include group-interviews and unstructured interviews.

The structured interview consists of pre-tested questions which are short and direct, quite often involving a simple 'yes' or 'no' answer. It has similarities with questionnaires, but its main advantage over them is its greater flexibility and its ability to extract more detailed information from the respondents. Structured interviews usually aim to produce generalizable findings, which is why they are often conducted with large samples. In this kind of interview, fixed questions help eliminate as much as possible the aforementioned bias. However, the highly structured interview restricts the respondent to the limited options offered by the interviewer.

The semi-structured interview, according to Hitchcock and Hughes (1995):

> *"...is a much more flexible version of the structured interview. It is the one which tends to be more favoured by educational researchers since it allows depth to be achieved by providing the opportunity on the part of the interviewer to probe and expand the respondents' responses. This is because the interviewer asks certain major questions of all respondents, but each time they can alter the sequences in order to probe more deeply and overcome a common tendency for respondents to anticipate questions. This can be done by including spaces on the interview schedule for the interviewer to add comments or make notes. In this way some kind of balance between the interviewer and the interviewee can develop which can provide room for negotiation, discussion and expansion of the interviewee's responses."* (p. 157)

Group-interviews help researchers investigate the interaction between people and the way that this can affect their views and how they are formed and changed. Researchers see how people interact during a discussion of a certain topic and how they react to disagreement. Group-interviews are quite indicative as far as attitudes

and behaviour are concerned. Researchers resort to group-interviews when they want to test a specific research question about consensus beliefs and when they demand greater depth and breadth.

The unstructured interview provides the interviewer with the opportunity to ask questions out of sequence and the interviewees with the opportunity to answer these questions in their own way. Hitchcock and Hughes (1995) said that:

> *"It is fair to say that there is an inherently more equal relationship between researcher and subject in the unstructured interview than there tends to be in the structured interview. The overall aim of unstructured interviewing is to create an atmosphere where the individual feels able to relate subjective and often highly personal materials to the researcher. To allow for this some researchers have gone so far as to encourage the interviewee to take greater responsibility for the interview, both in terms of planning the interview and organising the questions."* (p. 163)

Interview sessions can be tape-recorded or the interviewer can take notes verbatim as the interview is conducted, or write up the main features of the interview at some point after the interview is completed. The most complete and reliable record of what was said in the interview is produced by tape-recording the encounter.

5.5.3 Questionnaire.

Questionnaire is another instrument of data collection at the researcher's disposition. Questionnaires consist of a number of questions which the researcher does not have the opportunity to ask respondents on a personal basis. This happens because some research is expensive and time consuming. The most common form of questionnaire is the mailed one.

The advantages of a questionnaire are that it helps researchers obtain information in a structured format and it can be answered without the support of an interviewer. The disadvantages are that it requires a lot of time to be designed and can never offer all the possible answers, so its scope is limited. Furthermore, individuals are often reluctant to spend time responding to a questionnaire, so there may be problems with acquiring a sufficiently large sample.

The questions included in a questionnaire can be either of closed format or of open format questions. The closed format questions offer respondents alternative answers from which they can select one or more depending on the kind of the question. Open format questions, otherwise called open-ended, permit respondents to give their own answers and to formulate their responses in their own way.

Both kinds of questions have advantages and disadvantages. In the closed format case, respondents can answer more quickly as they only have to choose among possible options and for researchers it is easier to code and to analyse the data they generate. However, the closed format questions can create misleading impressions since the options offered may not provide respondents with the answers they want to give. Subsequently, they limit the amount of qualified information given.

On the other hand, open-ended questions give respondents the chance to express themselves freely, without any kind of bias emerging from the limited response range. However, it is difficult to code and to analyse such questions. It becomes easier for a researcher to make a mistake, that is, to misinterpret a response.

Since questionnaires depend on written language alone, researchers need to be very careful in phrasing the questions. They pay attention to the words they use, ensuring the questions are clear and unambiguous. This is very important since such mistakes in questionnaires deter respondents from answering them. Researchers should try to keep questionnaires short and neatly arranged with instructions where needed. Leading questions are not permitted as they cause bias and distort the information. It is helpful for respondents if the questions follow some sequence and when they proceed from general to more specific information. This allows respondents to organize their thinking and to give logical answers.

Regardless of the nature of the questions, questionnaire designers must define clearly the meaning of all terms involved in the research. The same word or phrase may mean different things to different people and since researchers have to depend on written language, it is essential to make clear, reliable questionnaires that can be easily understood by respondents. Cohen and Manion (1989) said that:

"An ideal questionnaire possess the same properties as a good law: it is clear, unambiguous and uniformly workable. Its design must minimize potential errors from respondents and coders... a questionnaire has to help in engaging their interest, encouraging their co-operation, and eliciting answers as close as possible to the truth." (p. 106)

5.5.4 Content analysis.

Content analysis is a further method of collecting data. Content analysis is concerned with analysis of such things as files, records, letters, images. Researchers generate data by examining the use of words, phrases, their frequency, their composition, and, of course, their range of meaning. Silverman (1995) said that:

"Content analysis is an accepted method of textual investigation, particularly in the field of mass communication. It involves establishing categories and then counting the number of instances when those categories are used in a particular item of text, for instance a newspaper report." (p. 59)

Thus, what researchers actually do is to design categories, which are pertinent to the research topic and classify all elements they consider relevant to the purpose of the research. The frequency of occurrences in each category can be counted and certain conclusions can be drawn. Tesch (1990) also referred to another technique used in content analysis which was:

"...the taking of 'inventories' of words in a document or transcription" (p. 80)

Researchers construct exhaustive lists where they put words in order of frequency. Again, they draw conclusions by counting the occurrences in lists. The data is numerical and categorised.

There is also another method of qualitative content analysis. Researchers examine the different meanings that words may have in normal use and, of course, in certain contexts. The words that interest researchers are taken from the extract with some other words which proceed and follow the actual word under study. Then, they group together the words in which the meaning is similar and they examine how broadly or narrowly they are used by the author.

Silverman (1995) said that:

"Quantitative researchers try to analyse written material in a way which will produce reliable evidence about a large sample. Their favoured method is 'content analysis' in which the researchers establish a set of categories and then count the number of instances that fall into each category. The crucial requirement is that the categories are sufficiently precise to enable different coders to arrive at the same results when the same body of material (e.g. news-paper headlines) are examined." (p. 9, 10)

However, Silverman (1995) claimed that:

"In qualitative research small numbers of texts and documents may be analysed for a very different purpose. The aim is to understand the participants' categories and to see how these are used in concrete activities like telling stories, assembling files or describing family life!" (p. 10)

5.6 Combining qualitative with quantitative approaches.

Qualitative and quantitative paradigms have so far been described as two different approaches to research. Their differences lie in the way they collect data, in the way they treat it and analyse it and in the reason why they are interested in it in the first place. Thus, quantitative approaches aim to gather large amounts of data in which they define variables and test possible relationships in order to establish general laws. Qualitative approaches, on the other hand, aim to describe situations, taking information in order to understand how different people perceive reality in different ways according to their social and natural environment.

The debate between these two approaches does not help either researchers or research when one regards the other as invalid. The preference that researchers show for one or the other paradigm depends on the topic they want to investigate and on the purpose of their research, for instance, the production or testing of a theory. However, every researcher tries to make sure that all aspects of their research topic will be examined and analysed no matter what kind of methods are to be used. That means investigators can use both quantitative and qualitative methods provided that the research problem itself guides them to which techniques they should employ. Patton (1980) talks about a new paradigm, *the paradigm of choices.* He claimed that:

> *"The challenge is to find out which information is most needed and most useful in a given situation, and then to employ those methods best suited to producing the needed information."* (p. 116)

Thus, both approaches supply researchers with appropriate examining methods, and where necessary, a combination of the two may help even more. Brannen (1992) claimed that:

> *"The researcher has to judge whether any important aspects of the research problem would be ignored if there was an exclusive reliance on one research approach."* (p. 69)

Of course, that does not make any paradigm of the two or their combination a superior method. Each research topic requires a certain approach which can be quantitative, qualitative, or a combination of the two.

Thus, depending on the research theme, combining quantitative with qualitative approaches can help researchers to achieve more holistic results. Boring (in Cohen and Manion, 1989) wrote:

> *"... as long as a new construct has only the single operational definition that it received at birth, it is just a construct. When it gets two alternative operational definitions, it is beginning to be validated. When the defining operations, because of proven correlations, are many, then it becomes reified."* (p.270)

There are different ways of combining approaches, as Brannen (1992) mentioned. Multiple methods, multiple investigations, multiple data sets and multiple theories can be characterized as triangulation. Cohen and Manion (1989) stated that:

> *"Triangular techniques in the social sciences attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint and, in so doing, by making use of both quantitative and qualitative data."* (p. 269)

Using multiple methods can be either between-methods or within-method. Between methods means using different methods in relation to the same object of study whereas within method means that researchers use the same method on a

number of different occasions and so they produce different aspects of the object under study at different times.

The term multiple investigators means that research may be carried out by more than one researcher, perhaps using different techniques. Thus, different individuals will see different perspectives of the research topic.

Multiple data sets refer to data that researchers collect from individuals or from a group where individuals interact with each other.

Finally, multiple theories can be generated by insights into multiple data sets. According to Brannen (1992):

> *"The notion of triangulation is drawn from the idea of 'multiple operationism' which suggests that the validity of findings and the degree of confidence in them will be enhanced by the deployment of more than one approach to data collection."* (p.63)

It could be argued that it is safer to use more than one method since their interaction can confirm the study's findings and can also reveal distortions. When two different methods, for example, lead the researcher to the same results, this suggests that the findings reflect reality and can be generalized and applied to the rest of the population. Of course, this is not an easy task since quantitative and qualitative research emphasize different points. For instance, quantitative research emphasizes certain variables and qualitative research emphasizes contextual details. That is why it is important for researchers to define from the start what they want to achieve by combining different methods, otherwise they may end up with data that is contradictory. However, Silverman (1995) said:

> *"Reality is supposed to be 'out there'. Thus it is a matter of finding the most effective and unbiased methods that, as precisely and objectively as possible, could bring out information about this reality."* (p. 93)

5.7 Justification for the Methodology of the Current Study.

The aims of a research study help to define the methodology and the investigation tools that the researcher will use. The current study aims to investigate how primary school teachers perceive environmental education and its practices as

an educational procedure. Thus, a primarily qualitative approach was preferred to a quantitative one for a number of reasons. These reasons are:

- The research has an interest in teachers as individuals. Hence, since the qualitative approach gives the researcher the opportunity to investigate the issues from 'inside', considering the way in which individuals live and experience life, this approach was considered to better fit the purposes of the study. The quantitative approach aims to measure knowledge rather than define and describe it. Thus, since the current study did aim to define and to describe how primary school teachers perceive environmental education, and not to measure the extent of their knowledge about environmental education, a qualitative approach was regarded as being more appropriate.
- There were no a priori hypotheses determined by the researcher. The study did not aim to test whether certain hypotheses were true or false. Also, the study did not ask teachers to rate statements concerned with environmental education which were given to them a priori. It was interested in arriving at a conclusion through statements about environmental education that were derived from teachers' replies.
- The sample of the study was comprised of teachers whose commitment to environmental education was not known or taken for granted. Hence, it was assumed that part of the sample may not have heard of environmental education at all or may not know much about it. Consequently, it seemed right to use an approach that would investigate how environmental education is perceived by teachers who have not been specially prepared for it or informed about it.
- Finally, another reason stemmed from the review of the literature, which showed that most research projects in the field of environmental education aimed at measuring knowledge of certain aspects of environmental education using quantitative techniques. The present study aimed to contribute to the smaller number of qualitative studies carried out in the field of environmental education.

The qualitative approach belongs to the interpretive paradigm. The interpretive paradigm as opposed to the positivist one focuses on the individual and aims to investigate the subjective world of human experiences in a certain social and

political context. The first two reasons cited above justify the preference the current study has towards the qualitative approach and also describe characteristics of the interpretive paradigm, as presented at the beginning of the chapter.

Despite this preference, the current study has used a combination of qualitative and quantitative analyses. That is, as soon as the data were collected, response categories were created and various tables and graphs presented the data in numerical form and in graphical representations. This quantification of the data did not aim to give generalisable results, but rather to illustrate where teachers have placed a greater or lesser emphasis. Explanations for teachers' emphases were attempted based on the school curriculum, on the training teachers had undergone and on other factors that might have played a significant role in their responses.

Finally, the choice of a primarily qualitative approach was justified by the actual study itself. That is, the qualitative approach adopted proved to be effective. Teachers had the time to contemplate and discuss the questions the researcher asked. It is believed that the 'freedom of speech' that teachers had, helped the study reach conclusions which would have been difficult to make if alternative approach had been used. For instance, the research revealed how teachers have defined environmental education, how they had described the curriculum content of environmental education and how they have discussed its most significant aspect referring to the same three issues (e.g. local environment, general environmental issues, fostering positive attitudes). Another example, which endorses the choice of a qualitative rather than a quantitative approach, is the fact that some times the teachers' replies to different questions reinforced one finding and proved that there was consistency in teachers' beliefs and practices. For instance, English teachers favoured topic work as the most successful way of implementing environmental education. When the discussion turned to whether they taught environmental education or not, they also referred to the way they taught it, and it was topic work which proved to be the most popular way of incorporating environmental education in to the school curricula. So the results indicated that the English primary school teachers not only believed in theory that the best way of delivering environmental education was through the topic approach, but that they actually put this into practice in their day to day teaching.

The qualitative approach was identified as the best approach to investigating the questions of the current study. Had the study followed a quantitative approach, it would have been possible to draw out generalisations from the findings (albeit even if they were preconceived). Instead, as the scope of the study is limited to the two countries where the investigation took place it can only make assumptions about similar findings occurring in other places both within England and Greece and abroad.

5.8 Justification for the instrument of the current study.

The semi-structured interview is the main instrument of the current study. Since the aim of the current study is to describe how primary school teachers perceive the term environmental education, a semi-structured interview was regarded as the most appropriate instrument to achieve this goal.

The semi-structured interview belongs to the category of standardized interviews. With the standardized interview there are a number of questions which attempt to examine the issues in question. There should be a sequence to these questions. With a semi-structured interview, there is such a sequence but at the same time the interviewer has the flexibility to break the sequence in order to probe interviewees' responses. Thus, the interview with every subject becomes a conversational encounter and each interview can lead to various responses regarding the issues under investigation. The interviewer and the interviewees are able to develop a conversation based on the questions posed. The selection of a semi-structured interview instrument is therefore in accordance with the study's interest in teachers as individuals, since it allowed the researcher to expand on the questions posed to the interviewees and created the conditions under which each respondent was free to describe various aspects of the issues being investigated.

The selection of a semi-structured interview is also justified by the fact that teachers were not identified prior to the study as currently delivering an environmental education curriculum. The purpose of the questions, were to detect the teachers' awareness of and motivation to teach environmental education. A structured interview would limit such a possibility as it aimed to measure degrees rather than to identify factors.

However, it is important to draw attention to certain limitations that can occur when using a semi-structured interview. One such limitation is that the interview might turn into a broad and general conversation. That is, the researcher could lose focus in the investigation and consequently not obtain the information that s/he really needs to acquire. At the same time, acquisition of a great deal of raw data can make the process of creating response categories much harder. Such a subjective procedure requires the researcher carefully to design questions that allow him/her to accurately represent the views of the sample under discussion.

The next chapter discusses in detail the questions used in the semi-structured interview and describes the response categories which emerged from the interview data.

6. EMPIRICAL STUDY.

The current study has used a qualitative approach and a combination of qualitative and quantitative analyses. Reasons which explain and justify the choice of the particular methodology and instrument used in the study have already been described in chapter 6 where different research paradigms and methodologies were discussed. This chapter describes the sampling method used, the questions of the semi-structured interview and the response categories that derived from teachers' replies.

The data collection of the current study started in 1997 and was completed in 1998. At that time the term 'environmental education' was more familiar in everyday educational use than the term 'education for sustainability'. Thus, teachers were prompted to discuss environmental education and its characteristics rather than 'education for sustainability'.

6.1 Sampling.

The current study's population was defined as primary school teachers. The selection of the primary schools was determined by school lists that the researcher was provided with by local authorities of three counties in both England and Greece. Originally, every tenth school was selected from the list. If a school replied negatively to the researcher's request to participate in the study, another primary school would be picked in the same way from the same list. However, sometimes the tenth school on the list was not contacted, as their geographical location would prevent the researcher from travelling to them. Here, it is also necessary to mention that the total number of Greek schools on lists were fewer than was the case in England. Thus, the researcher had to pick every fifth school from the Greek list rather than every tenth. Moreover, three of the Greek schools participating in the research were found through people known to the researcher. The reason for this was time constraints and at the same time it proved very difficult to find teachers willing to participate in the study. Hence, the selection of the sample has not been entirely random, but it was certainly unbiased. The researcher asked three teachers from each school to discuss environmental education. These three teachers were not selected by the researcher. They were volunteers who wanted to participate in the study. The fact that the sample of the study has not been selected on the basis of

absolute randomness prevents it from being open to statistical testing for representativeness.

The number of English schools participating in the research was 14. From each school 3 teachers were interviewed, apart from one school where two Key Stage 2 teachers talked to the researcher together. Hence, the total number of English teachers interviewed is 43. Eleven of them (25.6%) were male and 32 of them (74.4%) were female (Table 1). The age range comprised 9 male and 23 female teachers in the category 30 to 50 years old (74.4%), 1 male and 2 females were over 50 years old (7%) and 1 male and 7 females were under 30 years old (18.6%) (Table 2). Twenty-seven teachers (62.8%) taught Key Stage 2 classes, 10 of them (25.6%) taught Key Stage 1 classes, 2 teachers were head-teachers (4.7%) who taught all classes and 3 teachers (7%) were teaching nursery-reception classes (Table 3).

Table 1. English Teachers: Analysis of Sample by Gender.

Categories	Number of teachers	Percentage
Female	32	74.4%
Male	11	25.6%
Total	43	100%

Table 2. English Teachers: Analysis of Sample by Age group.

Categories	Female Teachers	Male Teachers	Percentage
Under 30	7	1	18.6%
Between 30-50	23	9	74.4%
Over 50	2	1	7%
Total	32	11	100%

Table 3. English Teachers: Analysis of Sample by Age of Pupils taught.

Categories	Female Teachers	Male Teachers	Percentage
KS1	10	1	25.6%
KS2	19	8	62.8%
Head-teachers	0	2	4.7%
Reception class	3	0	7%
Total	32	11	100%

It can be seen that the majority of the sample comprises female teachers (74.4%) between 30 to 50 years old (74.4%) teaching Key Stage 2 classes (62.8%). This finding will prevent significant comparisons among teachers of different age, sex and grade, as high percentages of teachers are concentrated on one category.

Fourteen Greek primary schools were included in the research. Three teachers from each school were interviewed making the number of teachers participating in the research forty-two. Twenty-seven (64.3%) of them were female teachers, while the remaining fifteen (35.7%) were male teachers (Table 4). Their ages were not greatly varied. Thirty-nine teachers (92.9%) were between the age of 30 to 50 years old and three of them (7.1%) were over the age of 50 years old (Table 5). Six teachers (14.3%) were teaching Key Stage 1 classes, thirty-five (83.3%) were teaching Key Stage 2 classes and one teacher (2.4%) taught physical education (Table 6).

Table 4. Greek Teachers: Analysis of Sample by Gender.

Sex	Number of teachers	Percentage
Female	27	64.3%
Male	15	35.7%
Total	42	100%

Table 5. Greek Teachers: Analysis of Sample by Age group.

Age	Female Teachers	Male Teachers	Percentage
Under 30	0	0	0
Between 30-50	27	12	92.9%
Over 50	0	3	7.1%
Total	27	15	100%

Table 6. Greek Teachers: Analysis of Sample by Age of Pupils taught.

Grades	Female Teachers	Male Teachers	Percentage
KS1	5	1	14.3%
KS2	22	13	83.3%
P.E. Teacher	0	1	2.4%
Total	27	15	100%

These percentages from both English and Greek schools indicate that the possibility of making significant comparisons between gender, teachers' age and grades they taught, is not likely. The number of teachers in these 3 categories (Sex, Age, Grade) is below the numbers required to allow the study to make important distinctions from the data based on these particular categories. The teachers who volunteered to be interviewed were teachers who either felt confident enough to talk to the researcher or teachers who felt they could simply help the research. The fact that just before the interviews started, teachers warned the researcher that they did not know much about environmental education is worth noting. This explains why the study did not demand any further requirements (for example, a certain number of male and female teachers) when asking for teachers from each school to participate in the study. It was difficult enough to encourage teachers to talk about something they felt they did not have much knowledge of, let alone to ask for teachers of a certain sex and age who taught certain classes.

6.2 The semi structured interview.

The semi-structured interview of the study comprised 15 questions. The first 6 questions attempt to investigate the first main goal of this study, that is teachers' awareness of environmental education. The choice of the particular questions used is based on an analysis of the literature review in chapter 4. In these studies, researchers who wanted to investigate teachers' awareness, knowledge and perceptions of environmental education used similar types of questions (either in interviews or questionnaires). They also discussed definitions of environmental education, described its content, suggested how it can be taught and described aspects of it which can have a greater or lesser impact on pupils and awareness of

relevant documents or organisations. See for example, Ham and Sewing (1987/88), Dorion and Gayford (1990/91), Spork (1992), Simmons (1993), Papadimitriou (1992) and Schwaab (1982/83). In order to investigate teachers' awareness of environmental education these studies asked teachers to define it and to describe its school curriculum content. The questions that these researchers used in their studies could only be inferred from their findings because they were not actually presented in the articles. For example, the Ham and Sewing (1987/88) study revealed that teachers thought environmental education was the teaching of knowledge, the wise use of resources or the teaching of the interconnectedness in the environment (pp.98-99 of this thesis). Since they did not state the actual questions posed to the teachers it was deduced that the researchers wanted to see what teachers understood by the term 'environmental education'. Similar inferences about their questions were made from studies which presented conclusions regarding the school curriculum content of environmental education. For instance questions 1 and 4 were based on the Dorion and Gayford (1990/91) study which revealed that teachers mentioned both the cognitive and the affective domain as important aspects of environmental education that pupils should be made to engage in (p.100 of this thesis). Questions which addressed the over-arching themes of ABOUT, IN/THROUGH and FOR the environment were taken from studies such as Spork's (1992) who used the three-fold distinction in order to see which of the three dimensions was mostly implemented in teachers' classes (p.103 of this thesis). Thus, the studies in the literature review of chapter 4 either explicitly or implicitly shaped the questions posed in the questionnaire of this study. However, the phrasing of the actual questions was determined by the researcher. Moreover, the researcher, when phrasing the open-ended questions, used words and phrases that specifically tried to focus the interviewee upon specific aspects of environmental education and were designed faithfully to reflect the factors that the literature review identified.

Hence, the first 6 questions of the interview are:

1. a. What do you think environmental education is and what should its aims be?

b. How long do you think it has existed as part of the school curriculum?

2. Do you know any important publications, conferences or other initiatives that have determined the character of environmental education?

3. Are there any particular student ages that environmental education should be focused on?

4. What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

5. What do you think are the best ways of incorporating environmental education in the school curriculum? For example, should it be a separate subject or part of a general topic and why?

6. a. What are the most important aspects of environmental education that children should learn?

b. How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

Six further questions attempted to examine the second main goal of this thesis, that is, teachers' motivation to teach environmental education. These questions were also based on the literature review. Specifically, factors such as training in environmental education and availability of resources (parks, schools' surroundings, environmental organisations) played a prominent role. Studies which addressed these issues included Simmons (1996), Jaus (1978), Mirka (1972), Lane, Wilke, Champeau and Sivek (1995), and Ballantyne (1995). At the same time, questions 8 and 9, (which addressed the last time teachers practiced environmental education and the way they preferred working) attempted to expand issues raised in question 7 (which asked teachers whether they taught environmental education or not). Studies like those of Jaus (1978), Lane, Wilke, Champeau and Sivek (1995) and Ballantyne (1995) emphasised the importance of training in environmental education. The current study sufficed to ask (question 12) whether teachers had attended any such pre- and in-service training in order to identify sources of influence upon teachers. Studies like those of Mirka (1972) and Simmons (1996) focused on the natural areas and how these are used by teachers in environmental education. The current study aiming to see whether teachers include both rural and urban areas posed question 10 which referred to school's surroundings. Thus, these questions are:

7. a. Do you teach environmental education?

b. Do you feel you need more environmental information or teaching guidance on environmental issues?

8. When was the last time you carried out an environmental project or you made references to environmental issues in your teaching?

9. Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?

10. Have you ever used your school's surroundings in order to teach environmental education?

11. Are you engaged in any activities or organisations that will enable you to understand environmental education and plan any environmental activities?

12. Have you attended any pre- and in-service training courses for environmental education?

The final 3 questions investigate general environmental awareness. Studies such as those of Robertson and Krugky-Smolska (1997) showed that teachers get involved with environmental education because they feel strongly about environmental issues (p.127 of this thesis). Also, the study of Cross (1998) showed that teachers were aware of issues like 'sustainable development' through the media (p.133 of this thesis) and how teachers felt about the ecological state of the planet. Questions 13, 14 and 15 of this study addressed issues of teachers' perceptions concerning environmental issues, how important they feel these are and where their knowledge came from. These questions were designed to complement teachers' awareness of and motivation to teach environmental education. They are believed to help the researcher understand better how teachers' general environmental ideology may have influenced their awareness of environmental education.

These questions are:

13. a. What do you think are the most significant environmental issues affecting the world today?

b. Why do you think that these are the most significant?

14. a. Where do you think your knowledge of environmental matters has come from?

b. There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

15. a. Do you think we live in an environmentally literate society?

b. What about differences between developed and developing countries?

c. How do you see the school's role in creating future environmentally literate societies?

6.3 Research Questions and Response Categories.

The responses to the questions of the semi-structured interview led to the creation of various response categories. These were formed after a long period of time during which the researcher read the interviews very thoroughly. As soon as teachers' actual replies were highlighted, it became feasible for the researcher to read through all the replies (English and Greek) for each question. Certain themes emerged. These helped to create the final response categories. For instance, in questions 1, 4 and 6a which asked for an environmental education definition, for its school curriculum content and for its most significant aspect teachers discussed these factors referring to the local environment, to general environmental issues and to developing values for responsible behaviour. Thus, the categories that emerged from these questions referred to these themes. In other questions like 2 and 3 which asked teachers to discuss conferences or publications for environmental education and whether there are student ages more appropriate for teaching it, the categories were self-formed. That is, question 2 led to six categories that were already mentioned in the actual question, e.g. Local initiatives, Conferences/events, Publications, etc. (see p.150). The creation of response categories was a subjective procedure in the sense that the researcher herself created them based on teachers replies. So, there is an element of subjectivity to the process and the categories created are not self contained. There is a degree of overlap and statements may be located within more than one category.

The categories cover all of the responses from both English and Greek teachers. Thus, the first question asked teachers:

1. a) What do you think environmental education is and what should its aims be?

Five categories of response were formed from teachers' replies. These were:

A. **It incorporates teaching and learning about the environment in general.** (e.g. "*...teaching the children what state the environment is in now...*").

B. **It should focus on the local environment**. (e.g. "*...it's learning about the environment locally....the area that we live in...*").

C. **It incorporates teaching and learning both about the local and distant environments**. (e.g. "*...it's to do with the local environment and the world...larger...make them more caring...*").

D. **Environmental education dictates ways of behaviour towards the environment**. (e.g. "*....is about getting children to love nature and somehow help nature, to do something to become better...*").

E. **Others**. (e.g. "*...is preparing children for everything that life puts there and may encounter outside in the wider world...*").

b) How long do you think it has existed in school curriculum?

Four response categories were formed. These were:

A. **It has always been included in the curriculum**. (e.g. "*In lots of ways it's been here all the time...teachers have always taught environmental issues...*").

B. **It has existed for a substantial time, 10 years and more**. (e.g. "*It's existed for quite a while...but as environmental education as such I suppose since the late '70s*").

C. **It has only recently been introduced within the last 10 years**. (e.g. "*...it must have been the last 6 or 7 years...*").

D. **It does not exist in the school curriculum**. (e.g. "*...it doesn't exist as part of the school curriculum...it is not essentially involved in the National Curriculum...*").

2. Do you know any important publications, conferences or other initiatives that have determined environmental's education character?

Six response categories emerged from this question. These categories were:

A. **Local initiatives**. (e.g. "*...Newcastle initiatives like the WATCH club...the Lord Mayor's Cup...it's run every year and all schools are able to enter it...*).

B. **Publications**. (e.g. "*...the magazine from the Royal Geographical Society...*).

C. **Organisations**. (e.g. "*...World Wide Fund for Nature, National Trust, Keep Britain Tidy...*").

D. **Conferences-Events**. (e.g. "*...every year there is a national conference...*").

E. **No, I do not know any**.

F. **Others**. (e.g. "*...just these world studies where the children get together and they talk about how they think their environments going to be in few years' time...*").

3. Are there any particular student ages that environmental education should be focused on?

Two response categories were formed and these were:

A. **No, all ages are appropriate for environmental education**. (e.g. "*...the earlier the children begin to observe...their environment...the better...*").

B. **Certain ages are more appropriate for environmental education than others**. (e.g. "*...11 to 16 because they become more worldly and they're formulating their own personal philosophy of life...*").

4. What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

Four response categories emerged from this question. These were:

A. **Teaching about the local, immediate environment**. (e.g. "*...the element of protecting the environment...through the local environment...*").

B. **Teaching about general environmental issues**. (e.g. "*...things like pollution, acid rain...*").

C. **Developing a positive attitude towards the environment**. (e.g. "*...mainly care, things like avoiding pollution, understanding the impact of litter...get them in to good habits.*").

D. **Others.** (e.g. "*...what they can do to help the earth...what has been done to destroy it...*").

5. What do you think are the best ways of incorporating environmental education in the curriculum? For example, should it be a separate subject or part of a general topic and why?

Five categories emerged from this question. These categories were:

A. **As a subject in its own right**. (e.g. "*It should be taught...as a separate subject...*").

B. **Through separate subjects**. (e.g. "*...it's a merger of a number of subjects...*").

C. **Through topics**. (e.g. "*...it should be incorporated into a general topic...*").

D. **Through a combination of methods**. (e.g. "*...it can be both. I've done it as a general topic and I've incorporated it in to my science work...*").

E. **Others**. (e.g. "*...I've taken children to the nuclear power station at Hartlepool...and that in itself is an example of an environmental lesson...*").

6. a) What are the most important aspects of environmental education young children should learn?

Four response categories were formed. These categories were:

A. **The local environment**. (e.g. "*...they should know about the town they live in...know their own area...*").

B. **Values, caring and respect towards the environment**. (e.g. "*...care of living things really, animals....flowers....birds...*").

C. **General environmental issues**. (e.g. "*...safety things...dealing with road traffic...litter...*").

D. **Others.** (e.g. "*...to learn what damage has been done to the earth already and what they can do about it.*").

b) How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

Two response categories emerged from that question. These were:

A. **Through first hand experiences**. (e.g. "*By visits...practical activities...hands-on experience...*").

B. **Others**. (e.g. "*We do it through a topic on green issues...*").

7. a) Do you teach environmental education?

Three response categories were formed. These were:

A. **Yes, I do.** (e.g. "*Within the curriculum that we have...*").

B. **No/Not often**. (e.g. "*Not often...I usually get involved in some of the local studies...*").

C. **Others.** (e.g. "*For four years I've been in the Local Educational Centre for teachers, I wasn't working as a teacher...*").

b) Do you feel you need more environmental information or teaching guidance on environmental issues?

Five response categories emerged from this question. These were:

A. **Need for information**. (e.g. "*Information rather than guidance...we have enough expertise to know how to approach an environmental matter is the factual information that is missing.*").

B. **Need for teaching guidance**. (e.g. "*...it would be nice to have more environmental guidance...*").

C. **Need for both information and teaching guidance**. (e.g. "*...extra training...and what they need to teach.*").

D. **No needs**. (e.g. "*No because I'm a member of several societies...I also read a terrific amount and I love environmental studies.*").

E. **Others**. (e.g. "*...I believe that I need more knowledge as far as children's psychology is concerned...and nothing of the two you mentioned...*").

8. When was the last time you carried out an environmental project or you made reference to environmental issues in your teaching?

Five response categories emerged from this question. These categories were:

A. **This school year**. (e.g. "*About 6 weeks ago on a local study.*").

B. **Last school year**. (e.g. "*...I think last summer...*").

C. **More than a year ago**. (e.g. "Three years ago we did an environmental programme...I did it in collaboration with most of the teachers...").

D. **Never/I do not remember**. (e.g. "*I never had such.*").

E. **Others**. (e.g. "*I will teach this year...*").

9. Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?

Three response categories emerged from this question. These categories were:

A. **In collaboration**. (e.g. "*I prefer to do it with colleagues because it is useful to get lots of ideas...*").

B. **Either way**. (e.g. "*...it would be nice to do it with other teachers...you can draw ideas, support each other...but I wouldn't mind doing it on my own either...*").

C. **Others**. (e.g. "*I think on my own...it's a way of work that expresses me better.*").

10. Have you ever used your school's surroundings in order to teach environmental education?

Three response categories were formed. These were:

A. **Yes, I have**. (e.g. "*....we've done work on plants and animals that live around the school...we have a wildlife garden...*").

B. **No, I have not**. (e.g. "*No, no because it's not my speciality.*").

C. **Others**. (e.g. "*...from the point of view of surveys...*").

11. Are you engaged in any activities or organisations that will enable you to understand environmental education and plan any environmental activities?

Three response categories emerged from this question. These were:

A. **Yes, I'm engaged/in contact**. (e.g. "*...we've been helped by Learning Through Landscapes and also the Northumberland Wildlife Trust.*").

B. **No, I'm not**. (e.g. "*Not immediately...there are other priorities that focusing my mind at the moment...*").

C. **Others**. (e.g. "*The children write their own letters to Greenpeace and Friends of the Earth...*").

12. Have you attended any pre- and in-service training programmes for environmental education?

Four response categories were formed. These were:

A. **Yes, I have attended in-service training programmes**. (e.g. "*...I have attended various ones in the past...they were mainly geography rather than science-based...*").

B. **Yes, I have attended pre-service training programmes**. (e.g. "*Just as part of my course, my PGCE...it was part of what we learnt in science.*").

C. **No, I have not attended any**. (e.g. "*No, but I would be interested if I saw any...*").

D. **Others**. (e.g. "*Going back a few years I must have done, I forgot, I can't remember...*").

13. a) What do you think are the most significant environmental issues affecting the world today?

Three response categories emerged from this question. These were:

A. **Damage to the Earth**. (e.g. "*...the damage we do in to planet earth...the poisoning of the atmosphere...the polluting of rivers...*").

B. **Humans and their attitudes**. (e.g. "*...the society that we live in, we're encouraged just to think of ourselves which makes us very selfish, not care about pollution or making animals extinct...*").

C. **Others**. (e.g. "*Probably the rainforests.*").

b) Why do you think that these are the most significant?

Five response categories were formed. These were:

A. **They affect the planet**. (e.g. "*...because they do affect the planet...*").

B. **They affect people**. (e.g. "*Because it's going to affect every human, all people.*").

C. **They affect both the planet and people**. (e.g. "*...things are going to change dramatically with crops, climate has already started...the Third World is going to have to be examined closely...*").

D. **Highlighted by the media**. (e.g. "*Because they see it on the television awful a lot...*").

E. **Others.** (e.g. "*Because it's the way we are, people do things for themselves...politicians, capitalism are prevailing.*").

14. a) Where do you think your knowledge of environmental matters has come from?

Four response categories emerged from this question. These were:

A. **Personal interest, experiences and love for nature**. (e.g. "*Personal interest...I like geography...*").

B. **Media, books, TV, newspapers, magazines**. (e.g. "*...are just through television and books and papers and things that I read.*").

C. **A combination of sources**. (e.g. "*My love for the environment...but also the media, news...*").

D. **Training**. (e.g. "*...probably some from teachers training...just from my own education...for my A-levels I did geology...*").

b) There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

Four response categories emerged from this question. These were:

A. **The formal sources**. (e.g. "*News and media, television because it is immediate.*").

B. **The informal sources**. (e.g. "*...it is perhaps more effective to talk and interact, react with people...in terms of creating an interest, discussions with knowledgeable people would be better...*").

C. **Equal importance to formal and informal sources**. (e.g. "*...it's a bit of both...*").

D. **Others**. (e.g. "*...I think it depends on their level of interest as to whether...they'd have the personal motivation to find out information...*").

15. a) Do you think we live in an environmentally literate society?

Four response categories emerged from this question. These categories were:

A. **We are literate**. (e.g. "*...our country is quite literate...*").

B. **We are becoming literate**. (e.g. "*I think we're becoming increasingly environmentally literate...purely in terms of communication.*").

C. **We are not literate**. (e.g. "*...I'm not sure that people are very environmentally literate...a lot of people aren't really that bothered...*").

D. **Others.** (e.g. "*I don't know, I don't have any opinion on that.*").

b) What about differences between developed and developing countries?

Three response categories were formed. These were:

A. **The developed countries are more literate than the developing ones**. (e.g. "*...there are great differences between developed-developing countries...due to the advanced state of developed countries which puts the issue 'environment' high on the agenda.*").

B. **The developing countries seem to be more in tune with the environment**. (e.g. "*Developing countries haven't done anything to make air/sea pollution, but yet they are been told to do the same, to pay the same price with the developed countries.*")

C. **Others**. (e.g. "*It's relative to the country we're talking about...*").

c) How do you see the school's role in creating future environmentally literate societies?

Three response categories emerged from this question. These categories were:

A. **School's role is significant**. (e.g. "*Children learn much from their parents, but in terms of factual material and in terms of creating an interest the school has a major role to play...*").

B. **School has to do more than it does now**. (e.g. "*...we need to devise an environmental policy to be able to talk about school's role, each individual teacher might mention it in the way that I've done litter surveys...but not every teacher has done that...*").

C. **Others**. (e.g. "*...I think that outside influences are stronger than school's...society is at odds with schools...I don't think we have the backing and I think that governments are not prepared to take responsibility.*").

All the above categories described the essential elements of teachers' replies to the questions posed to them. By creating these categories it was easier to quantify teachers' replies and to see what teachers emphasise to greater or lesser extent in environmental education. The response categories were introduced in to an SPSS database where statistical analysis was carried out. The English and Greek findings are presented accordingly in the following chapters (7 and 8 respectively).

7. FINDINGS OF THE ENGLISH TEACHERS' INTERVIEWS.

Note: Examples of full interview scripts, one from England and one from Greece are included in Appendix 1 of the thesis.

Preamble.

It was deemed important to present the replies of the teachers' in both countries first and then to present a separate discussion of the replies. Due to the large amount of data, the comparison between the two countries takes place after key conclusions are formed for each country. Hence, chapter 7 presents the findings of the English sample, chapter 8 presents the findings of the Greek sample, chapter 9 discusses the findings emanating from the English teachers and chapter 10 discusses the findings produced by the Greek teachers. Finally, chapter 11 compares the key conclusions of chapters 9 and 10 and compares them to other research studies.

7.1 English teachers' awareness of environmental education.

As outlined in chapter 7, 6 questions attempted to detect teachers' awareness of environmental education. Some of the questions are comprised of two parts. These parts will be presented separately. This serves better the presentation of the findings. Thus, the actual number of the questions will be increased. These questions were:

1. What do you think environmental education is and what should its aims be?
2. How long do you think it has existed as part of the school curriculum?
3. Do you know any important publications, conferences or other initiatives that have determined the character of environmental education?
4. Are there any particular student ages that environmental education should be focused on?
5. What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?
6. What do you think are the best ways of incorporating environmental education in the curriculum?
7. What are the most important aspects of environmental education that young pupils should be taught?
8. How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

7.1.1 What do you think environmental education is and what should its aims be?

Eight teachers (18.6%) believed that environmental education incorporated teaching and learning about the environment in general. They mentioned such things as: *"...teaching the children what state the environment is in now and what they can [do] about it..."* or *"...environmental education concerns the children with everything in the environment..."* or *"...give them an awareness of the factors that are going to affect and influence...their world in the future...an information basis..."* or *"...it's teaching about the countryside and the environment...to increase the children's knowledge of the countryside and their environment around them."*. There was only one definition that mentioned the threefold elements of environmental education, namely FOR, IN and ABOUT the environment. The teacher claimed that: *"...you're getting education for the environment, about the environment and from the environment...to increase your understanding of the world in which you live..."*.

Fifteen teachers (34.9%) based their definition on the need to focus on the local environment. They discussed a definition for environmental education suggesting that: *"...it's learning about the environment locally...the area that we live in...everything to do with the land, buildings, people, even to the extent of social things...to enable them to expand their sort of experience of the world."*, or *"...is making the children aware of where they live...what it is like, how they can appreciate that standard and quality of environment...both school and home and how we have to take care of it..."*, or *"...it's to teach the children about the environment that they live in and how to look after the environment, specifically their own at this age, around the village where we live..."*.

Twelve teachers (27.9%) discussed the notion that environmental education incorporated teaching and learning about both local and distant environments. Eleven of these teachers (91.7%) referred only to the local and distant environments, while the other teacher (8.3%) added in his definition, along with notions of local and distant environments the idea that environmental education dictates ways of behaviour as well. All twelve teachers mentioned such things as: *"...it's just learning about both their own locality and the wider world, how to look after it...also, all of the living and the non-living things that are in their environment around them...teach them about the wider world...even bringing in other cultures...it might take on board citizenship...as well."* or *"...study of your surrounding area...or other*

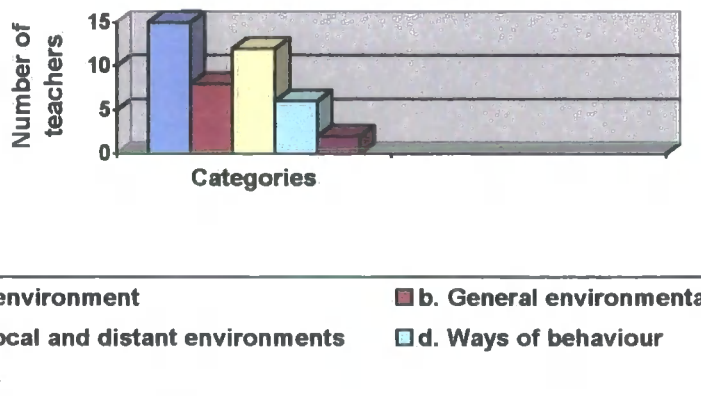
people's areas...to see what is there...compare it with other environments..." or "*...environmental education is the outside world, outside of the school drawing it in to the inside...It's using the outside for education...to improve...children's knowledge of what surrounds them...*".

Seven teachers (16.1%) said that environmental education determined behaviour towards the environment. Teachers claimed that: "*...teaching children to respect the environment around them...teaching them what is wrong with our world and how they can do their bit to improve it...*" or "*It's teaching children to respect the environment...to understand that the world has finite resources...*" or "*Giving the children an awareness of why we need to look after our planet...we need to encourage the children to think about the actions that they take and how affect the environment.*". At the same time, 1 of the teachers in this category argued that environmental education was not only about determining ways of behaviour but it also incorporated teaching and learning about both local and distant environments.

Finally, 2 teachers (4.7%) discussed general matters such as: "*...is preparing children for everything that life puts there...providing them with the skills and experiences to cope with what they find in the wider world.*" or "*...is very much interrelated with the geography, the science, and the technology...it's a very 'hands on' part of the curriculum...to sort of broaden the children's experience so that they do appreciate the environment...*".

There is a graphical representation (Figure1) of the findings just reported.

Figure 1. English teachers' definitions of environmental education.



7.1.2 How long do you think it has existed as part of the school curriculum?

Fifteen teachers (34.9%) claimed that environmental education has always been included in the curriculum. Teachers said that: *"...it's sort of science, geography and history combined...it's always been in the curriculum but maybe not to the extent that it is now...it's become...much prescribed...it was very...limited to the local area...now, we are told that we have to teach...through the National Curriculum, yes."* or *"I think it's been in existence for as long as the school curriculum has been in existence...it started off...as nature lessons...the National Curriculum...brought a structure to what was already in place."* or *"In lots of ways it's been here all the time...it is part of the National Curriculum in the geography curriculum...but teachers have always taught environmental issues...it was either nature study or a study of out of school..."*. Such a view denoted these teachers' beliefs in the multi-disciplinary character of environmental education and at the same time presents environmental education as an inherent part of the school curriculum. That is, environmental education was seen not a separate subject that needed a separate time period to be taught. It is there because it already existed in everything else teachers were doing at school.

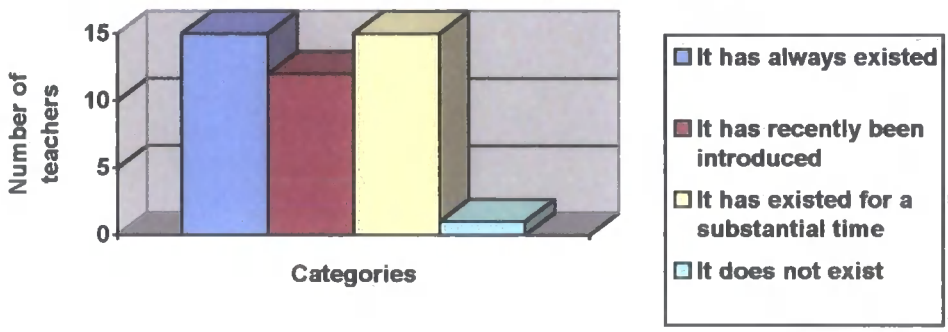
Fifteen teachers (34.9%) thought that environmental education has existed for a substantial time, 10 years and more. They claimed: *"I've been teaching 25 years and I have been doing that for 15 years."* or *"It's existed for quite a while but it would be nature studies way back in the past but as environmental education as such I suppose since the late '70s."* or *"...since 1988...probably was taught before then..."*, or *"...this is my third year and it has always been there since I've started...I would imagine that it would be there even back when I was at school..."* or *"I think it's existed for quite some time even long before the national curriculum came in to existence, right from the earliest times really..."*.

Twelve other teachers (27.9%) claimed that environmental education has only recently been introduced, within the last 10 years. They estimated that environmental education has been in existence: *"Not for long, probably 10 years, that's a guess."* or *"...this is only my sixth year of teaching and it's been for me...from six years. Prior to that I haven't really any idea. I wasn't in education then."* or *"...it's got to be there since the National Curriculum has come in...between five and ten years ago."*, or *"...as long as the National Curriculum has been in...nowadays*

environmental education is written down as law, as part of geography...now there are guidelines...".

Finally, 1 teacher (2.3%) claimed that environmental education did not exist in the school curriculum. He said that: *"...it doesn't exist as part of the school curriculum...it is not essentially involved in the National Curriculum...pulling strands from geography, strands from science and other strands but as a subject or as a programme of study or something in its own right, it doesn't exist.".* Such a view failed to see the holistic character that environmental education aspires to achieve. Figure 2 presents teachers' replies as to how long environmental education has been part of the school curriculum.

Figure 2. Environmental education in English school curriculum.



7.1.3 Do you know any important publications, conferences or other initiatives that have determined the character of environmental education?

Six teachers (13.9%) mentioned local initiatives. Four of these teachers (66.6%) discussed only local initiatives, while the other 2 teachers (33.3%) also mentioned conferences and publications. Teachers claimed such things as: *"...I subscribed to 'Learning through Landscapes'...I've had...liaisons with agencies like the Local Authority Leisure Services Department and things like the Forestry Commission..."* or *"One is the local one, the Lord Mayor's Cup...nationally...we haven't been involved in conferences..."* or *"...Durham has individual competitions...that encourages schools to take part in...last year there was a competition to design and build a butterfly garden..."* or *"...an area near here called the Scrambles which the local council have taken over as an area of natural beauty and conservation...where you can take children...and it has a wide diversity of habitats...there's the global environment thing that's being taken place in, can't remember exactly where,*

somewhere in Asia where they've been discussing global warming...". It is encouraging that teachers were aware of local initiatives because they can and they have worked with them in order to practice environmental education.

Eleven teachers (25.6%) were aware of publications. Seven of them (63.6%) talked only about publications. Three of them (27.2%) talked about organisations as well, and 1 teacher (9%) talked about local initiatives too. They actually said: *"...the Northumberland Wildlife Trust...we also belong to...Learning through Landscapes that, really, concentrates on making environmental issues meaningful to school and...big organisations like Greenpeace send posters and packets of information."* or *"...I know the book we had for our course which is the 'Environment in question'...by Joy Palmer...there used to be a magazine and there maybe still is called 'Green Teacher'...all of the major environmental organisations like Greenpeace...Friends of the Earth...they all have something to say about what they think you should be teaching..."* or *"...the magazine from the Royal Geographical Society...concentrating on the ideas of sustainability."* or *"...the Council for Environmental Education has brought out a brochure...on environmental education...there's Learning through Landscapes which is interested in developing the environment..."* or *"I've got a publication...it's the World Wide Fund environment outleaf in one book...it's mainly climate and weather but it's also looking at how environmental change can affect that..."* or *"Newcastle have Agenda 21 and literally all I have had from that is a booklet, there's been no office of training or anybody coming in to talk to the staff about it...for sustainability...it's more an information pack...".* Some of these publications such as 'Learning through Landscapes', 'Curriculum matters series', 'Primary Geography', 'Green Teacher' were specially designed for teachers, to help them practice environmental education. The rest of the publications mentioned, such as the book 'The Environment in Question' by Cooper and Palmer (1992), 'Newcastle-Agenda 21', National Geographic, 'The World Wide Fund for Nature' and the Royal Geographic Society magazine, were publications which provide general knowledge on various environmental issues.

Seven teachers (16.3%) talked about organisations. Three of them (42.8%) mentioned only organisations, 3 teachers (42.8%) talked about publications as well and 1 (14.2%) mentioned conferences too. Teachers said that: *"...every year there is*

a national conference...Birmingham it's held in...Societies like World Wide Life with the panda, the news, the media..." or "*...World Wide Fund, National Trust, Keep Britain Tidy...*", or "*...organisations like Save the Whale or Greenpeace...*" or "*We write letters to different organisations...as a school...the usual Greenpeace, Friends of the Earth that each one of those has its own initiatives that each is trying to lobby parliament...*".

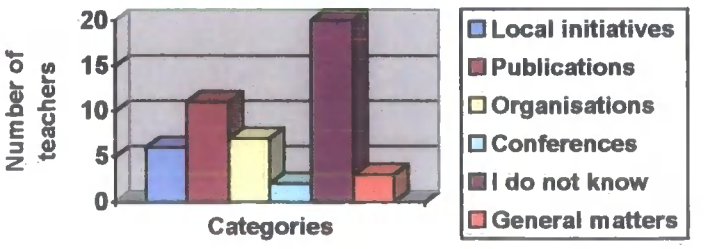
Two teachers (4.6%) talked about conferences and events concerning environmental education. Their answers have already been mentioned as they additionally referred to local initiatives and organisations. One teacher mentioned the conference that took place in Asia on global warming and the other teacher talked about a conference that takes place every year in England which concerns teachers and environmental education.

Twenty teachers (46.5%) answered that they did not know anything in particular. Their responses included: "*Not really...*" or "*No*" or "*None that I can think of.*" or "*Obviously there's been some that I haven't been involved in, so, no, not really.*" or "*...I don't know any of, no and...none has made me specifically aware of any publication.*" or "*I'm not very up to date with it, no*" or "*No, I don't know anything about.*".

Finally, 3 teachers (6.9%) talked about general matters. They mentioned such things as: "*...just these world studies where the children get together and they talk about how they think their environments going to be in few years' time...*" or "*...I sat on a working party...to produce a leaflet and to bring an awareness of Europe to schools...*" or "*I know that there is a set of in-service training courses available to teachers...*".

Figure 3 presents teachers' answers. It is clear that a majority of teachers were unaware of organisations, of conferences, of publications and of local initiatives.

Figure 3. English teachers' knowledge about environmental education.



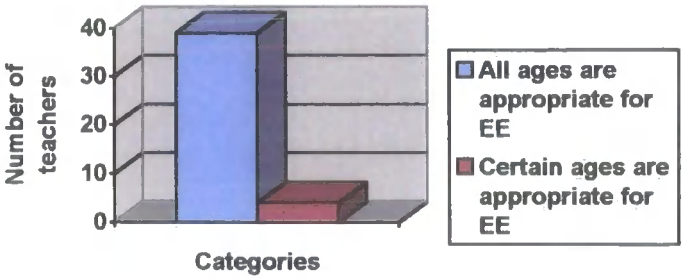
7.1.4. Are there any particular student ages that environmental education should be focused on?

Thirty-nine teachers (90.7%) claimed that all ages were appropriate for participating in environmental education. They suggested that: *"...the earlier the children begin to observe...their environment...the better."* or *"...it's important to all of our ages...we start with the really...young ones...as soon as they come through the door in the nursery..."* or *"...I think it should start from very young children..."* or *"...I think from an early stage, from the nursery right through...from the nursery up..."*.

Four teachers (9.3%) believed that there were certain student ages which were more appropriate for environmental education. They mentioned: *"Yes, 11 to 16, because they become more worldly and they're formulating their own personal philosophy of life...they decide more between 11 and 16 than before."* or *"...between 7 to 11 it's very important because that's the age when they're interested and you can grab them."* or *"...when the children are 10 to 11 then I think they...are ready to take on these concepts...global warming, etc...when they're younger, 7 down...it's too young for them to really understand...7 to 8 years old can understand about litter and graffiti and vandalism."*.

The findings which emerged from that question are presented in Figure 4 where teachers' replies are presented.

Figure 4. Environmental education and pupils' ages for English teachers.



7.1.5 What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

Twenty teachers (46.6%) claimed that primary school pupils should be taught about the local, immediate environment. Fifteen of them (75%) talked only about teaching the local environment, 3 of them (15%) mentioned the teaching of general environmental issues as well, and the other 2 teachers (10%) included also developing positive attitudes towards the environment. Teachers claimed: *"...looking at a local farm...looking at the local building...we've got wonderful surroundings here...taking care of your surroundings, being careful within the environment..."* or *"...look after the world in which they live, their local area...how can that local area be improved, what they like, what they dislike about their area..."* or *"...they should know what's actually in their environment for a start, their locality...about looking after it...about things like pollution...as they get older then you introduce things like...pollution of rivers, pollution of the air..."* or *"...focus more on their local environment...as they get older towards the juniors you can probably bring in the world issues...make them aware of the environment, the community and any major issues such as...pollution..."* or *"...the rainforests...I've done recycling...issues that they hear about as well as I hear about in news and things that come out of the programmes of study...I would teach the local environment and different environments..."*.

Nineteen teachers (34.2%) discussed that the content of environmental education in the school curriculum should focus on teaching about general environmental issues. Eight of them (42.1%) thought only general environmental issues. At the same time, 8 other teachers (42.1%) included in their discussion the development of positive attitudes towards the environment. The other 3 teachers

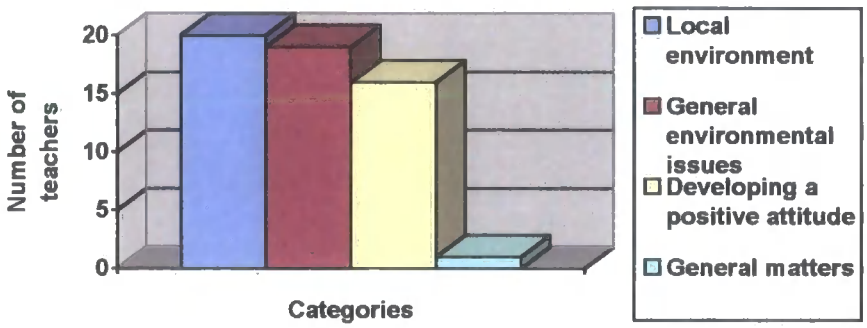
(15.7%) included the local environment. Teachers claimed such issues as: *"...things like pollution, acid rain, how we can affect our environment, littering in the sea, on the earth, how to look after the world around them..."* or *"...it's all about attitudes and working towards developing a positive attitude to their environment and realising things like vandalism and graffiti...ways to improve that...recycling newspapers and cans and...being aware of acid rain and their contributing to polluting...walking to school rather than taking the car...in the primary school it's just to promote positive attitudes and to realise that they have an affect on their environment."* or *"...looking after plants and animals in their area and looking after recyclable things...the world's resources and also consider pollution as well...how we're polluting our world, our environment."*. The kind of general environmental issues they mentioned when discussing the school curriculum content for environmental education were: litter, pollution, flora and fauna, recycling, acid rain, vandalism, graffiti, nature of school grounds, world's resources, greenhouse effect, tropical rainforests, global warming, underprivileged environments, rubbish, packaging and different materials, mini-beasts, deforestation, use of resources, endangered species, Third World issues, habitat protection, car fumes and conservation. All these cover a great variety of issues, which can be taught through science, through geography or through other subjects. Litter, pollution, rubbish, flora and fauna were the most often-mentioned issues that, sometimes, were also included in teachers' discussion when talking about the locality.

Sixteen teachers (37.3%) considered that the content of environmental education should be about developing a positive attitude towards the environment. Six of them (37.5%) discussed only that, whilst 8 (50%) teachers claimed that, apart from developing a positive attitude, environmental education should also include general environmental issues. The other 2 teachers (12%) added the local environment. Teachers mentioned such matters as: *"...how we look after our things in school, we have a pond and the creatures that live in the pond what they need...that our survival often depends on their survival..."* or *"...I think mainly care for things like avoiding pollution, understanding the impact of litter, those sort of aspects are most important for our children, get them in to good habits."* or *"...they should be taught to respect their environment, look after it and know the problems that can occur if they pollute or if they harm their environment..."*.

Finally, 1 teacher (2.3%) mentioned general matters such as: *"...about the effects of human activity on the environment...about the way the environment works..."*.

Figure 5 depicts teachers' views concerning the school curriculum content of environmental education.

Figure 5. English teachers' views on the content of environmental school curriculum.



7.1.6 What do you think is the best way of incorporating environmental education into the school curriculum?

None of the 43 teachers considered that environmental education should be as a subject in its own right. Seventeen teachers (39.5%) claimed that environmental education could be realised through separate subjects. Teachers said that: *"...because of the constraints of time now...you can teach it through geography and through science...I don't really think it needs to be a separate subject on its own, it comes across in so many other different areas...it's much more natural to do it this way."* or *"...having it as a separate subject...it won't be time in the curriculum...it has to be incorporated in to what we're already doing, in to geography, in the science..."* or *"...it should be part of geography but obviously we're looking at moral issues as well...we don't have time in the primary school curriculum to have another subject on its own..."*. These teachers suggested the infusion model for implementing environmental education in the school curriculum. In this way, various disciplines offer opportunities for teachers to discuss environmental issues.

Twenty-two teachers (48.8%) believed that environmental education could be best incorporated into the school curriculum through topics. Teachers claimed such ways as: *"...it should be incorporated into a general topic...in the UK you still have*

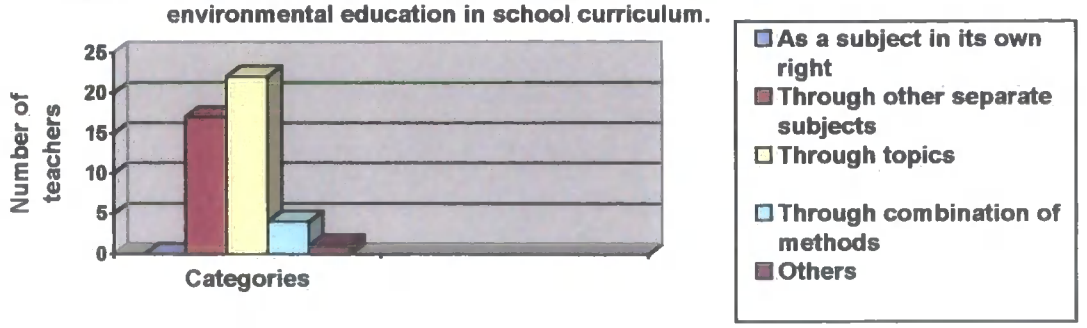
the flexibility to...make the national curriculum fit in to your topics, even if you have to deliver certain aspects of the national curriculum..." or *"I don't like separate subjects...you've got to make it a holistic approach and they've got to be able to transfer the knowledge of one subject to the others, therefore I think it's got to be topic based..."* or *"More part of a general topic because I think they can get more of a flavour for things if they connect it with other issues...geography, science, art, design technology..."*. These teachers suggested the inter-disciplinary model, which calls for the collaboration of different disciplines in order to investigate an environmental topic.

Four other teachers (9.3%) thought that environmental education could be best incorporated through a combination of methods. Teachers said that: *"We do it as a separate subject and it works quite well...but I think that it's good to bring it in to other things as well because it does have relevance..."* or *"...you could...do it as a separate subject but then you would have to bring your geography and your science in...so I think either way round...both ways..."* or *"It can be both. I've done it as a general topic and I've incorporated in to my science work, to my geographical work, to some extent history...I found it profitable both ways..."* or *"I think it should be both...I think it's a two way process...it can be both linked and taught separately."*.

Finally, 1 teacher (2.3%) who had already discussed topic-work, included general matters as well. He said: *"I think...a bit of both really...in an ideal world it would come through such topics as 'Looking at Water' and 'Looking at the weather'...but I think there is a case and a place for teaching specifically environmentally related issues, for example I've taken children to the nuclear power station at Hartlepool...and that in itself is an example of an environmental lesson..."*.

Figure 6 exhibits teachers' views on how environmental education best fitted into the school curriculum. It is evident that topic-work was the most popular way of implementing environmental education in the school curriculum.

Figure 6. English teachers' views concerning the incorporation of environmental education in school curriculum.



7.1.7 What are the most important aspects of environmental education that children should learn?

Ten teachers (20.9%) discussed knowledge about the local environment. Eight teachers from this category (77.8%) considered only the local environment, while the other 2 teachers (22.2%) also discussed the teaching of general environmental issues and the inculcation of values as important areas of environmental education. They said such things as: *"...I would stress local environment because it has fun..."* or *"...they should know about the town that they live in...their own area...their own town streets, the people who work in them...also, maybe...plants and wildlife that are sort of locally around. It should all be centred very close to home."* or *"...mainly where they live...what's like where they live..."*, or *"In primary school...I think that the local ones are more important at this age..."*.

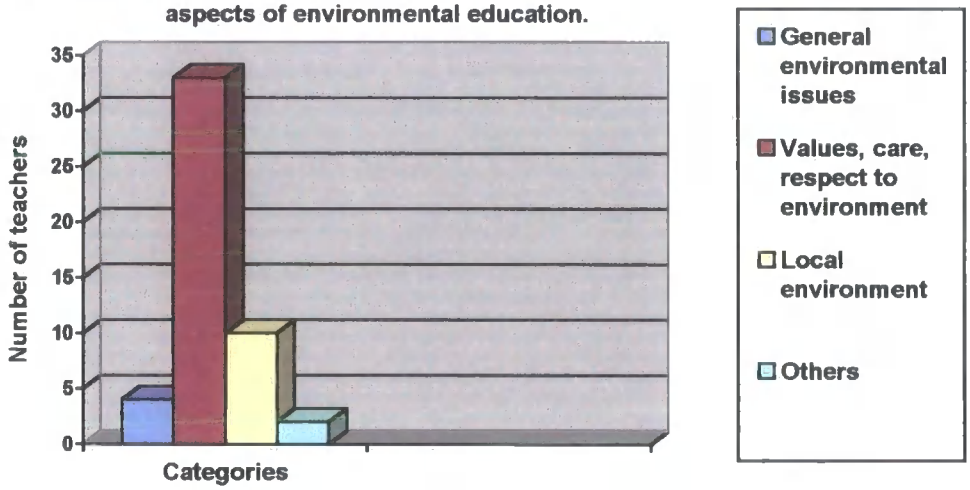
Thirty-one teachers (72%) reckoned that the most important aspect of environmental education young children should be taught about concerned values, caring feelings and respect towards the environment. Twenty-nine of them (93.5%) considered only that, while the other 2 teachers (6.5%) also referred to knowledge of the local environment and knowledge about general environmental issues respectively. They mentioned such things as: *"...care of living things really..."* or *"...looking after the environment for themselves and for future generations..."* or *"...to take care of their environment and to be critical when it doesn't come up to our expectations...not to leave the litter around...start realising that they can affect not only their own immediate environment but...wherever they are..."* or *"About protecting their environment that they're in...being aware of living things and treating them with respect."*.

Four teachers (9.3%) regarded the teaching of general environmental issues as the most important aspect of environmental education. Half of them discussed only general environmental issues and the other half included the local environment and the inculcation of values towards the environment. They claimed such things as: *"...safety things...things like dealing with road traffic and things to do with litter, things that you should and shouldn't pick up..."* or *"Pollution, definitely."* or *"...it's care of other living things...the understanding...that everything has a purpose...in the science side of the curriculum we often develop the children's understanding of the...raw materials, scarce resources...pollution..."*.

Finally, 2 teachers (4.6%) discussed general matters such as: "*...the effects of human beings on the countryside and in the world and what the consequences are...*" and "*...to learn what damage has been done to the earth already and what they can do about it*".

Figure 7 represents teachers' replies. It is clear that teachers rated the inculcation of positive values towards the environment as the most important aspect of environmental education, while the local environment was rated as the second most important.

Figure 7. English teachers' ideas concerning the most important aspects of environmental education.



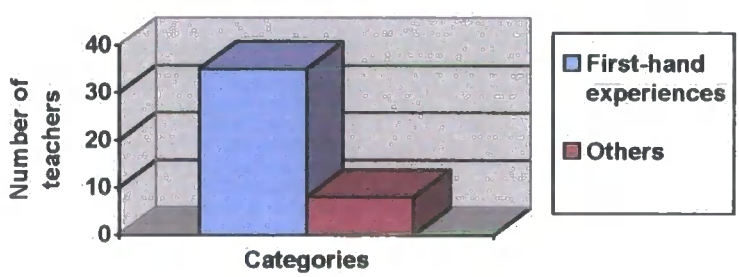
7.1.8 How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

An overwhelming number of teachers, 35 representing 81.4% discussed the importance of first-hand experiences (see Figure 8). Teachers claimed: *"By visits...it's got to be practical activities where they can actually have 'hands on' experience...as far as possible."* or *"...hands-on...rather than just telling them this is going to happen...they've had things like collecting newspapers and collecting cans and recycling them, they've been out in to the village and they've collected rubbish...they've looked in the environment that they live in."* or *"We use the environment by taking them out...going outside looking at our school, it has to be practical...have visits to the farm and to the coast and river..."*.

Eight other teachers (18.6%) discussed general issues such as: *"...use a legitimate scientific approach, more quantifying approach...with statistics that they've got themselves about their own area...photographed it, drawn, written about it, put it down in tables and then compared the same areas at different times..."* or *"...in maths we do graphs, block graphs where we look and observe how busy our road is outside with lorries, buses, cars..."* or *"...through drama...getting play groups to play actors to come in and present a particular issue..."*.

Figure 8 depicts teachers' ideas on presenting environmental education to pupils.

Figure 8. English teachers' ideas on presenting environmental education to pupils.



7.2 English teachers' motivation to teach environmental education .

Six questions investigated teachers' motivation to teach environmental education. Again, as in the 8.1 section, the questions which have two parts will be presented separately. These questions were:

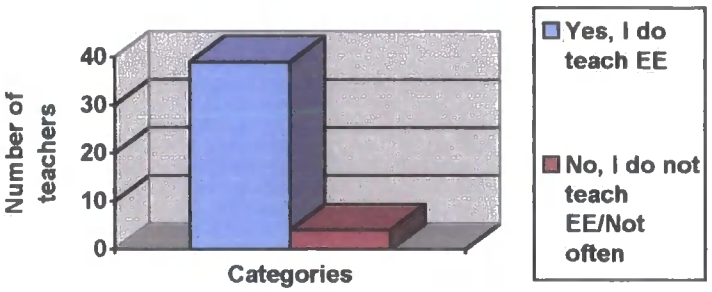
1. Do you teach environmental education?
2. Do you feel you need more environmental information or teaching guidance on environmental issues?
3. When was the last time you carried out an environmental project or you made reference to environmental issues in your teaching?
4. Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?
5. Have you ever used your school's surroundings in order to teach environmental education?
6. Are you engaged in any activities or organisations that will enable you to understand environmental education and plan any environmental activities?
7. Have you attended any pre- and in-service training courses for environmental education?

7.2.1 Do you teach environmental education?

The first question asked teachers whether they taught environmental education. Figure 9 presents teachers' replies. Thirty-nine teachers (90.7%) replied positively. Their answers were as follows: *"Within the curriculum that we have, yes, but it is just part of the general...curriculum...I actually teach more science than environmental studies..."* or *"Yes, very much so."* or *"Not as a subject...we have some topics that have more...emphasis on the environment..."* or *"I do as part of topics, yes."* or *"It's not taught as a separate subject...incidentally in most of the subjects, in most of the topics that we do, there are some as a little part focused on environmental issues."* or *"Yes, yes, we've got to...it is part of the National Curriculum and the geography...it is a statutory duty that you teach the National Curriculum..."* or *"Through science and geography, yea."*. It is evident that from the teachers who said that they taught environmental education, it was delivered either through other subjects such as geography, science, history, religious education, personal and social education or through topics.

Four teachers (9.3%) said that either they did not teach environmental education or they did not do it that often. They mentioned such things as: *"No"* or *"Not often...I usually get involved in some of the local studies..."* or *"A little, not very much."* or *"Not as a definite topic...I haven't [taught] this year, I have not taught any environmental..."*.

Figure 9. English teachers' practices of environmental education.



7.2.2 Do you feel you need more environmental information or teaching guidance on environmental issues?

Fifteen teachers (34.9%) believed that they needed more information. They actually said: *"...I feel whatever information is available is going to be helpful...I wouldn't really like teaching guidance because I like to do things in my own way...it's nice to have a bit of flexibility..."* or *"...any information where supplements what we have is worth [while]...I never say no to...more information...we probably don't have anything that is specific to environmental education and we should have."* or *"More...resource books and things so that we can access it easy...without overloading because it's such a wide issue...we can do with updating ourselves..."*.

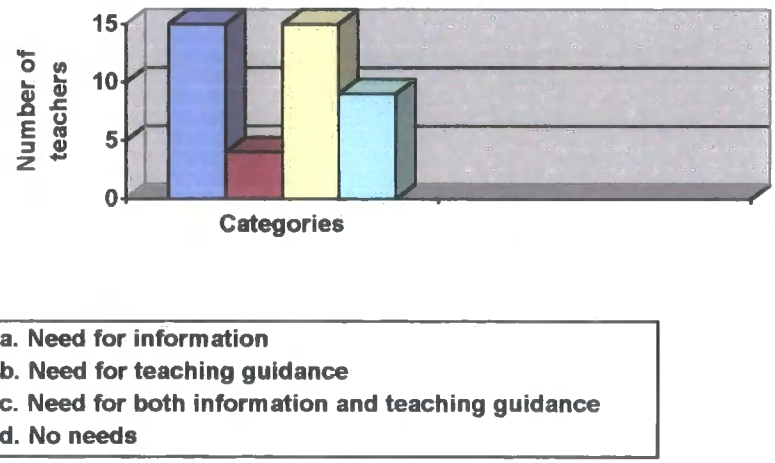
Four teachers (9.3%) believed that they needed teaching guidance. Teachers mentioned that: *"...it would be nice to have more environmental guidance...whatever we get to teach has to be very succinct, very focused so we know how to teach without wearing us down with too much painful work..."* or *"...I think we have quite a wealth of information handed to us, particularly through the local councils...we need more teaching guidance...the manner which we put things across some times, we need some guidance on that..."* or *"There has been very little in the way of teaching guidance and I would greatly appreciate in-service training in this area..."*.

Fifteen teachers (34.9%) claimed that they needed both information and teaching guidance. Teachers discussed: "*...I think a lot of what we have now is outdated...a lot of teachers now haven't been through the environmental education training...so...extra training...and what they need to teach.*" or "*...I think we could all benefit from some in-service experience, training and perhaps somebody coming in with ideas to help put, you know, environmental issues over to young children...*" or "*Both. The knowledge, the in-depth knowledge but also making it enjoyable and exciting and memorable, so, both.*".

Nine teachers (20.9%) claimed that they had no needs at all. They claimed: "*No, because I'm a member of several societies...I used to be a counsellor for where I live, I also read a terrific amount and I love environmental studies.*" or "*I don't think so because I mean the world of education is awash with publications and ideas and suggestions and activities...there is enough now for teachers to focus upon and deliver to children very effectively.*" or "*Not me personally because as I say I've sort of worked for an environmental organisation and I've got good training...I'm always responsive to new ideas but I wouldn't say that I need to go on a long course on environmental education, I do feel I've got some expertise myself anyway.*".

Figure 10 describes the kind of needs that teachers felt they had in environmental education. The need for information and the need for both information and teaching guidance prevailed over the need for teaching guidance only.

Figure 10. English teachers' needs in environmental education.



7.2.3 When was the last time you carried out an environmental project or you made references to environmental issues in your teaching?

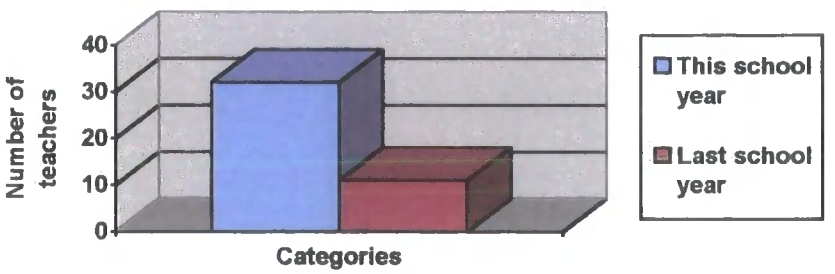
Thirty-two teachers (74.4%) said that they had made such references that school year. They claimed things like: *"About six weeks ago on a local study."* or *"Last term, where we took animals that visit our school and how we could feed them...we fed birds and looked at birds...we also looked at the trees around our school and why they had black spots on them and we found that some of the trees were diseased due to pollution"* or *"Our topic at the moment is transport...we've been walking around the village and looking for different materials and seeing that sort of thing."* or *"Last month...I did this environmental project 'All about the school playground'...limitations and problems we have with our playground..."*.

Eleven other teachers (25.6%) replied they had made such references a year ago. They said: *"...I think last summer, when I did sort of a...major study...plants and animals within the school."* or *"Last summer...we entered the Lord Mayor's Cup...it was a big project...the topic was around litter..."* or *"Summer term...That was the local environment and we looked at this area and the Whitley bay..."* or *"...last year...we did a topic on rivers...how were rivers...created and then it goes to the sea and pollution of the sea and pollution of rivers..."*.

None of the teachers said that they had never had made such references or that the last time they could remember was more than a year ago.

Figure 11 describes teachers' most recent practice of environmental education at the time that the interview took place.

Figure 11. English teachers' most recent practices of environmental education.



All the above support teachers' claim that they taught environmental education. In addition it supports earlier expressed views that teachers had about the content of environmental education where they mentioned local and distant environments. School premises proved to be a popular place to exercise environmental education,

since teachers used it quite a lot in order to teach, for instance, about plants, animals, birds, trees. This is reinforced by the fact that 45.2% of those who admitted using their school's surroundings also believed local environment should be an element in the environmental education curriculum.

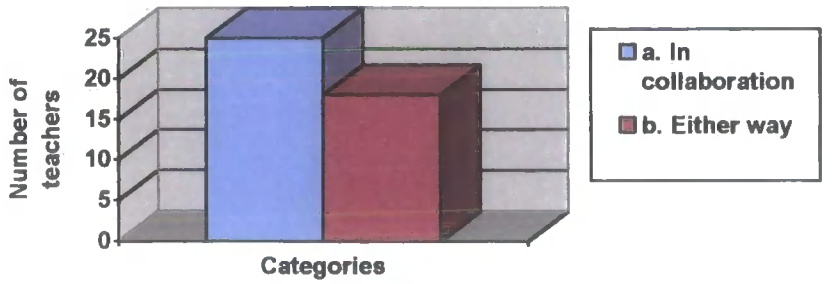
7.2.4 Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?

Twenty-five teachers (58.1%) claimed that it was better to work in collaboration. Teachers endorsed their views by saying: "*...I prefer to do it with colleagues because it is useful to get lots of ideas...*" or "*...with my colleagues because I don't think I personally would have enough information...my actual knowledge is probably quite limited...*" or "*...it's better in a group because you can bounce ideas of people and you can get suggestions from other people.*" or "*...everybody has different ideas and everybody can expand ideas...you had not thought of.*" or "*Collaboration. When you're doing anything in the environment, if it's going to be practical, you need more than one adult to supervise the children...*".

Eighteen other teachers (41.9%) claimed that they would not have any problems working either in collaboration or on their own. These teachers claimed that: "*...with other teachers...but I wouldn't mind doing it on my own either, I'm quite happy doing both.*" or "*I've done both...my own knowledge is very good and I'd be happy to work and have done with other people.*" or "*...on my own presuming that I'm teaching it right...it's good that you do have other people involved with you but I don't think it's always necessary...*" or "*I would feel more confident to do either if I knew exactly what I was supposed to be doing.*".

Figure 12 indicates the number of teachers who preferred working in collaboration with a colleague or on their own.

Figure 12. English teachers' working preferences.

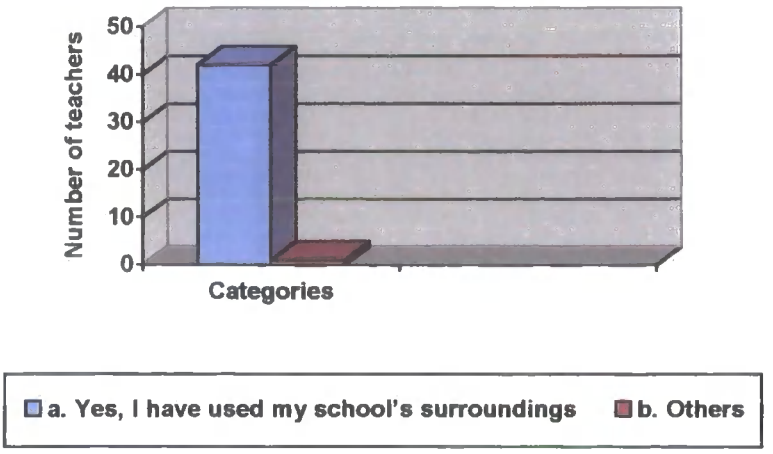


7.2.5 Have you ever used your school's surroundings in order to teach environmental education?

Forty-two teachers (97.7%), an overwhelming majority claimed that they had used their schools' surroundings (see Figure 13). They mentioned such things as: "*...we've done work on plants and animals that live around the school...we have a wildlife garden...lots of different kinds of wild flowers...we have a pond...we planted a lot of hedges around the school which, obviously...hides birds and spiders...*" or "*...I have, yes...we built a pond and a rock garden...*" or "*Yea...we use the village, we use Yarm because that's a different place all together [to] town, we use the immediate environment, we've done weather studies outside and collected all the data from that and we have the wildlife garden...to look at mini-beasts...at the trees around us...*" or "*Yes, we did, with part of our topic last year...the clean team...with all around litter and rubbish...*" or "*All the times, yes, always...it's a basic resource.*".

None of the teachers claimed that they did not use their schools' surroundings, while 1 teacher (2.3%) referred to general issues as she said: "*We have from the point of view of surveys...*".

Figure 13. English teachers' use of their school's surroundings.



7.2.6 Are you engaged in any activities or organisations that will enable you to understand environmental education and plan any environmental activities?

Six teachers (14%) said that they were so engaged. They mentioned such things as: "*In terms of the local area I do have some connections with people in planning departments or the local politicians which provide us with information on that.*" or "*...I'm a member of Green Fingers...it's a local [group] and they advertise locally...places you can go to and then you can bring that information back in to school, very good...*" or "*Yes...we've been helped by Learning through Landscapes and also the Northumberland Wildlife Trust.*".

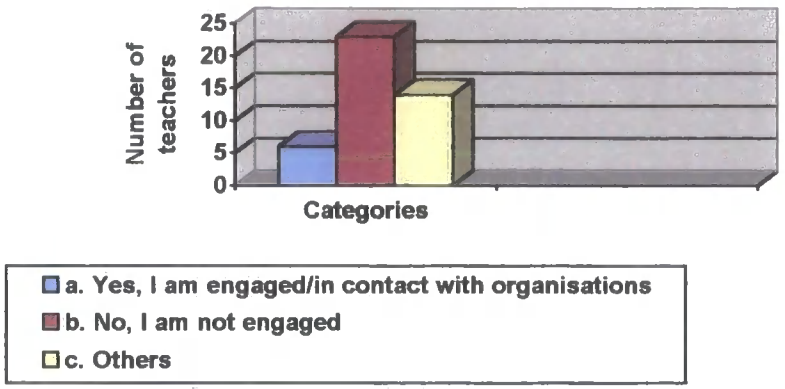
Twenty-three teachers (53.5%) said that they were not engaged in any organisations or other initiatives. They actually claimed that: "*No.*" or "*I'm not engaged in any activities, no...*" or "*No, I'm not involved with anything.*" or "*No, no...I get the information I need from books, from my own knowledge, videos, just the general area, just what I already know.*" or "*Not anything specifically to do with environmental education...The school...get magazines...general but covering environmental aspects.*".

Finally, 14 teachers (32.6%) discussed general matters such as: "*Not now but I was at my previous school...it was the Durham wildlife Trust and we planted trees in the school grounds and also made a wildlife pond and a wildlife garden...*" or "*Not specifically, no... every so often we have contact with somebody in the community...*" or "*...the person who look after the local Newton Hall junction and the...teacher from the comprehensive school who deals with environmental education...*" or

"*...we're a member of the Base Science Club but we don't actually do very much with that...we're not really involved in it...*".

Figure 14 indicates that most teachers had no contacts with environmental organisations.

Figure 14. English teachers' engagement with environmental organisations.



7.2.7 Have you attended any pre- and in-service training programmes for environmental education?

Eight teachers (18.6%) said that they had attended in-service training programmes. Figure 15 sets out the number of teachers who had attended either pre- or in-service training courses or had not attended any. The training programmes they mentioned were about: "*Yes, some organised by the L.E.A...some by local industry...and some by the Royal Geographic Society...in the case of the Geographical Society, it was more in terms of sustainability...in terms of the local industry, that was connected with a local area for wildlife protection...in terms of the L.E.A...[it was about] bird protection but, also, the local coast life and the river...*" or "*...I have attended various ones in the past, not over the past year...they were mainly geography rather than science based courses, the last one must have been five years ago.*" or "*Not recently...the last one I have attended was just under a year ago and it was about Drug Awareness.*" or "*...I went on a couple of courses...within the authority...but it was all to do with creation of a pond, so it was a very specific issue.*" or "*...many years ago I was on a course looking at the environment...it was*

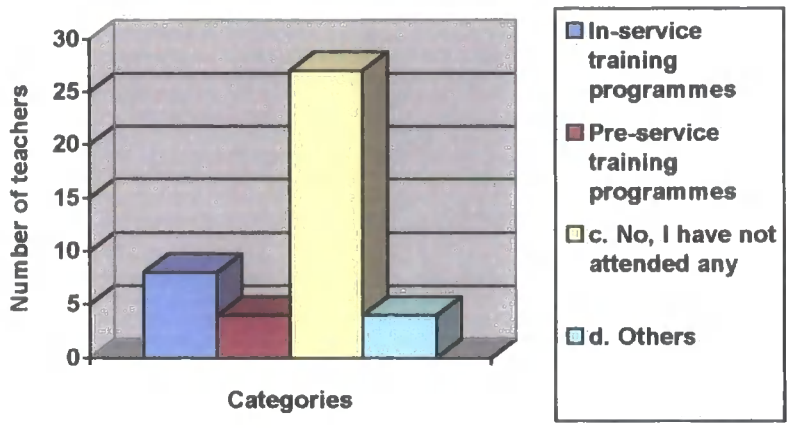
looking at harmed life...land reclamation and the use of land around...fifteen years ago...".

Four teachers (9.3%) mentioned that they had attended pre-service training programmes. The kind of programmes they had attended were: "*...I did four years of it at university so, but since then not really...*" or "*Only so far as they were part of the PGCE...it was mainly concerned with things like mini-beasts in school, in class, using invertebrates and how they might be treated and cared [for], again the care respect...you tend to rely on other members of staff who have that particular speciality to give you the information if you don't have it yourself...*", or "*...pre-teaching I have...there were some aspects devoted [to] environmental education...under other headings but there was definitely environmental education.*".

Twenty-seven teachers (62.8%) said that they had not attended any such in- or pre-service training programmes for environmental education. They mentioned such things as: "*No...I know we've got a book that is available for courses but again the constraints of money in the school doesn't always allow you to go on the courses.*" or "*Not really...*" or "*...I've been...to lots of geography courses...they're not courses that are labelled environmental education, they're all to do with National Curriculum geography in the primary school...*" or "*Not specifically environmental education...I've been on two geography courses but not environmental geography.*" or "*No...there's bound to be various courses...in the geography or science section...*" or "*No...no, I don't think that there's any training...*".

Finally, there were 4 teachers (9.3%) who discussed general matters such as: "*No, not lately. Going back a few years, I must have done, I forgot, I can't remember...*" or "*The only ones that I have attended were when I worked in a different Education Authority and I had responsibility for a large project which involved regenerating the school grounds...*" or "*Just as part of my course my PGCE...it was part of what we learnt in science.*".

Figure 15. English teachers' preparation in environmental education.



7.3 English teachers' general environmental awareness.

Three questions investigated teachers' general environmental awareness. The questions which are comprised of more than one part will be presented separately. These questions were:

1. What do you think are the most significant environmental issues affecting the world today?
2. Why do you think that these are the most significant?
3. Where do you think your knowledge of environmental matters has come from?
4. There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?
5. Do you think we live in an environmentally literate society?
6. What about differences between developed and developing countries?
7. How do you see the school's role in creating future environmentally literate societies?

7.3.1 What do you think are the most significant environmental issues affecting the world today?

Thirty-seven teachers (86%) claimed that the most significant issues affecting the world today are those which damage the earth. They mentioned various issues such as: "*...the damage we do in to planet earth and what form of damage...what are*

the implications caused in short term and long term...the poisoning of the atmosphere...but also the polluting of rivers and waters." or "*...there's the greenhouse effect and global warming...a major issue in the news...there's pollution...*" or "*Global warming is the main.*" or "*...global warming...and what do we do with all the rubbish that we're accumulating.*" or "*...the global warming issue...*" or "*Pollution, population and use of resources...I think they are about the main ones that I would think were important...*" or "*Pollution, air pollution, sea pollution...climatic changes...use up all the earth's resources.*" or "*...the problem of using natural resources in a very non-planned and careless way. Also, the extinction of certain species...*". 51.3% of the teachers who claimed that damage upon Earth was the most significant environmental issue also discussed general environmental issues as being appropriate for the content of environmental education in the school curriculum. However, while the number of environmental issues they mentioned as being of great significant was large with a considerable range, (e.g. greenhouse effect, waste management, deforestation), the number of environmental issues they included as appropriate content for environmental education in the school curriculum was limited. Pollution, atmospheric and water pollution were the main issues teachers believed should form part of the curriculum for environmental education. Third World problems, global warming, deforestation and abuse of resources were rarely mentioned. One can attribute this to various factors, such as lack of pertinent knowledge, something which was mentioned by teachers when they claimed that they preferred working in collaboration with their colleagues rather than on their own. Moreover, it could be attributed to the fact that teachers believed that the age of the pupils they worked with did not allow them to teach such issues. However, since the vast majority of teachers (90.5%) supported the contention that environmental education was appropriate for all student ages, it is fair to say that simplified versions of such issues could be taught to pupils of young ages.

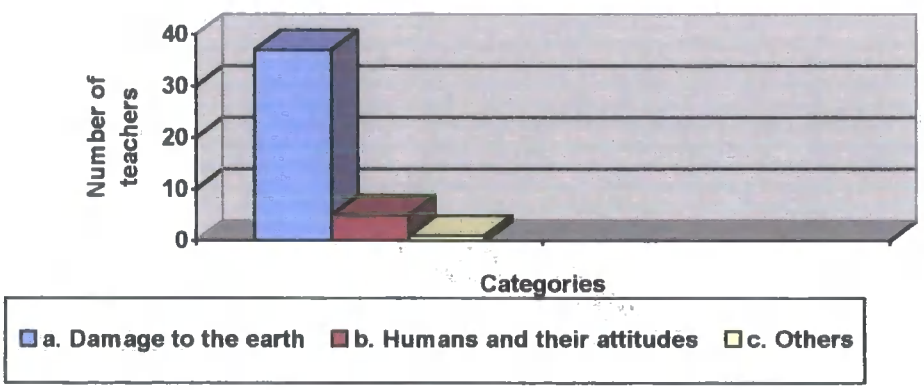
Five teachers (11.6%) claimed that the most significant issue affecting the world today was humans and their attitudes. They claimed: "*...I think the society that we live in, we're encouraged just to think of ourselves which makes us very selfish, not care about pollution...*" or "*...I think people tend to think about they're all right today but they don't really think about the future and how it's going to affect their children...I think people are generally selfish...they don't realise the importance,*

that I think is the biggest problem." or "*...a lot of things have to do with people...that sort of capitalistic exploitation of people...although that's not physical environmental issue, it's people...*" or "*Man's greed in depleting natural resources...the high standard of life in developed countries...*". Thus we see that small percentage of teachers (11.6%) has identified the human being as the core problem of today's troubles. Taking into consideration the fact that 72% of the teachers discussed the inculcation of values and caring feelings towards the environment as the most significant aspect of environmental education, it is contradictory that only 16.1% of them defined humans and their attitudes as the most important environmental issue affecting the world today.

Also, 1 teacher (2.3%) discussed general matters such as: "*Probably, learning how to look after the environment in a way that you keep things tidy, not litter, recycling things...*".

Figure 16 shows how teachers considered damage to the earth as the most important issue affecting the world today.

Figure 16. English teachers' ideas about the most important environmental issues affecting the world today.



7.3.2 Why do you think that these are the most significant?

Five teachers (12.8%) claimed that such environmental issues (the ones described earlier) affected the planet. Teachers said that: "*They will have an impact on the future of the planet.*" or "*Because it's going to affect the whole world.*" or "*...because they do affect the planet...they have the most effect on planet, they have [a] drastic influence on the planet, they are world-wide involving all countries.*".

Eleven teachers (28.2%) attributed their importance to the consequences that such environmental issues had upon people. Teachers endorsed their views by saying: "*Because it's going to affect every human, all people.*" or "*Because they affect the most people.*" or "*Because you're just creating problems for yourselves...if we want to sustain [the] population, we should make sure we budget for future generations.*" or "*If we use the raw materials and they disappear, we can't replace them...*" or "*Because it slowly destroys what we...all we've got really.*".

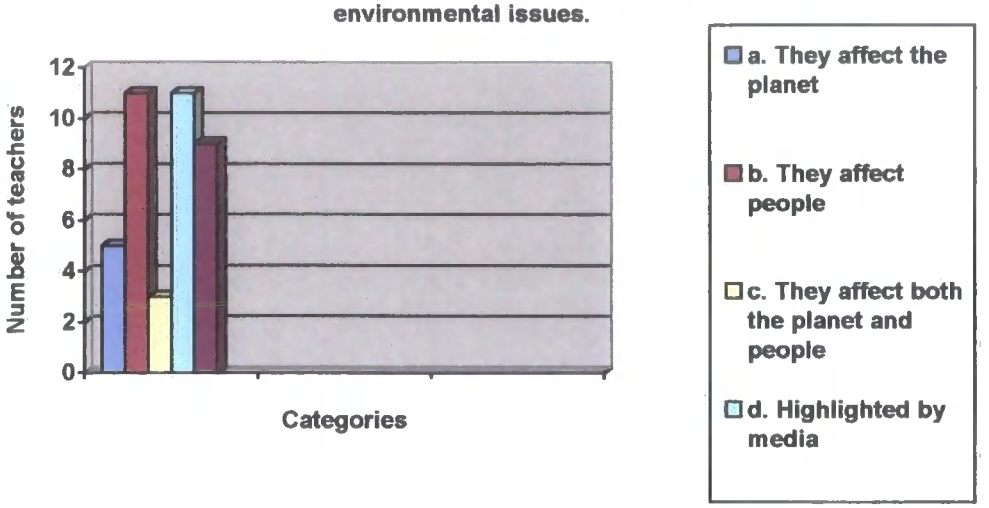
Eleven other teachers (28.2%) attributed the significance of such environmental issues to the attention they have attracted from the media. Teachers claimed that: "*Because they see it on the television an awful lot and they saw people talking about it...*" or "*Because...they were on the news...*" or "*...they're the ones that have been brought to our attention probably the most, through the media...More publicity...*" or "*On the news at the time...*" or "*Well, the ones that you hear about in the news...*" or "*...because they're on news.*" or "*Because they are on the news most often.*" or "*Just because I know more about them...they are more publicised.*".

Three teachers (7.7%) attributed the significance of such environmental issues to the consequences they could have both on the planet and on humans. They claimed that: "*...because that has great implications for low-lying countries...because...the plant life and animal life in the rainforest is second to none...they have great implications for the people concerned in terms of their life...*" or "*...because I think it affects everything...it goes in to everything like destruction of the rainforest, destroying our...things like the statue of Liberty...*" or "*Because eventually the world may be, you know, flooded or it may loose more land and the implications it has on people and various countries.*".

Finally, 9 teachers (23.1%) attributed the significance of such environmental issues to general matters like: "*...these are things that they don't necessarily affect us in this country on a day to day basis cause we're comfortable here but I don't think morally that we should ignore them.*" or "*...because human relationships are the most important thing in the world and if we can't care for one another, how can we be expected to care for the world we live in, I mean they go hand in hand.*" or "*Because it's something that you can do something quite easily about and I think it would make a big difference if people did do something about it.*" or "*Because it's the way we are, people do things for themselves...*".

All these reasons explaining teachers' ideas concerning the importance of environmental issues are schematised in Figure 17.

Figure 17. English teachers' ideas concerning the significance of environmental issues.



7.3.3 Where do you think your knowledge of environmental matters has come from?

Four teachers (9.3%) emphasised their personal interest, experiences and love for nature. Teachers mentioned such things as: "*Personal interest. I like geography...it's a personal interest.*" or "*...I've always been interested in the environment...geography and history were part of my studies...my personal interest...*" or "*...from my own study-reading, listening to documentaries, experience life...having a caring attitude myself towards life and valuing life...*" or "*Interest...my personal interest, I enjoy the countryside, so, it's just personal interest.*".

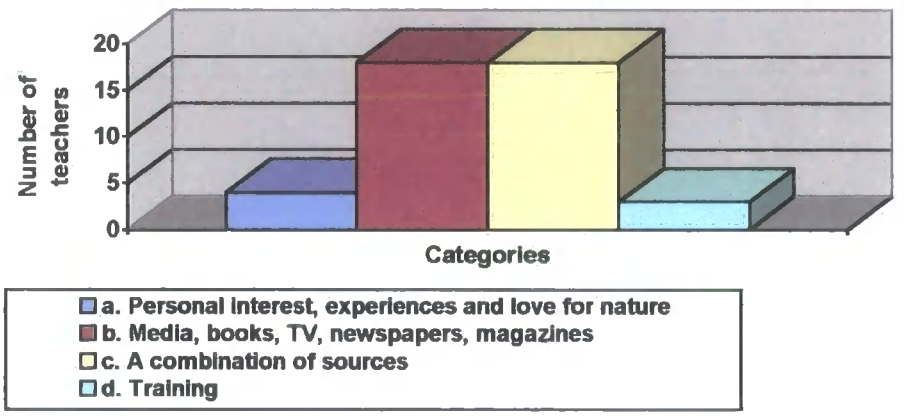
Eighteen teachers (41.9%) believed that they attained their knowledge of environmental matters from media, books, TV, newspapers and magazines. They claimed such things as: "*Reading newspapers, watching news on TV, discussing it with friends.*" or "*Reading newspaper articles...reading a magazine, other media sources like television news, television character programmes, things like that.*" or "*...Television, video, books, you get it from all over.*" or "*News, some general reading, discussion programmes, TV mainly.*" or "*The media, television, newspapers in particular...*" or "*Television I would think and videos...*".

Eighteen other teachers (41.9%) considered that they acquired their knowledge of environmental matters through a combination of sources. Teachers discussed such things as: "*...from television, magazines, some could have come when I was in university...during my initial teacher training...it was called environmental education but there was a lot of geography and few environmental issues.*" or "*Part of it when I was a student...growing up and listening to [it] on the news...*" or "*...I haven't particularly studied it but I do have an interest personally in nature...just informed reading or news reports...my father...was very much a gardener and we always had lots of animals around...*" or "*...probably some from teacher training...just generally from my own education...I will read something if it's there...I'm not looking for it but I'll read it if it's available...*" or "*My own schooling as a child and family...A mixture of both family and...the education I had at schools, very, very good.*".

Finally, three teachers (7%) considered that their knowledge of environmental matters came from their training. They said: "*...just really from the experience I had in Newcastle Architecture Workshop and from the course and bachelor of education that I did...just the more projects I've got involved in, the more I've learned...from the teachers...*".

Figure 18 displays the categories and the number of teachers belonging to each category.

Figure 18. Sources of environmental knowledge for English teachers.



7.3.4 There are formal sources and informal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing

facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

Eight teachers (18.6%) believed formal sources to be more important than informal sources. They claimed that: "*If you want to acquire it then you would actually go and use a book and look up specifically what you want or use some computer software which would be the most effective way of finding out...*" or "*For me personally it would be leaflets...books, television...especially I would think TV, yes.*" or "*News and media, television because it is immediate. If something dramatic happens, there is a flood or a volcanic eruption, you hear about it straight away...*" or "*I think what you read and what you possibly see on television...I don't often think people really have that big [an] influence on you...what I read and what I see would have the biggest impact for me.*".

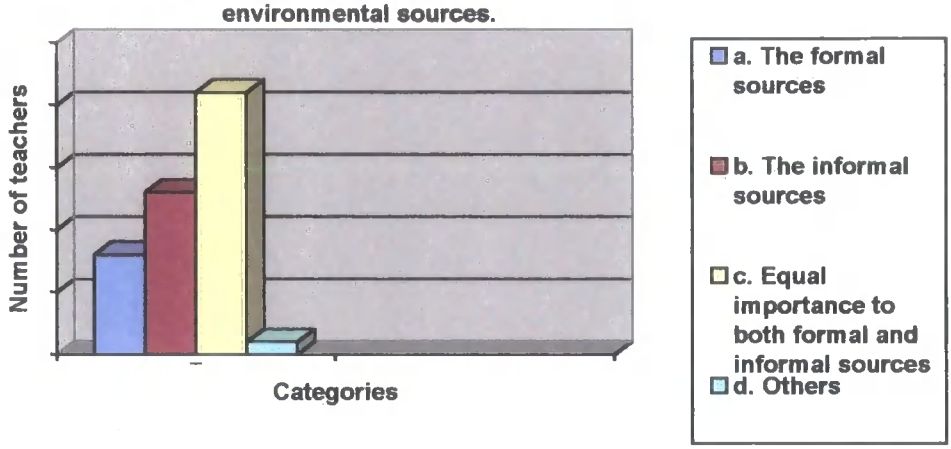
Thirteen teachers (30.2%) claimed that the most important sources of environmental knowledge are the informal sources. They mentioned things like: "*...it is perhaps more effective to talk and interact, react with people...in terms of creating an interest, discussions with knowledgeable people would be better...*" or "*...interacting with people in a community, because, I mean, environmental education is ostensibly community based...*" or "*...I think interacting with other people...because you can find out other people's views...you can only get one side of the story from the television, what they want to put forward...if you talk to other people, you get to know more than one point of view.*" or "*Going out and experiencing it yourself and listening to people telling you about what you're actually seeing.*".

Twenty-one teachers (48.8%) attributed equal importance to both formal and informal sources of environmental knowledge. Teachers claimed: "*Well, both really, because, you know, if none of you have any knowledge, interacting with them is just having the desire to do something...I think you do need the other sources as well.*" or "*...both cause you get some different perspective from speaking to people than you do from reading something...it's more one-sided information...but when you're discussing something it helps you to feel stronger about it...*" or "*...books give you the information but it's easily forgotten...each has their place in learning, it's a fifty-fifty split...both ways are important.*" or "*It's a bit of both...it depends on who you are, I think it's gonna affect different people in different ways.*".

Finally, 1 teacher (2.3%) discussed general matters, such as: "*...I think it depends on their level of interest as to whether...they'd have the personal motivation to find out information for themselves...*".

Figure 19 indicates that teachers attributed equal importance to both formal and informal sources.

Figure 19. English teachers' views concerning the importance of environmental sources.



7.3.5 Do you think we live in an environmentally literate society?

Six teachers (23.1%) believed that we live in an environmentally literate society. These teachers claimed that: "*...there's a lot of media attention when issues blow up, things like oil pollution at sea...like the fires in Malaysia...we're aware of some things and we don't do an awful a lot to act upon them...*" or "*Yes, I'd say it was fairly literate in most countries...*" or "*...our country it's quite literate and it's our job to educate the poor countries...the developing countries...*" or "*I probably thought we were quite literate...*" or "*...because of TV it's become much more...we are literate in environmental issues...we are aware of environmental issues...*" or "*I think in this area we do live in an environmentally literate society...*".

Seventeen teachers (39.5%) believed that we live in a society which is becoming environmentally literate. They claimed that: "*I think we're becoming increasingly environmentally literate...purely in terms of communication, we are becoming more environmentally literate...*" or "*We are now more aware...the last ten years...*" or "*I think we live in a growing literate society, I think people are becoming more aware of the issues...that's slightly different to whether people are actually doing anything about the issues.*" or "*I think we're getting more environmentally literate...we see it*

all the time and...it's more on the news, while at one stage you didn't know about what was going on everywhere in the world...I think we're getting to know more...even late '70s and early '80s we weren't very aware of what was going on...now...we're aware of CFC's...".

Twenty teachers (76.9%) claimed that we live in a society that is not environmentally literate. They mentioned such things as: "*...I'm not sure that people are very environmentally literate...people aren't really that bothered...they tend to see it as something that the trendy people are interested in...*" or "*No, we don't...I think some countries are more environmentally aware than we are...that is America...they're much more aware of the environment...they've got more industry and so they've got...more problems...*" or "*I don't think we are very environmentally aware, I think everybody does little bits in pockets...*" or "*No it's not. No, it's awful and I think countries...don't take responsibility.*" or "*I don't think we are literate in that respect because people are too selfish, they don't think of the big issues...*".

Figure 20 depicts these findings.

Figure 20. English teachers' ideas concerning the environmental literacy of today's society.

7.3.6 What about differences between developed and developing countries?

Twenty-five teachers (58.1%) believed that the developed countries are more literate than the developing ones. Teachers claimed such things as: "*Yes, there are great differences...due to the advanced state of developed countries which puts the issue environment high on the agenda...developing countries have other priorities such as survival, freedom of speech, so environment is a low priority.*" or "*More developed countries are more interested because they've got the money to do it...*" or "*Developed countries are more environmentally literate because they can afford to be. In America people are more environmentally aware, they have more industry.*"

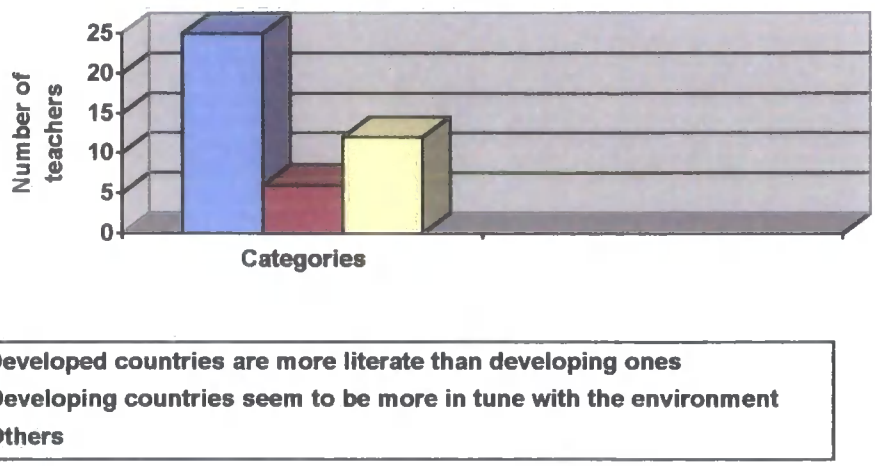
or "*Developed countries are more environmentally literate due to TV, newspapers, media.*".

Six teachers (14%) believed that the developing countries seem to be more in tune with the environment than the developing ones. One of these teachers believed also, that developed countries could be more literate than the developing ones. He actually said: "...*in the developed countries we're certainly more literate than the underdeveloped countries but...many people in underdeveloped countries live ...in their old ways...they haven't got cars...agricultural machinery, they don't use pesticides or fertilisers, they use the old methods, so therefore they maybe promote the environment*...". The rest of the teachers claimed that: "...*I think we're worst because we've got the capability to be worst so...I think we're probably more at fault*..." or "...*people in underdeveloped countries are brought up on the land and they get a great feeling of how it works...we get to know the land through...education...far more people...live in town and cities*..." or "*Developing countries haven't done anything to make air/sea pollution, but yet they are been told to do the same, to pay the same price [as] the developed countries.*".

Twelve other teachers (27.9%) discussed general matters. Teachers said that: "*It's relative to the country we're talking about. We recognise in developed countries that the increase of chemicals are detrimental to health. Developing countries don't have the capital to do so...However DDT for instance is prohibited in [the] UK but they still use it in some African countries because they cannot afford anything else. So, it's relative.*" or "*I don't know, I don't have any opinion on that.*", or "...*I think people are becoming more aware generally.*" or "...*countries are more involved with each other because of the communication ability, then it is possible that everybody is at the same stage but I don't know.*".

Figure 21 indicates the high numbers of teachers who attributed environmental literacy to developed countries.

Figure 21. English teachers' views concerning differences between developed and developing countries.



7.3.7 How do you see the school's role in creating future environmentally literate societies?

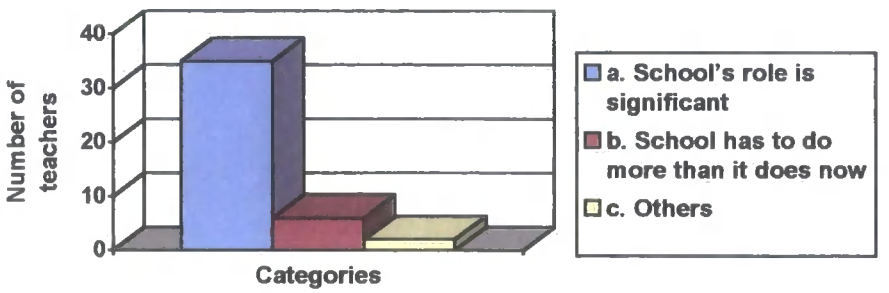
Thirty-five teachers (81.4%) claimed that the school's role is significant, without making any particular suggestions for changes. Figure 22 presents the number of teachers for the different categories. Teachers mentioned things like: "*The school's role is to provide accurate information which is as accurate as possible, so the children can start to make informed choices for themselves.*" or "*...it's very important...I think the parent's role is more important than the school's role...*" or "*Discussing and bringing these points to the children, making them aware that these issues do matter...*" or "*The school's role is getting the children to show an interest in the environment...school's role is very important...it depends if you got a teacher who is prepared to give up their time to do that because it's their own time...*" or "*Through using the local area and the different localities that we study, all we can do is suggest, encourage, promote environmental ideas that will help the environment and hope that the children will take these ideas on board.*".

Six teachers (14%) claimed that school has to do more than it does now. They said that: "*...more money [needs to be] spent on training and better ways of educating the children...continue their education.*" or "*...we're probably going to have to make sure that we look at it more closely and cover it more closely...children perhaps don't have the right entitlement...*" or "*...it needs to start from [a] very young age even reception...have it as part of the timetable or somewhere where it*

could be fitted in with a subject..." or "*...I think a lot of the knowledge that the children grow up with, is very disjointed and it just depends on the teacher...but it's not seen as a priority within the National Curriculum...*".

Finally, 2 teachers (4.7%) discussed generally the school's role. They claimed: "*To teach the children that if we don't take care of it, who will?...I think that outside influences are stronger than school's...I think that society is at odds with schools...I don't think we have the backing and I think that governments are not prepared to take responsibility.*".

Figure 22. English teachers' ideas concerning school's role.



According to the teachers, schools should continue to educate pupils on the importance of the environment. A small percentage of teachers (14%) suggested that schools need to do more than they do now, if we want to have environmentally literate societies in the future. The vast majority of teachers (81.4%) accepted school the way it is, without making any particular suggestions as to what should change or not.

8. FINDINGS OF THE GREEK TEACHERS' INTERVIEWS.

8.1 Greek teachers' awareness of environmental education.

Six questions attempted to investigate teachers' awareness of environmental education. Some of the questions are comprised of two parts. These parts will be presented separately. This serves better the presentation of the findings. Thus, the questions investigating teachers' awareness of environmental education asked:

1. What do you think environmental education is and what should its aims be?
2. How long do you think it has existed as part of the school curriculum?
3. Do you know any important publications, conferences or other initiatives that have determined the character of environmental education?
4. Are there any particular student ages that environmental education should be focused on?
5. What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?
6. What do you think are the best ways of incorporating environmental education in the school curriculum? For example, should it be a separate subject or part of a general topic and why?
7. What are the most important aspects of environmental education that young children should be learn?
8. How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

8.1.1 What do you think environmental education is and what should its aims be?

Four teachers (9.5%) focused their discussion on the local environment. They mentioned such things as: "*...is for children to realise...the area which surrounds us...Environment is the school field, is the school yard, is the street...trees...mountains...people...the village forest...Its aim [is to]...protect the environment where they live and...realise its value.*" or "*...we mean that children should learn where we are, what is around us and how this place around us affects our lives...that can be our school, our family, our sea...the mountain, the forest...to learn that nature around us affects life in a direct way and we have to protect nature in every way...*" or "*...It is the knowledge of the environment...we mean everything that surrounds us, inanimate and animate, including ourselves, ...Humans have a*

direct relationship with the environment...and he owes firstly to meet the environment in which he exists..." and "*...whatever relates to the environment...that which exists around us where we live, where we breath, where we work, where we swim...to save the environment as much as possible...*".

Twenty-three teachers (54.8%) talked about the environment in general. Teachers mentioned that: "*...we give such knowledge to pupils, to get to know the environment and we should give them ways of protecting it...environment is whatever surrounds us, nature, trees, animals, plants, lakes, rivers, mountains, everything...the aims...to protect the environment as much as possible...*" or "*...has to do generally with issues that are related to the environment...whatever that's related with nature, with our life, with the amelioration of our life, with the pollution of the environment...to make children sensitive towards the environment...*" or "*It's...informing society, children and the world about issues that are related to the environment...everything around us, the nature that surrounds us...informing the citizens...on issues that are concerned not only with the environment's protection...our place in the environment, our obligations and duties...*" or "*Children should be taught what environment means and what the environment offers to man...Everything that surrounds us, earth, air, sea...It's about keeping this environment clean, pure, as much as possible...*".

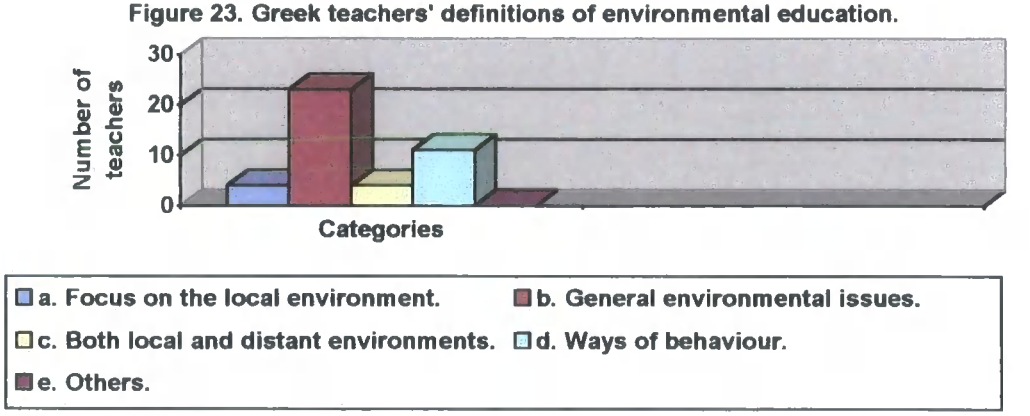
Four teachers (9.5%) discussed in their definition of environmental education a combination of both local and distant environments. More particularly, they said: "*Everything that surrounds them, our tradition...bio-communities, our city, our place, from the smallest surrounding place of school to the environment of the whole planet...we talk about the small social environment of school and then it extends to the social, political and cultural environment of a city, of a country, of our country and generally of our planet.*" or "*...has to do with everything that's related to the environment...where we live...and generally the whole nature...with the amelioration of life in the environment...we have to take care of and protect the forests. And many other places like bio-communities.*" or "*How a child can learn...protect the environment around him...Everything, from the simpler things such as the place that surrounds us to the wider environment...I mean the green of the city, the rubbish of the city, the pollution of the city and generally then in the world...To make children responsible and aware of what they should take care of...*" or "*It is the kind of education which generally deals with the environment...we*

try to make it more general about the environment, for the environment, in the environment...Everything that surrounds us, not only the natural environment...Even the school yard, our neighbourhood, our park, all these things are within the frame of environmental education...To make children sensitive...to whatever is really around them.".

Finally, 11 teachers (26.2%) emphasised in their definition of environmental education ways of behaviour towards the environment. They claimed: "*...ways of protection...educating young people so as to understand that environment and people must co-exist...environmental education should become a way of living.*" or "*To sensitise children and to teach children about the environment and whatever is related to that...to have some opinions...about the environment, to be sensitised so as to be part of movements or organisations...so as to make good use of the knowledge we are going to give.*" or "*Children should learn to respect the environment...protection of the environment.*" or "*I think it's to make all people, pupils and...teachers, sensitive on nature issues, on the balance of nature and on the better management of nature...to make pupils sensitive...so as to know how to manage nature.*" or "*...environmental education...puts certain frames as to how children should behave towards the environment...how they can act...the way they behave...to help every person to be activated on the environment's protection...Active behaviour...*".

Figure 23 shows teachers' replies as to what constituted environmental education. It is clear that most teachers based their definition on the teaching and learning of general environmental issues.

Figure 23. Greek teachers' definitions of environmental education.



8.1.2 How long do you think environmental education has existed in the school curriculum?

Replies were varied. Some teachers mentioned that environmental education did not constitute part of the school curriculum. Others mentioned that it has been implemented for some years now. Figure 24 describes the categories which emerged from this question and the number of teachers belonging to each category. Seven teachers claimed that environmental education did not exist in the school curriculum. They said: "*I don't think that environmental education is taught in primary school...I think that it is up to every teacher how much he/she will inform pupils on such issues...I'm not aware whether it has been implemented in primary school.*" or "*I don't know. As far as I know, I think that it doesn't exist in the school curriculum...from what I have seen at the schools that I have worked...there isn't any care, it's something optional...*" or "*From what I know, it doesn't constitute part of the school curriculum...they send us some documents which have to do with some instructions but officially, as a subject, it hasn't been established...These instructions are concerned with the destruction of the environment, with the protection of the environment, with tree-planting activities...*" or "*In essence, it's not part of the school curriculum, whoever does environmental education, does outside of the school curriculum. There may be an Office for Environmental Education, but...school curriculum is the curriculum that teachers have to practice, not whatever is optional...*".

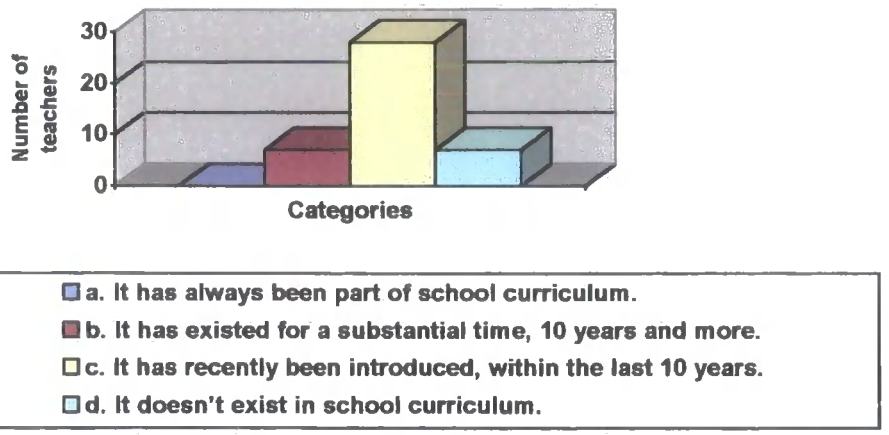
Twenty-eight teachers (66.7%) believed that environmental education was a recent introduction into the school curriculum, that is within the last 10 years. They claimed: "*...it must have been the last 6 or 7 years...In the school curriculum there's no teaching hour for environmental education...Whatever is happening, it is extra to the teaching schedule or...it's done through the subject 'Study of the Environment'...there is a consultant for environmental education and she visits schools...*" or "*...the last 10 years we have started in schools seeing the environment in a different way...with the new books that were introduced...It's the [subject] 'Study of the Environment'...which starts from the direct environment and reaches the distant one...Before that, lower classes had no book and higher classes had geography.*" or "*It never constituted part of the school curriculum. The last year there were...some directions given by the Ministry...that you can do environmental education in some of your teaching hours...They [teachers] have only some*

consultative help from the Office of Environmental Education... Only from January 1998, did it [the Ministry] give teachers the possibility to add 1 or 2 hours to the school schedule... These hours will be rewarded as extra hours and teachers can practice environmental education." or "*It hasn't been there for long. It's been there for some years...four or five approximately... It's demonstrated with some programmes that take place in schools... These programmes come from the Ministry of Education.*".

Seven teachers (16.7%) said that environmental education has been part of the school curriculum for a substantial time, 10 years and more. In particular, they claimed: "*Since 1982, when the new books for primary education were written, the term 'environment' appears more frequently. Previously there weren't many references... Maybe that's due to recent years... because the environment has been polluted a lot...*" or "*Certainly 20 years, as many years as I have taught at least... It is present in the school curriculum through the subject 'We and the world' [the same as the subject 'Study of the Environment]...*" or "*Well, environmental education on its own, doesn't exist. But through extracts and units, in combination with other things... the Language subject, the subject entitled 'We and the World', even history... There have been since... '82 or '83 when those books came in. Teachers on their own can elaborate on such environmental issues.*" or "*It's not exactly part of the school curriculum... environmental education is not a subject like maths, history, chemistry... We have the 'Study of the Environment' and this subject includes many things... we get many stimuli to discuss all sort of issues concerning the saving of the environment. At least 15 years.*".

Finally, none of the Greek teachers claimed that environmental education has always been part of school curriculum.

Figure 24. Environmental education in Greek school curriculum.



8.1.3 Do you know any important publications, conferences or other initiatives that have determined environmental education's character?

Nine teachers (21.4%) referred to organisations. They mentioned: "*...There's Greenpeace, various environmental agencies...*" or "*...Greenpeace, WWF, that's all...We are members of Greenpeace...they send to our homes informative leaflets...about forests...endangered species, about factories...*" or "*...I know Greenpeace is a big organisation...and whatever comes to my attention daily from TV...*" or "*In Greece I know the Interdisciplinary Institute for Environmental Research...has been in existence for the last 2 years and I participated in a seminar that it organised this summer.*" or "*I know that there are many organisations but I cannot name them...all the WWF messages on TV or whatever we see on the news that Greenpeace is doing all over the world...*" or "*...Greenpeace is the one we hear about most often with all the actions that it takes, concerning waste, toxic and nuclear waste that is being thrown in to the oceans...*". Apart from Greenpeace and WWF, Greek teachers identified some other national organisations such as Arktouros as being responsible for planning environmental education programmes. One such popular programme devised by Arktouros was about the brown bear.

Only 1 teacher (2.3%) mentioned a publication. She said: "*...I have some books...I have a series which I don't remember its name, it's not Greek...they make general references to environmental issues like destruction from nuclear factories, toxic rain, it's a series of books and the author is not Greek...simply gives you the information.*". That publication provided the teacher with information on general environmental issues.

Two teachers (4.7%) talked about conferences. They said: "*...last year, there was a three day conference for environmental education...here in Greece. It was a conference organised by the Greek Gold Company where university teachers from Thessaloniki participated with very concrete issues...it dealt with all the issues that had to do with our country...it started with sea pollution...air pollution, the consequences that we experience after Chernobyl...It was mostly about the natural environment and not as much about the social and cultural one...*" or "*...there were two important conferences, one in Rio de Janeiro and the other in Delhi, if I'm not mistaken...for Rio de Janeiro conference, I'm aware of the Agenda that was...published and has been introduced by many countries that participated in the conference...It was about ways of action. Ways of action aimed at the improvement of the environment.*".

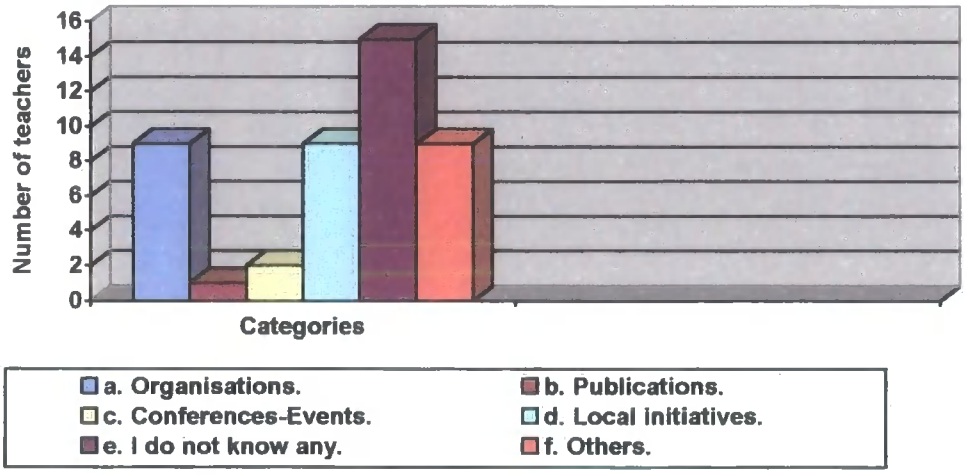
Nine teachers (21.4%) talked about local initiatives. They said: "*...for the last 8 to 10 years, there has been both in primary and secondary education, a person responsible for environmental education.*" or "*...There are initiatives in our county. There is someone responsible for environmental education both in primary and secondary education...*" or "*...the club of ecologists in Drama...they are willing to help by giving posters, information, whatever.*" or "*...when the Office for Environmental Education of our county organise seminars, then they present principles of environmental education.*" or "*I know that there are some clubs...on a local level, which are very active...These clubs can be responsible for the protection of forests, for the protection of the environment generally...they visit schools where they trust one or two teachers...to work more diligently in this area...*" or "*I know that there is an Office responsible for environmental education for both primary and secondary schools, these offices have been active now...*".

Fifteen teachers (35.7%) claimed that they were not aware of anything. They said: "*Over the last few years there have been many conferences and various documents that deal with such issues...No, I can't tell you anything at this particular moment.*" or "*No, I don't know any.*" or "*No, I don't know anything.*" or "*...I have never studied environmental education closely, because...4 years ago that it started to become more widely known, was exactly the period that I had a baby.*" or "*...I haven't dealt with that, I haven't heard...*" or "*No, I cannot mention anything.*" or "*I don't know any, I have heard of initiatives on a local and national level but I'm not in a position to name them.*".

Finally, 9 teachers (21.4%) mentioned general matters, such as: "*...there are seminars that have happened through the initiative of the primary education adviser and of the local county.*" or "*There are certain things. Last year I attended, here, in Kavala a two-day in-service training seminar which was very nice.*" or "*In-service training programmes, daily meetings...*" or "*...I don't have any particular information...I know some general things...efforts concerning the protection of certain species like caretta-caretta which is in Kefalonia...*" or "*On a local level...there were some in-service training programmes for environmental education.*".

Figure 25 indicates teachers' replies regarding their knowledge about environmental education.

Figure 25. Greek teachers' knowledge about environmental education.



These results indicate that teachers were aware of organisations, of publications, of local initiatives and of conferences, but not to any great extent, and the kind of things they were aware of can hardly be said to have shaped the character of environmental education. Teachers talked about either NGOs, which promoted a certain agenda on environmental issues such as Greenpeace or about organisations that could help schools plan environmental education activities such as the local Offices for Environmental Education and national organisations.

8.1.4 Are there any particular student ages that environmental education should be focused on?

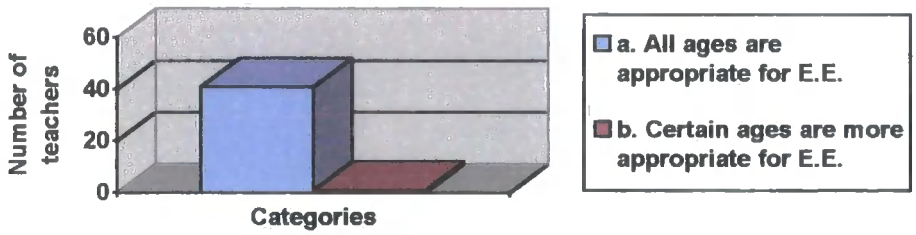
Forty-one teachers (97.6%) suggested that all ages were appropriate for environmental education. They said such things as: "*...I believe that environmental*

education should be addressed to all people...it should start from a very young age." or "*...I think that children from their kindergarten age...can do it because it is close to their nature...*" or "*...I believe that from the moment a child comes to school, there should be such environmental thinking and searching, of course on a different level for each age...From an early age, from kindergarten school.*" or "*To all ages...from the first grade, we have to start sensitising children. Depending on their age, we will say to them the appropriate things...*" or "*This kind of education should start from the moment that a person is born till the moment he/she will close their eyes...from the moment they come in to school till the moment they will leave.* ".

Only 1 teacher (2.4%) said that certain ages were more appropriate for environmental education. He claimed: "*...it should be addressed in all school grades, but...it should focus on some grades that are higher than the third grade, when children can understand...something more concrete.*".

Figure 26 shows the categories emanating from this question and the number of teachers in each category.

Figure 26. Environmental education and pupils' age for Greek teachers.



The majority of Greek teachers (97.6%), as with the majority of English teachers (90.7%), perceived environmental education as a process which should start early in life. All ages were deemed to be appropriate for environmental education regardless of the class the children were in.

8.1.5 What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

Thirteen teachers (30.9%) believed that the content of environmental education should focus on the immediate environment. They claimed: "*...it should focus on local issues...the problems of the country...the bio-communities, the living*

conditions that exist in the city, where they live, how we can ameliorate these conditions, how we can intervene in the environment of our home, of our school, of our city, of our country...it is necessary to be aware of local history...to plant trees...flowers...How we can create our own gardens on the balconies." or "*Issues that have to do with the immediate environment, that is, the area of the school, their classroom, their school neighbourhood...the nearest forest...the nearest park and work on the animals, on the birds...it has to be something that's very close to them...How we can intervene in order to make our life in school better...*" or "*...to get to know their region, to see negative things that are around them and examine ways to correct such negative things that may exist in our area...a field where there is rubbish...know the green area that surrounds us...planting trees...*" or "*...they should be taught the direct effect that the environment has on our lives, to appreciate that nothing is accidental and that the consequences of some actions...could be indirect and decisive for our lives...Starting from our school surroundings, the neighbourhood, the village...particular problems that certain places may face...it should start from the environment around us, we should mention the problems the area faces, try to trace the causes of these problems and seek solutions...*" or "*...the environment where they live...to respect that place keeping it clean....about the sea, all children go to the sea...they can distinguish between dirtiness and cleanness...Air pollution which is all around them, they live in it...*".

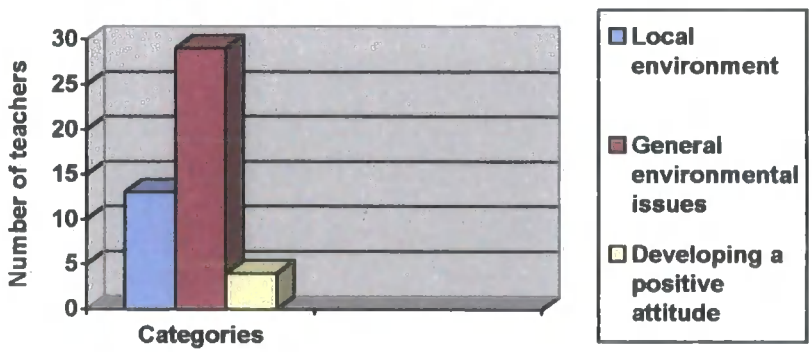
Twenty-nine teachers (69%) considered that the content of environmental education in the primary school curriculum should include the teaching of general environmental issues. Teachers claimed: "*...it could be how forests can be protected, how tree-planting activities take place in destroyed forests, if we find ourselves on a dirty beach, how we can clean it...cleaning issues...*" or "*....it should entail issues that are generally associated with the environment's pollution, but also other issues such as the stock-breeding in our region....the nutrition...Whatever issues that are associated with animals, with plants, with transportation means ...the animals of our country...flora and fauna... the history of our region...about methods of transportation...*" or "*...we mostly think of environment protection...it could be the picking up of litter...the recycling issue...issues that concern citizens of a city...The recycling of rubbish...*" or "*...take them out into nature...In places that either have been destroyed or which present an intense problem...a burnt forest, even on the beach where a city waste may end up.*" or "*...with a very young*

child...about the significance of planting a tree , not to destroy things when we go on excursions to parks, there's no need to run over flowers...simple things. To love animals...in the higher primary school grades, you can say something more...about the factories that pollute seas, about car gases...that there's no need to take the car for a distance that's within the block, you can walk, you can use bicycles.".

Finally, 4 teachers (9.5%) talked about the significance of developing a positive attitude towards the environment. They mentioned such things as: "*...issues like how we can save the forest, how we can save our region, how the street can be kept clean, how our neighbourhood can be cleaned, how we can pick the rubbish instead of throwing it around, plastic bags, papers, whatever.*" or "*Simple things...everything that concerns their life, the quality of their life, that is the cleaning of the place they live in, the love for greenery, the love for the sea, the love for clean water, the love for animals, to live with simplicity...we could very easily use our car less in a small city like Kavala.*" or "*Issues concerning the protection of flora and fauna, children should realise that life on this planet is a right for all organisms, issues concerning sea protection and air protection.*" or "*The essence is to get into a child's mind, heart and soul and show why he should love nature...I say to all...that as man distances himself from nature, he becomes insensitive...show to children how close man should be with nature and how much more humane and sensitive a man can be when he is close to nature...*".

Figure 27, shows what teachers considered to be the content of the environmental education curriculum in terms of teaching general environmental issues, the local environment and of developing a positive attitude towards the environment.

Figure 27. Greek teachers' views on the content of environmental school curriculum.



8.1.6 What do you think is the best way of incorporating environmental education into the school curriculum?

Fifteen teachers (35.7%) suggested that it should be a subject in its own right. They said: "*I would say that both teachers and children are mature enough to have environmental education as a separate subject because I consider it very important, the environment should be presented in a correct and scientific way and not with references through other subjects.*" or "*...first of all there should be people specialising in that...the specialist can bring much better results than someone who does not have that expertise...because that teacher would have constant contact with children while the programme lasts only one or two days...*" or "*...I'd prefer it to be a separate subject so that teachers have the stimulus to work more on it, that is one hour or even better two hours per week.*" or "*...it would be better if it was a separate subject...one hour weekly or even one hour every two weeks as a separate subject.*" or "*Definitely it should be a separate subject...Because the environment concerns everyone and we should pay great attention to the environment because we are heading from bad to worst...it should be a separate subject...*" or "*Separate subjects...so there can be hours for it to be worked on...For instance, two hours weekly...*" or "*...it should be a separate subject where we can refer to some issues....we should have a book, some instructions...*".

Fifteen teachers (35.7%) thought that environmental education would be better implemented in the school curriculum through separate subjects. They claimed such things as: "*...it should be part of the lesson. But there should be more time for elaborating on such environmental issues...it can pass really smoothly to children...*" or "*...it is better...when you teach physics...you can talk about the environment, about the hole in the ozone layer...about car fumes that pollute the atmosphere...they can digest it better rather than studying it as a theoretical subject...*" or "*When learning happens with reference to issues that have already been taught, then the stimulus becomes more evident to children...in this way everything consists of a chain of knowledge which can sensitise everyone easier.*" or "*...I don't think that it should be a separate subject...I believe that it can function better when it is implemented in the frame of the things we teach....*" or "*...I wouldn't like environmental education to be a separate subject because in this way...we stereotype things...when the motivation is given through the subjects...then children function more freely and more spontaneously, they express themselves in a*

more direct way, it comes out easier... in all subjects you can find stimuli..." or "*...I think that daily in our subjects we have opportunities to refer to nature...you can...daily...give them the motivation to think...*".

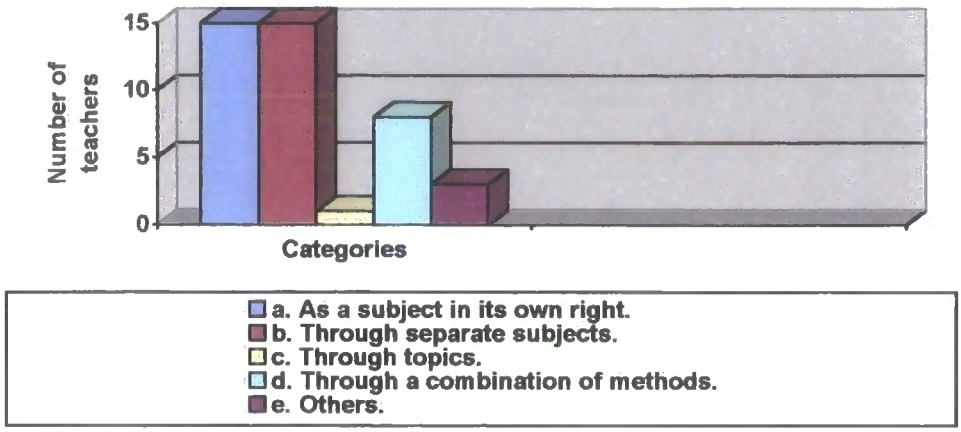
One teacher (2.4%) said that environmental education could be implemented through topics. He actually said: "*...I wouldn't say that it should be a separate subject, but teachers should be given some time weekly...teachers should prepare every time a topic to analyse in class, with transparencies, with pictures, with as much additional materials as possible...if it's a subject with a certain format, it won't cover the needs of every place, because every place has its own particularities...*".

Eight teachers (19%) suggested a combination of methods. They said things such as: "*Well, as a separate subject clearly...so as to have more opportunities to present to children more things about the environment. But we shouldn't forget the other subjects, in all subjects we can say something about the environment...it helps even more...*" or "*...environmental education should be happening in all subjects and whenever we have stimuli in class...But I also believe that there should be a separate teaching hour for those teachers who undertake an environmental education topic...it could be taught as a separate subject as well, so as to deal with it more...*" or "*We can implement environmental education in many subjects...However...I believe that there should be one hour ...for environmental education...*" or "*On the one hand it is good to have it as part of a general topic because through other subjects and through references, many things can be passed on to the students. However...if there is a particular subject...then the teacher will be able to give a certain curriculum...*" or "*Both....as a general topic but as a special subject as well, along with some practice, some action...*".

Finally 3 teachers (7.1%) mentioned general matters such as: "*I think that it would be more successful if the children, through a programme...were getting involved in activities relative to the environment...it is no good having it as a subject where children will have to learn something...I think as part of a programme.*" or "*...I don't know if it could be a separate subject, because there are no teachers that have the preparedness...I would accept it as an activity which would stimulate children's interest because they would participate...*" or "*...we cannot see it as a subject...there should be such programmes that students will be able to visit a place...there should be...provision for some more hours dedicated to these issues.*".

Figure 28 describes teachers' views regarding the incorporation of environmental education into the school curriculum.

Figure 28. Greek teachers' views concerning the incorporation of environmental education in school curriculum.



8.1.7 What are the most important aspects of environmental education that children should learn?

Four teachers (9.5%) mentioned by name the local environment. They said: "*...the local history, the problems of the city, of the village, the bio-communities that exist around...their cultural heritage...to become aware of their environment generally, of their social, of their cultural, of their archaeological, of their historical environment. To see it from all angles.*" or "*...starting from the area, the neighbourhood, the village, etc., a knowledge from the direct environment of the village and then in higher classes we can enrich these issues with some theory.*" or "*...all issues concerning the environment should be taught to the children...from their direct environment so that they are able to understand them...from their city, from their village, from their country...*" or "*...the surrounding environment of a pupil...their immediate environment and...the problems that exist in our area, that is, the problems that there are on the surface of the earth and of the air, about the pollution caused by factories and by cars...*".

Nine teachers (21.4%) considered the most important aspect of environmental education to be the inculcation of values and respect towards the environment. They discussed such things as: "*The relationship of humans with the environment...today mankind is so much convinced that it is separate...species...the connection between man and environment has been put aside without people even suspecting it...Do you know what children consider as environment? The mountain.*" or "*...protection of*

the environment... Today the environment has been hurt that much, that we don't even have the luxury to meet it... it is very important to have movements for the environment's protection... to create dynamic citizens." or "*Protection of the environment, respect towards people and towards the environment... There should be an effort made to change the attitudes, particularly those of adults... through children.*" or "*To love the environment, to take care of the environment... and generally to be sensitive to whatever is around them... It should become part of their lives.*".

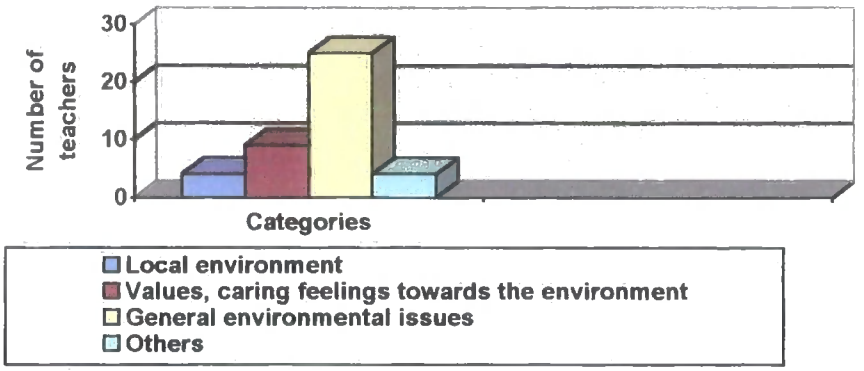
Twenty-five teachers (59.5%) considered that the most important aspect of environmental education was the teaching of general environmental issues. They mentioned such things as: "*...I believe that starting from small things such as not throwing papers down on the floor or out in the environment...*" or "*The most important issue... concerns the problems that are caused by nuclear energy... Other issues after that... the pollution from industries when... they don't put the appropriate filters...*" or "*...we should try to safeguard animals' and birds' life, we can take them on an excursion... to see the various bio-communities, forests and all these things...*" or "*...pollution... If you go out in a school yard, you'll see it full of rubbish... We may talk about it, but it needs to become action... yes, pollution, I want them to understand how cars, factories, etc, cause pollution and most of all how we pollute.*" or "*...protection of forests, especially now that we can see... rain and floods... the pollution of the atmosphere which comes from car emissions... factories... cars.*".

Finally, 4 teachers (9.5%) discussed general matters such as: "*I cannot say that something is more important than something else, everything is important, everything is in a chain... I think everything is as important.*" or "*...whatever we mention, it is going to be good because there are so many things that surround us and affect our environment badly...*" or "*...everything is important, there's nothing in particular...*" or "*Since school consists of a group of people and since our aim is to create responsible people we need to start with the communication with other people and from that point onwards with nature... Communication with other humans and then communication with nature.*".

Figure 29 indicates that teachers considered as the most important aspect of environmental education the teaching of general environmental issues. The

inculcation of positive values came second and teaching about the local environment came third.

Figure 29. Greek teachers' ideas concerning the most important aspects of environmental education.



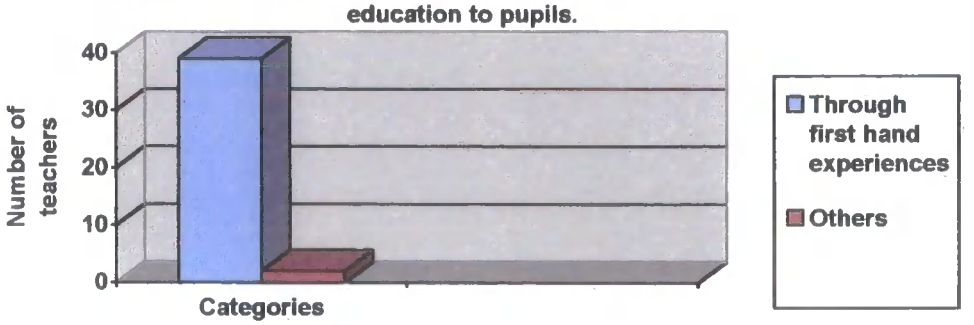
8.1.8 How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

Forty teachers (95.2%) claimed that first-hand experiences can instigate pupils' interest and consequently help their learning. They said: "*With a lot audio-visual material and working in the environment itself...*" or "*...it would be good if children could become members of some organisations, local organisations, so as to be able to communicate easily among schools...to use slides, photographs...many audio-visual means...with visits...*" or "*...by visiting places where there is a problem such as an industry that pollutes the environment or an industry that doesn't pollute the environment...Generally by visiting places in order to get either positive or negative pictures of the environment.*" or "*With slides, with magazines, with newspapers, with documentaries we can suggest from TV.*" or "*...with...visits to places where there is a problem, seeing the problem itself...audio-visual means, slides, films, video, etc.*".

Only 2 teachers (7.1%) mentioned general things such as: "*They should be divided into teams and work for themselves on that...*" or "*We should tell the truth...needs a particular plan...through the teaching units...a lecture-centred teaching...*".

Figure 30 clearly shows teachers' ideas regarding ways of presenting environmental knowledge to pupils.

Figure 30. Greek teachers' ideas on presenting environmental education to pupils.



8.2 Greek teachers' motivation to teach environmental education.

Six questions attempted to investigate teachers' motivation to teach environmental education. Some of the questions are comprised of two parts. These parts will be presented separately because the account of the findings is better displayed.

1. Do you teach environmental education?
2. Do you feel you need more environmental information or teaching guidance on environmental issues?
3. When was the last time you carried out an environmental project or you made reference to environmental issues in your teaching?
4. Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?
5. Have you ever used your school's surroundings in order to teach environmental education?
6. Are you engaged in any activities or organisations that will enable you to understand environmental education and plan any environmental activities?
7. Have you attended and pre- and in-service training courses for environmental education?

8.2.1 Do you teach environmental education?

Thirty-one teachers (73.8%) claimed that they did teach environmental education. They said: "*...there isn't a special subject in sixth grade. But in physics, there are quite a few units where there's direct and indirect reference to the environment. There are special units that talk, mostly, about environmental pollution, sea pollution, lake pollution, land pollution...and generally we are*

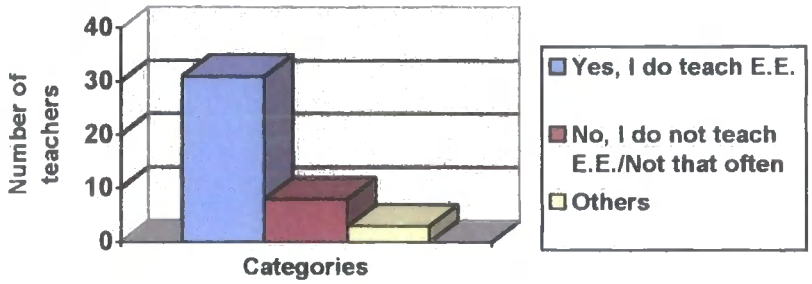
referred to more specialised issues, such as car gases, cities' smog, etc..." or "*Yes, I do...when my lesson allows me to go out, I go out. We make our observations and then we come back to the classroom and we discuss what we saw...through the subject 'We and the World'.*" or "*Generally, whenever I have the chance, I touch upon such issues...Mostly the subject 'Study of the Environment', but other subjects as well can provide stimuli.*" or "*...I often make environmental references in my teaching through the other subjects I teach.*" or "*Not as a programme, but with general or particular references when a lesson allows us, then I try.*" or "*...we always make references, every day we make references, taking stimuli from whatever subject...I find stimuli from the environment, from a dirty child...*" or "*Through the subject...'We and the World' we often make a references to environmental education...through all sorts of different topics that we have to teach from the aforementioned subject, we often make environmental references.*".

Eight teachers (19%) said that either they did not teach environmental education or they did not do it that often. They said: "*A little bit, through the 'Study of the Environment' or through physics.*" or "*No, because it isn't in the school curriculum as a subject...we make references if we have the opportunity, for instance yesterday it was the International Day of Animal Protection...*" or "*In a totally spontaneous way, nothing...properly organised like undertaking a project...*" or "*The school curriculum doesn't include environmental education in an obvious way. When we have stimuli from a subject, we will always make reference and we will discuss it in the classroom...there isn't a continuous effort, there is that fragmented thing which when teachers can offer it, they do so.*" or "*No, I haven't taught it so far.*".

Finally, 3 teachers (7.1%) discussed general matters such as: "*For four years I've been employed in the Local Educational Centre for teachers, I wasn't working as a teacher...*" or "*I have taught for six months...two hours...at the first grade of high school...it was for six months but we had 2 hours per week...usually, we do that in order to complete our timetable but it has to come from the teachers' interest...*", or "*I will teach it this year...this is the first time...*".

Figure 31, describes the categories that emerged from this question and it presents the number of teachers that belonged in each category.

Figure 31. Greek teachers' practices of environmental education.



8.2.2 Do you feel you need more environmental information or teaching guidance on environmental issues?

Thirteen teachers (31%) suggested that they needed mostly information. They said: "*Mostly...knowledge...because no-one informed us on a systematic basis...teachers can find ways of teaching for all issues.*" or "*Mostly knowledge...because there are so many issues...you need to have the particular knowledge...teaching guidance, due to our experience, doesn't give us hard time...if you have knowledge, you can easily go through.*" or "*Mostly information...We need to be informed, to know some things and from that point onwards, we will be able to pass them.*" or "*I can say with certainty that we lack knowledge as far as environmental education is concerned...all teachers, since they know how to teach all other subjects, they won't have problems to teach environmental education as long as they have the necessary knowledge.*".

Nine teachers (21.4%) claimed that they mostly needed teaching guidance on environmental issues. They discussed: "*The thing that we need, the thing that we are thirsty for and it shows in meetings and in seminars...is ways of teaching...methods for environmental education...*" or "*...I don't feel that I don't have knowledge on environmental issues, because I read newspapers...But I want ideas about the way I will teach these issues...yes, ways of teaching. I want ideas...I want particular activities...*" or "*...teaching guidance because...we don't teach only with theory but also with our example...how we present to the children, what ethos we give towards this direction, how we behave towards the children.*" or "*The person who will train us should know about children...on the ways we can present that knowledge,*

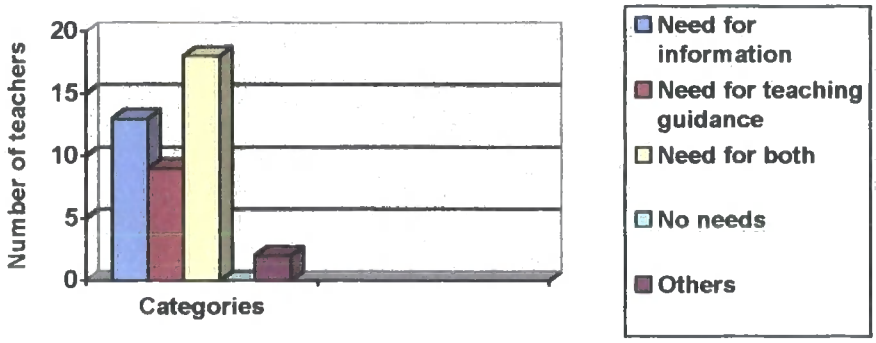
because all of us...read things in newspapers...magazines. But the issue is how we can present it to children." or "*...teaching guidance...We need ways of how we can approach an issue, original ways which can instigate children's interest...*".

Eighteen teachers (42.9%) asked for both information and teaching guidance. They claimed: "*Both, both...I've been a teacher for 11 years now and I have attended only one in-service training seminar for environmental education...*" or "*Both, we need both.*" or "*...as a teacher that I didn't have any training in university...I need scientific education and there is no such...I also need the means...to transfer these things to students.*" or "*I would say in both. I would like if there were more books regarding the environment...and teaching guidance...*" or "*...education to both, it would be necessary.*" or "*...I need more education in both...and particularly teaching guidance...Because we know a general way of teaching various things...*" or "*Both. Both knowledge and teaching guidance are needed...*".

There was no teacher to claim that they had no needs at all, while there were 2 teachers (4.8%) to claim general matters, such as: "*...What we would expect from the Ministry...new publications...video tapes, slides, films...audio-visual means for a better education...*" or "*I believe that I need more knowledge as far as children's psychology is concerned...and nothing of the two you mentioned...*".

Figure 32 shows that teachers needed both information and teaching guidance on environmental issues.

Figure 32. Greek teachers' needs in environmental education.



8.2.3 When was the last time you carried out an environmental project or you made reference to environmental issues in your teaching?

Twenty-two teachers (52.4%) claimed the school year the interview took place was the most recent time they made reference to the environment in their teaching. They said: "*We make references every day in the lesson... The last environmental thing we had, was through the language subject, where we were talking about people who live... in Athens... about car exhaust gases, about the emissions from factories... how much destruction they bring upon the atmosphere... upon our health... [that was] a week ago...*" or "*A month ago when we had a... lesson concerning the city, the village and the reasons why they were deserted... there were three lessons in the subject 'We and the World' and one lesson in the language subject.*" or "*...the last couple of weeks... we talked about nuclear factories, about polluted seas, waters, rivers, etc., about the forests that are burnt, about rubbish, that there's no recycling...*" or "*Yesterday, when we had a topic in physics... from the unit that had to do with the earth's atmosphere, the zones of atmosphere... We said some things mainly about the ozone... What could the consequences be... of having the ozone reduced in the future, on the planet. Where that is due to, how it can be prevented... It was general, theoretical... within the frame of the lesson, it must have been around 10 or 15 minutes.*" or "*Well, the programme is in progress and we make such references all the time... [the programme is about] the birds of our city. Thessaloniki's birds... I will do it again with the 2 extra hours per week...*".

Eight teachers (19%) mentioned that they had made such references the previous year. They said: "*Last year... It was about the nutrition of primary school pupils... we didn't have an extra hour... [It was] generally about food, what food is, the digestive system, groups of food... We talked about advertisements and about the over-consumption of products that we have today.*" or "*Taking the stimulus from that unit in our book... last spring... it was about recycling, about rubbish, about air, sea and soil pollution, about animals extinction, about the forests' destruction, about the ozone layer... the children worked on that for approximately one and a half or two weeks...*" or "*...last year I had an environmental school programme which was about our neighbourhood and we planted trees in the school grounds... we went on excursions, we went by foot to Saint Sila mountain and from there we looked at the plain... collecting... leaves for our plant album noticing all sorts of things, like soil erosion... we took pictures of the neighbourhood, we found*

old pictures of Kavala... whatever... we noticed like rubbish or plastic bags around us, we were making a point of it... In the school yard we planted trees, we created a small garden with flowers." or "*Last year... when I was teaching 5th grade, we talked about the hole in the ozone layer, about the satellites that take pictures of the earth and how someone can see the damage that has been inflicted on the earth... And in geography... when we were examining Greece, we talked about the forests... the birds that are becoming extinct, the water contamination...*".

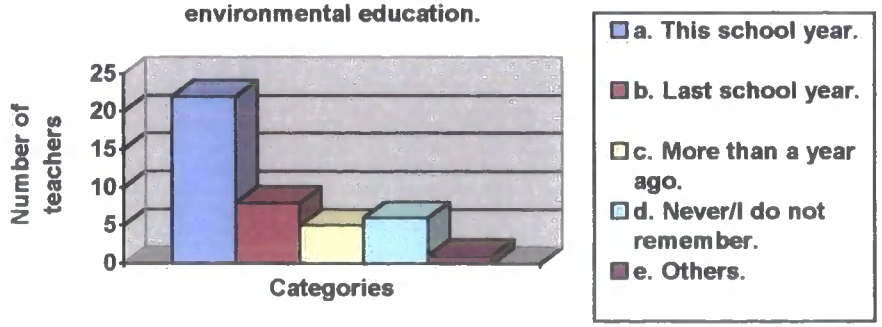
Only 5 teachers (11.9%) mentioned such instances that took place more than a year ago. They said: "*Three years ago we did an environmental programme... I did it in collaboration with most of the teachers... We... visited the place where the paper is getting together, then we visited the paper factory in order for children to see... We were 'stealing' some time from other subjects and that's how we were doing it.*" or "*We did a programme the year before last year... We did the recycling programme... was about... paper recycling. We had produced paper from other papers, we had the tools we needed... We had said that when we recycle, we gain forests, we gain oxygen... We were getting a lot of help from the paper industry 'Elina', which was collecting the paper we were gathering till last year.*" or "*Last time was three years ago... We did a programme with the school... about... a beach... to clean it... it was for a day... we're talking about the port... the cigarette ends that were in the sea, about plastic, tins, bottles and I emphasised to them the danger that a bottle may have... it may break and... it may hurt us...*". or "*...in '94, and it had to do with the surrounding environment of the school.*".

Six teachers (14.3%) said that they had never had such references or they could not remember them. They claimed: "*I never had such.*" or "*No, I haven't done any, no... I'm always referring incidentally...*" or "*Well, I cannot recall anything in particular... We didn't have any particular reference.*" or "*This year we still haven't done anything about the environment... so far the lessons we've been having, have nothing to do with the environment, that's why environment has been put aside.*".

Finally, 1 teacher (2.4%) mentioned general things, such as: "*I will teach this year... there is an information package that is called 'Cancer and nutrition' but because children are young, I don't want to be limited in that... it has general activities, but they are not enough for me...*".

Figure 33 describes the categories that emerged from that question and it presents the number of teachers belonging in each category.

Figure 33. Greek teachers' most recent practices of environmental education.



8.2.4 Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?

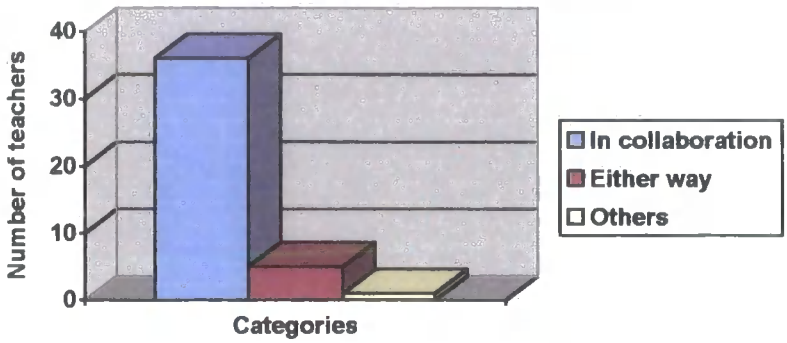
Thirty-six teachers (85.7%) believed that it was better to work in collaboration with their colleagues. They said: "*...I would like when someone takes up a programme, the others to help. This happens in general lines but not always...in collaboration the work is better and the presentation is more impressive.*" or "*Certainly in collaboration with colleagues because many views are heard...Someone on its own cannot achieve much.*" or "*...when you work with a colleague and specially with a colleague that has knowledge, you feel better...*" or "*Always in collaboration, because one person cannot take the load of such a big programme...One teacher on its own, it is very difficult.*" or "*I believe that it's better in collaboration with colleagues because various views are heard and opinions are given...that you hadn't thought of.*" or "*Always 2 or 3 people, so as to have more and various ideas. Certainly, collaboration leads to something better.*" or "*Certainly, when you collaborate with others that are interested in that, it's much better, because you exchange ideas, you hear opinions, you get help and you give help and that's how knowledge and activities are getting expanded...*".

Five teachers (11.9%) claimed that they could work either way. They said: "*...both on your own...but at the same time we are open to other colleagues...*" or "*The knowledge I need would give me the confidence I'm lacking now. It's not a matter of working with or without your colleagues. I believe in collaboration but I also believe in myself.*" or "*I don't think that there is any difference...if I could examine an issue in collaboration...I would do it, if I could do it on my own I would do it again with the same ease or difficulty.*" or "*I would have confidence either in collaboration or on my own, provided that I knew about it.*".

Finally, 1 teacher (2.4%) talked about general things such as: "*I think on my own...it's a way of work that expresses me better.*".

Figure 34 describes the categories emanating from that question and it presents the number of teachers belonging to these categories.

Figure 34. Greek teachers' working preferences.



8.2.5 Have you ever used your school's surroundings?

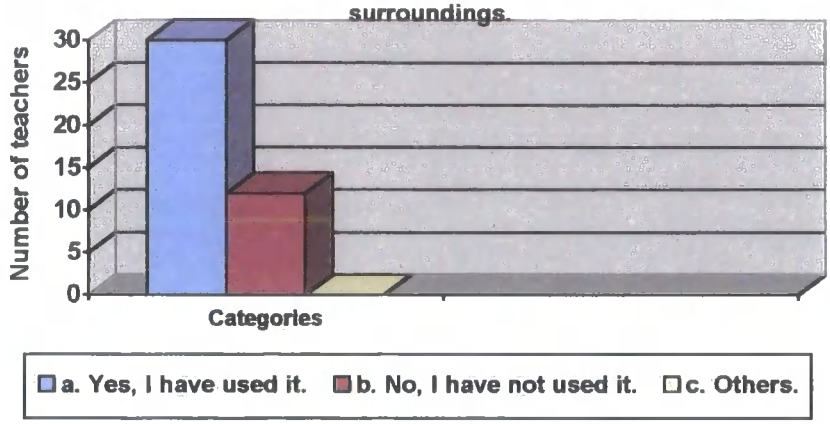
Thirty teachers (71.4%) claimed that they had used their school's surroundings. They said: "*Quite few...it comes to my mind the tree planting...two or three years ago...it was a school activity...both in school yard and to the surrounding streets...*" or "*...I used it once that it had rained a lot. There's a ditch here and much water had come down and the houses around were flooded...We discussed some things, how it is supposed to be, so as water can be accumulated in a place...I told them that there should be many trees for water to be kept back and for soil not to slide.*" or "*...We went out in school yard, we saw how many rubbish were there, we cleaned them...we dedicate a day for the cleanness of the school environment and of the environment around school.*" or "*Yes...we started by emphasising the bad things about the school yard...some neglected parts...lack of green...they organised a recycling scheme for paper, for aluminium. We had asked from local authorities to bring us recycling bins.*" or "*We used the school place in order to teach children about keeping places clean and how important is to have a clean yard where we live...*".

Twelve teachers (28.6%) said that they had never used their school's surroundings. They claimed: "*No, no, because it's not my speciality.*" or "*No, because I have never done an environmental education programme and I haven't used it.*" or "*No, unfortunately, no.*" or "*No, only a little bit in the classroom*

when... they painted their ideas about the environment and at some point we exposed these pictures at the rest of the school...".

Figure 35 indicates that teachers were using their school's surroundings to practice environmental education.

Figure 35. Greek teachers' use of their school's surroundings.



8.2.6 Are you engaged in any activities or organisations that will enable you to understand environmental education and plan any environmental activities?

Ten teachers (23.8%) claimed that they had such contacts with environmental agencies. They said: "*The Goulandri museum of Natural History, almost 70 forestries from all over Greece... The Museum of Natural History in Chrisoupoli, the Society of Animal Protection in Egina... the Prespes Society...*" or "*...We ask the collaboration from... the Ecological Movement of Drama... Usually we ask for information, printed material, posters.*" or "*...the only participation I have is in Greenpeace... and we help with financial donations.*" or "*Some times that I needed... material from Greenpeace, I came in contact with them... also, I collaborated with the Greek Ornithology Company for the construction of nests... There was a collaboration with the Seismologic Institute... there was a long lecture and they explained to pupils some things, concerning earthquakes and how they can protect themselves in school... I usually collaborate with university departments... now for a programme concerning the city... the local authorities are the least that you work with... we need to collaborate with the Byzantine Committees of the city, with the Byzantine Museum... the Office of Environmental Education... whatever sources exist, they are in our disposal.*" or "*...apart from*

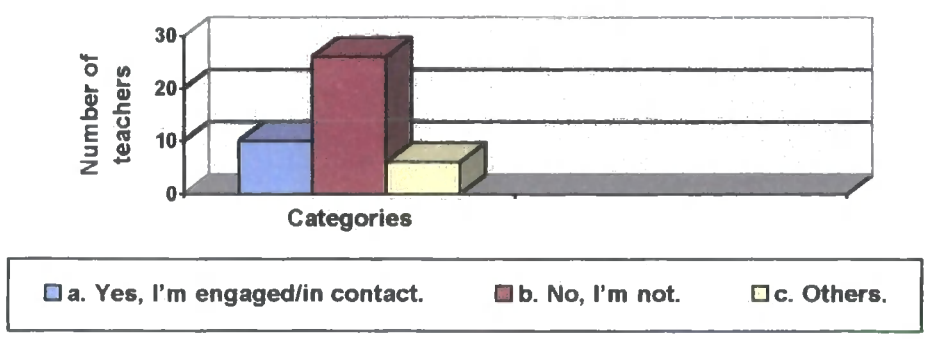
working with...the person responsible for environmental education in the Local Environmental Education office, I'm not working with others..." or "*Yes, Greenpeace and WWF. I'm getting information on what their activities are, through their campaigns and their leaflets which are concerned with the environment's protection. I contribute to their task financially. Their leaflets support my environmental knowledge but they don't give me teaching guidance.*".

Twenty-six teachers (61.9%) mentioned that they did not have any such contacts. They said: "*No...I'm not a member in any love-nature club or whatever.*", or "*No, I don't participate in any.*" or "*Unfortunately, no.*" or "*...I would like to be a member in such organisations...but I can't see how such a big organisation could help me...I'm not a member of any organisation but I think that my membership and my connection with them would be typical.*" or "*No, I don't have much time for that.*" or "*I don't have active participation, whatever it is possible to do in school, I do it.*" or "*No.*".

Finally, 6 teachers (14.3%) talked about general things, such as: "*...only...the Office [of Environmental Education] but whatever other ecological programme and whatever exhibition is happening, I watch them.*" or "*Simply some information and some leaflets and magazines...I still buy a magazine called Experiment...It is a scientific magazine with a general content but it has many references to issues which concern nature.*" or "*Not now...in the past...I used to go and listen to some things...there were relative speeches from various speakers...*" or "*...whatever I hear and I learn from mass media, from some magazines, from the National Geographic...I'm not subscribed but I'll just browse it.*".

Figure 36 indicates that most teachers were not in contact with environmental organisations.

Figure 36. Greek teachers' contacts with environmental agencies.



8.2.7 Have you attended any pre- and in-service training programmes for environmental education?

Twenty-four teachers (57.1%) claimed that they had attended in-service training programmes for environmental education. They said: "*Two years ago...I attended an in-service training programme in the Peripheral Educative Centre in Kavala...It was about 40 hours...They talked to us generally about environmental education...One thing that impressed me...had to do with the radio-energy and with the Chernobyl accident that affected the Balkans, the Northeast Europe...*" or "*Only one...Two years ago...Its topic was about the Cave of Mara...They presented to us various pictures from the inside, they told us that there used to be much water in the cave...They talked to us about the stalactites, the stalagmites, how they are formed, how many years they need to be formed.*" or "*Yes...it must be 4 or 5...They were organised by the consultant of environmental education...some of them presented to us environmental topics that had been realised in other schools...In another seminar there was information about the Pack for the Brown Bear and how we can teach it in school...Another seminar...had to do with the folkloric tradition. They gave us information on how we can teach in school the folkloric tradition...Usually, they were lasting 4 or 5 hours.*" or "*...we had a two hours seminar...concerned exclusively with issues that we could teach...It was on a national level...getting to know the environment, acquiring knowledge regarding the environment and basically, respect and protection of the environment...it was just an informative demonstration.*" or "*...I'm attending one lesson, within my degree's upgrading...is called 'Ecology and Environment'...We started with the significance of the oxygen in life, in forests, about the problems of the cities, road arteries. That sort of thing.*" or "*Yes, I have attended...one...Last year...It had to do with the nutrition and the population, the increase of population...It had to do with the development of civilisation in North and South, the inequality that there is, both the financial and the ecological. The topic was mainly ecological...it was 2 or 3 days...It was organised by the Education Department, here, in Thessaloniki.*".

None of the teachers had attended any pre-service training programmes for environmental education.

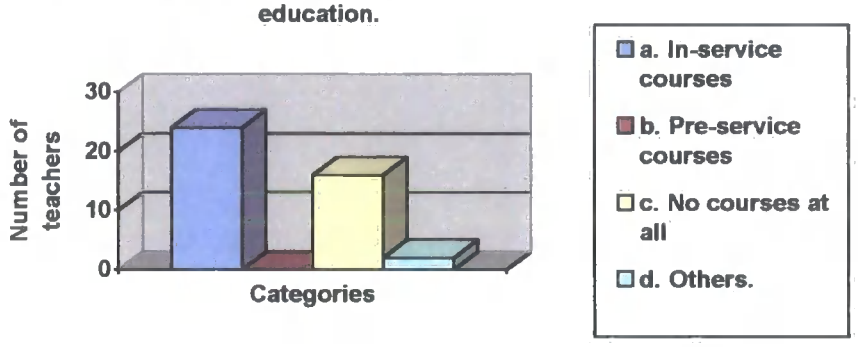
Sixteen teachers (38.1%) claimed that they had not attended any. They said: "*No, no.*" or "*No...There's no time, there's no much time to do something about environmental education as well.*" or "*No, never.*" or "*No...no, I'm not aware...*" or

"No...I wanted a seminar out in nature, in a bio-community...and...tell us...how to activate our children towards this direction." or *"No, I know that there were some but I never participated due to personal responsibilities."*.

Finally, 2 teachers (4.8%) discussed general things, such as: *"I'm in the process of upgrading my degree now and there is a subject for environmental education...I still haven't done it...I don't remember having attended any in-service training programme for the environment..."* or *"...as I'm upgrading my degree, within the curriculum that I have to be taught, there's both environmental and ecological...Yes, ecology in education...But we still haven't done any..."*.

Figure 37 shows that in-service training courses were more popular than pre-service ones. The same figure also, exhibits the number of teachers belonging in each category.

Figure 37. Greek teachers' preparation in environmental education.



8.3 Greek teachers' general environmental awareness.

The questions that investigated teachers' general environmental awareness asked teachers:

1. What do you think are the most significant environmental issues affecting the world today?
2. Why do you think that these are the most significant?
3. Where do you think your knowledge of environmental matters has come from?
4. There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?
5. Do you think we live in an environmentally literate society?

6. What about differences between developed and developing countries?
7. How do you see school's role in creating future environmentally literate societies?

8.3.1 What do you think are the most significant environmental issues affecting the world today?

Forty teachers (95.2%) discussed the damages that were inflicted upon earth. They said: "*...sea pollution, river pollution from factories waste...the car gases in cities...the nuclear testiness, the famous ozone hole...The big dams...*" or "*The ozone hole, the pollution from factories, from car gases, the over consumption of cleaning articles, our carelessness that causes fires in forests.*" or "*Environment's pollution, extinction of various species...energy sources.*", or "*The atmosphere...The ozone...carbon dioxide...yes, the ozone hole...*" or "*The ones that concern them directly. The fact that he cannot swim, that the seas are polluted...the nuclear ones...rubbish that are accumulated...*" or "*...the most significant is that one that has to do, directly, with man's health...the nuclear weapons...if it was possible for nuclear power to be replaced...by another form of energy.*" or "*...the pollution of the atmosphere...the local problems as far as transportation means are concerned, but mostly, the pollution of the environment...issues concerning extinction...*" or "*The pollution...pollution of the atmosphere, of food, of earth, of water...and the wasting of natural resources...*".

Two teachers (4.8%) claimed as such humans and their attitudes. They said: "*I think that man is the worst enemy of the environment and of himself.*" or "*The destruction of nature...through man's intervention, man intervenes and he destroys nature...man is intervening in the name of development but he ends up destroying nature.*".

Figure 38 shows teachers' beliefs as to what constituted significant environmental issues.

Figure 38. Greek teachers' ideas about the most important environmental issues affecting the world today.

8.3.2 Why do you think that these are the most significant?

Seven teachers (16.6%) talked about the consequences on the planet. They said: "*Because they are issues which threaten the planet.*" or "*Because they have a direct effect on the destruction of earth, on our planet...their consequences are going to be direct on the planet the forthcoming years.*" or "*I think that they affect the climate of the whole planet...*" or "*Because they will cause the destruction of the planet. We reach a point where we can say that the planet will survive unless man is not around.*" or "*In order to teach environmental education...the environment needs to exist. It tends to disappear what we call nature...*" or "*Because they have to do directly with the planet's existence. If there's a nuclear disaster, the planet is finished.*".

Twenty-seven teachers (64.2%) talked about the consequences on people. They said: "*If the ozone hole becomes bigger, then, surely that will have consequences on our health...Everything affects our health and generally our environment.*" or "*...because they concern him directly, in his daily life.*" or "*...they are the most vital, it's a matter of life or death...a matter of surviving ...for the man.*" or "*Because they bear direct relevance on man's life. On man's future life. Unfortunately, we see that the last years, when people destroy the environment, we destroy our life itself.*" or "*Because I think that these things create the conditions for man to live and if they disappear...I don't know if man's adjustment will be successful...nature will survive, we are going to be the ones to leave.*" or "*...man does not live only on bread and food, he needs to breath clean air as well.*" or "*Because they touch man's life...through these human life goes on existing or it gets destroyed.*".

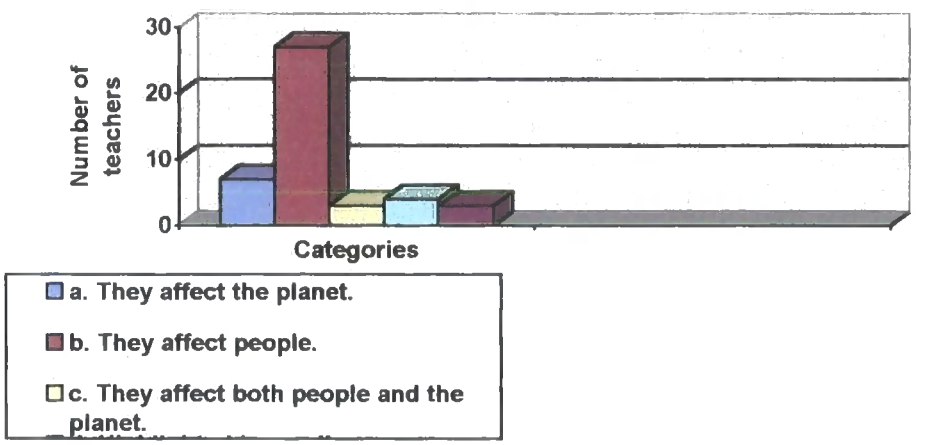
Three teachers (7.1%) talked about consequences on both people and the planet. They said: "*Because... they have to do with changing the sight of earth... and secondly for health reasons... they pollute man's life a lot... they shorten man's life.*" or "*Because they are problems which are visible to all of us. Everyone sees that there's pollution, everyone knows about the animals that they disappear, about the nuclear power and its ramifications.*" or "*Because without water, without air and without oxygen, I don't think that there's going to be life on planet.*".

Four teachers (9.5%) attributed the significance of the environmental issues to the media. They said: "*Because from what we read from newspapers, from magazines, from TV...*" or "*We already see, for instance, the el nino phenomenon that TV has shown to us so many times.*" or "*Because, maybe, I hear about them, they are often heard, maybe there are other more serious but they are not heard as much.*" or "*These are the ones I see around... We see them on TV, on radio, we read about them on newspapers...*".

Finally, 3 teachers (7.1%) discussed general matters such as: "*Because it's something that we cannot limit it... We cannot capture it...*" or "*...because it is.*" or "*Because as population increases, these problems increase as well... we need to find a solution to these problems because we won't be able to control them...*".

Figure 39 describes reasons that teachers were attributing to the significance of environmental issues.

Figure 39. Greek teachers' ideas concerning the significance of environmental issues.



8.3.3 Where do you think your knowledge of environmental matters has come from?

Five teachers (11.9%) attributed their knowledge to their personal interest, experiences and love for nature. They said: "*From the way I got to know the environment...I grew up in an environment where there were many trees, birds...one of my first games was the branches of a plan-tree which we were using them as a slide...*" or "*From my love to nature...from the worries I have on these issues...since I was a child, I loved animals and plants a lot.*" or "*I think only from my interest and love for nature...I'm interested in the environment I live, I grew up in a village...I lived in nature...*" or "*My knowledge is due to the love I had for the environment, generally, ever since I was a child...My father was an agriculturist and he used to take me with him...he made me love nature...I reached a point that things...I experienced and I loved, my children cannot see them and love them.*" or "*Ever since I was a young boy I had the sense of the environment...Discussing with people.*".

Twenty-five teachers (59.5%) attributed their environmental knowledge to the media, books, TV, newspapers and magazines. They said: "*Most of the knowledge I've got...I have acquired it with my involvement, twice, in these programmes...from the daily newspaper reading...I'm also subscriber in a magazine called the 'Earth'...*" or "*...from what I hear, I ask, I read if there's an article in a magazine or a newspaper, that's how.*" or "*...from general hearings...in mass media, in printed material, in magazines...*" or "*My knowledge comes from TV, newspapers, printed material, I haven't read any scientific magazines...*" or "*From mass media...and from books...*" or "*...from various magazines...from TV that has documentaries...from what I read and from what I hear daily...from seminars as well.*" or "*From leaflets, from the issues that we find in newspapers and in some books we read as teachers.*" or "*From TV, from magazines...from the news...*".

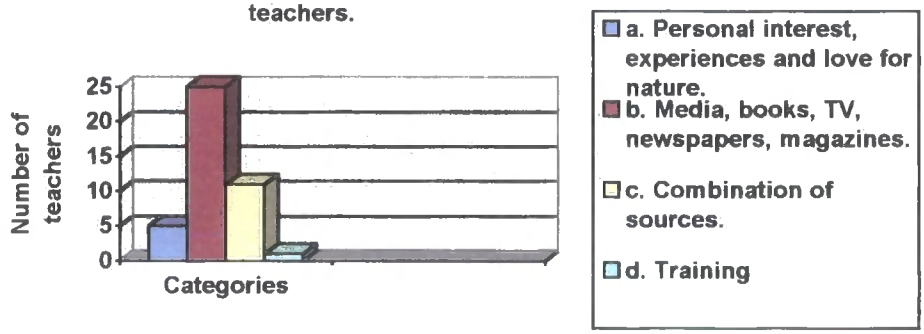
Eleven teachers (26.2%) discussed a combination of sources, that is, both personal experiences and media. They said things like: "*Mostly from books...from various discussions...since I were a young child because I come from a village so, I have a direct contact with the environment, with the water, with the plantations, with the birds, with the animals...my parents were cultivating vegetables, they weren't using fertilisers. They had the manure from the animals...*" or "*From newspapers, magazines, informative leaflets, from my own sensitivities, since a young child I was like that...*" or "*It's from a personal interest that I have in that issue...from*

wherever I can...a newspaper or a magazine...whatever book...since a young child I was in a farm...and I have many experiences from there, going up to our land with my father." or "*I mostly attribute my knowledge to where I come from...I come from a mountainous village and I'm sensitive as far as our countries' forests are concerned...from books...looking at books with animals, with plants.*".

Finally, 1 teacher (2.4%) attributed her environmental knowledge to her training. She said: "*...on an information level from the seminars I attended...*".

Figure 40 describes the categories and the number of teachers belonging in each category.

Figure 40. Sources of environmental knowledge for Greek teachers.



8.3.4 There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

Nine teachers (21.4%) claimed that formal sources were better. They said: "*Because...contains concrete information, instruction, directions that are scientific...I believe in specialised knowledge.*" or "*I believe that the TV as a medium for transferring information can give a lot to the people...I believe in TV as source of information because the audiovisual system has a stronger and a more lively effect on the human...books give us secure information and knowledge...*" or "*....it would be easier to pass something through TV rather than magazines...because not many people read magazines or newspapers, while TV is in all people's houses....*" or "*I wouldn't say from discussions, I think from books...what it needs, is a scientific information.*" or "*...More important is the way*

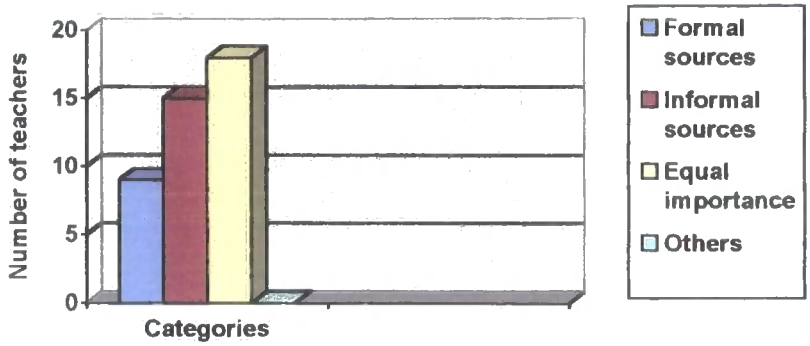
through mass media, books and magazines...Because they are wider...they are not limited to a society or to a region, they are addressed to all people...".

Fifteen teachers (35.7%) supported the informal sources. They said: "*...is more effective...living in a community which is sensitive to these issues...*" or "*...if you get activated with other people, you will get information but you will help as well.*" or "*It is more approachable. We leave formal types and we get into the essence of things...It's daily, it's the experiences we get.*" or "*Certainly the experiences we've got are very constructive because through them, you learn...and it stays with you...*" or "*I consider more effective...to live and to interact with other people...it gives more direct messages...*" or "*The best thing is to experience...*" or "*...the knowledge we get through experience is better more stable...stronger yes.*" or "*...it's the most vivid...it's more intense and the stimuli are much stronger.*".

Eighteen teachers (42.9%) gave equal importance to both formal and informal sources. They said: "*Both ways. The second one is something that we all experience...from that point onwards the formal source...is useful as well...*" or "*Both ways...personal experience is very significant...it is also necessary the scientific support...your personal opinion should be formed through life itself, through the scientific proof and through updating...*" or "*Both ways...one is covering the other. From books you get a theoretical knowledge...the daily contact adds to the theory.*" or "*Both ways...TV which combines picture and sound...when you learn something experiencing it...is much stronger...*" or "*...books give information but the development of sensitivity towards this issue comes only when there is a personal contact with the environment.*" or "*...both play an important role...books and documentaries...are better, but...the contact with others also helps.*" or "*...both ways are important...with the pictures and the information you get from newspapers and magazines you can learn many things. But personal experience is as important because unless you live something, you cannot become aware of it....*" or "*Both ways. Certainly, we need specialists to talk to us about...issues because they are well aware of them. But daily life...supply people with positive or negative knowledge.*".

Figure 41 indicates teachers' ideas regarding effective sources of environmental knowledge.

Figure 41. Greek teachers' views concerning the importance of environmental sources.



It is evident that even though teachers have acquired their environmental knowledge mostly through media, they considered that both formal and informal sources of information were as important to get effective environmental knowledge.

8.3.5 Do you think we live in an environmentally literate society?

Five teachers (11.9%) believed that we live in an environmentally literate society. Teachers claimed that: "*The messages that come say that Greeks don't respect the environment as much as other European citizens...I doubt [it]...in Greece there are still forests...of course the natural position...helps...natural forests...bio-communities...in Greece they still exist.*" or "*...today with all this information...and from mass media...people are definitely aware of what is going on around them...but I don't know what every person is giving...*" or "*...we are a country that are aware of the environmental problems but we don't do anything in particular...*" or "*...the world here is informed and sensitive regarding the environment...I believe that we take care of the environment...*" or "*...most Greeks are aware of nature...we don't make much effort to contribute to what we call environment's pollution.*".

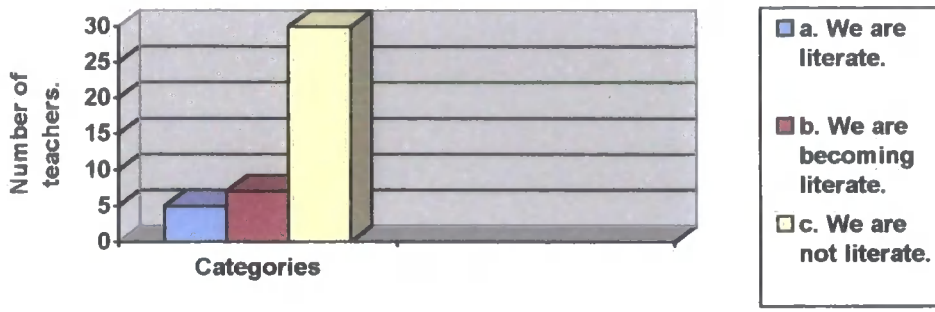
Seven teachers (16.7%) believed that we live in a society that is becoming literate. They actually said: "*...our society has just started to realise what does 'polluted' environment mean or what does 'destroyed' environment mean...now they start to take measures...*" or "*I can't say that all countries have realised as much the damage that man brings upon the environment...during the last years...[developing countries] have started to show some interest in the environment...*" or "*...I don't know what is happening in the world...from time to time there are some decisions*

regarding the environment but...I don't know how practicable they are..." or "*...the last years there has been some kind of sensitivity on these issues...*" or "*...in Greece we just start to learn. Europe is very much ahead as far as environmental issues are concerned. Because we don't experience the problem as intense...The more the problems get intense, the more people will get worried about them.*".

Finally, 30 teachers (71.4%) claimed that we live in a society which is not environmentally literate. They said: "*I believe that both developed and developing countries haven't realised the ecological problems. The developing countries...due to ignorance, apart from the Indians in the Amazon who love nature and protect it more...the civilised world, no matter how much they claim and discuss about the environment...they don't show the appropriate interest...their actions, their factories cause pollution in the name of profit. Environmental issues come in second place...I believe that our country hasn't realised that issue, maybe because we don't face such big environmental and ecological problems...*" or "*I don't think so...at least us, as Greeks...we don't care...when someone visits a forest, he eats, he drinks, he has a good time...but what will happen with the plastic bag or the plastic bottles of Coca-Cola?*" or "*I believe that we live in a society that it is not environmentally literate...from the situation I see around...*" or "*No, I don't think so...if we were aware, the things that are happening, wouldn't happen...*" or "*No, I don't think we are at the degree that we should be...We are not sufficiently informed...*" or "*...I believe that we are in a country and in a place where there's no information...a country that is interested in the environment, it should be a developed country...*" or "*Unfortunately, in the society we live the last years, we see that man doesn't love and doesn't respect the environment.*" or "*I don't think that we have the environmental awareness that we should have, here, in Greece...in relation with Europeans...western European countries have acquired environmental awareness quite few years before us. Here, for instance, it's difficult to find a bin, in my neighbourhood, which is for paper...there are no recycling bins...*" or "*In Greece I don't think that we have reached that level of awareness...This is due to education...*" or "*No, I also believe that not even developed countries have taken the appropriate measures...*" or "*If I judge from the country that I live in...people...are neither really informed nor conscientious of their role in protecting the environment.*".

Figure 42 brings forward teachers' belief that society is not environmentally literate.

Figure 42. Greek teachers' ideas concerning the environmental literacy of today's society.



8.3.6 Are there any differences between developed and developing countries as far as their environmental literacy is concerned?

Twenty-three teachers (54.8%) claimed that developed countries were more literate than developing countries. They said: "*...I think that the developed countries take more care...because their industry is more developed...But I think that they make sure they find ways to keep their balances...*" or "*...I imagine that when there's no education in some countries and when they have other basic problems...I don't think they are occupied with such issues...anyway, these are problems that exist mostly in developed countries.*" or "*...developed countries...started respecting the environment more than we do. We still don't have the sensitivity that they have, maybe because they destroyed it more than us...*" or "*Maybe in developed countries is better, these organisations may be more effective...the results of the destruction are more visible...Developing countries have financial problems...it's a luxury matter [the environmental issue]*" or "*I believe that there's more environmental awareness in developed countries...It's due to the fact that there's some more general information and people have heard and have seen more. Due to education...*" or "*...the developed countries have more developed environmental awareness and that's due to the fact that people there love and take care of the environment more...*" or "*In developed countries, maybe, there's some more awareness...because they have dealt with the rest of the problems and they have time to see their environmental education...they have solved serious needs.*".

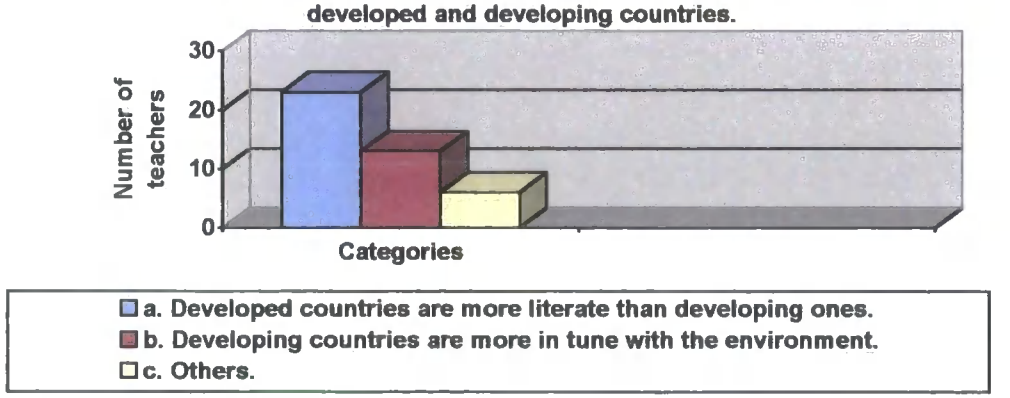
Thirteen teachers (31%) claimed that the developing countries seemed to be more in tune with the environment. They said: "*...I think that nature has been left*

only at the developing countries and it tends to be disappeared from there as well. The developed ones have ceased nature. They just try to reproduce it with technical means... There are no natural forests, they don't have bio-communities." or "*...I wouldn't say that the developed countries are more aware than the developing ones, for instance America... in a conference in Japan... didn't want to reduce their factory productions... at their economy's expense... All these industrial, developed countries, I don't know whether they would be willing to sacrifice something form their economy... in order to do something for the environment.*" or "*...The developing countries are in a much better situation... having in mind the experiences of the technologically advanced countries, they could be taught a very good lesson... it could be an example to avoid.*" or "*...I think that the developing countries have more environmental awareness because they live in the environment, the developed countries destroy the environment, because of 'civilisation'...*".

Finally, 6 teachers (14.3%) discussed general things such as: "*...I have to emphasise that it is not enough only teachers to carry out these environmental programmes... they are useless, if children both through their family environment and through their city and village environment don't realise certain things... the effort we make... stops...*" or "*...not even developed countries have taken the appropriate measures and as far as developing countries are concerned, I don't think that they have made even a beginning...*" or "*...knowledge is theoretical and I don't see anything practical happening... it is relative because we see the developed countries that they don't respect the environment... Whatever is happening in Europe, the same goes for here as well.*".

Figure 43 indicates that teachers contemplated developed countries as more environmentally literate than developing ones.

Figure 43. Greek teachers' views concerning differences between developed and developing countries.



8.3.7 How do you see school's role in creating future environmentally literate societies?

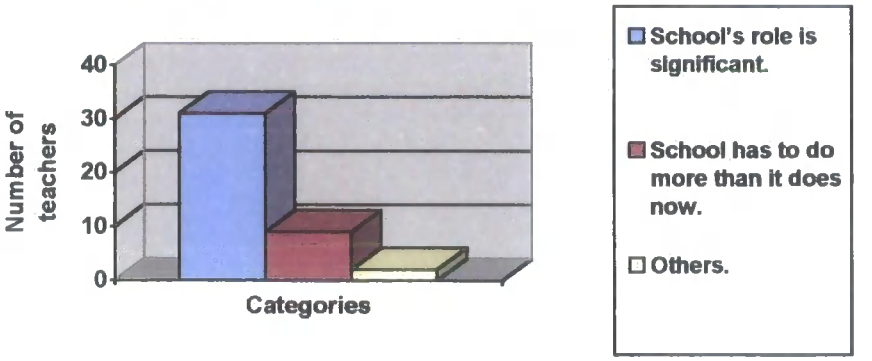
Thirty-one teachers (73.8%) claimed that school's role was significant. They said: "*School's role... is very important and irreplaceable... because pupils can learn about the environment from an early age...*" or "*I think that school's role is decisive because children... have a mind that it is tabula rasa and whatever they hear from the teacher... they want to do it...*" or "*Through such issues and generally through whatever chances we have, we should try to make children sensitive.*" or "*...environment should be part of education and children should start realising, since an early age, the significance of the environment.*" or "*...It can play a significant role and after school is family.*" or "*Very important... I don't think that parents can deal with that... children should get most of the stimuli from school, from the teachers. And children will make their parents sensitive.*" or "*...it has to be predominant. Children should be informed since an early age, so as after 10 or 15 years, people will have a sufficient awareness of environmental matters.*".

Nine teachers (21.4%) claimed that school needed to do more than it does now. They said: "*School's role is to give... teachers... specific programmes... we need some people to occupy themselves with that issue paying the necessary attention to it.*" or "*I would say that it's role was really important if it was working properly... if there were such programmes, if teachers knew how to teach environmental education in their schools.*" or "*...there should be a scientific preparation for teachers, there should be a subject concerning the environment which it should be written by specialists who know about the environment and not having it with incidental references and resting with teachers' good volition every time.*" or "*...Maybe there should be a specialist to teach the lesson and not expect everything from the teacher...*".

Finally, 2 teachers (4.8%) discussed general matters such as: "*With the right people... the right programmes... with teachers' sensitivity...*" or "*I believe that schools can play a role but not the only one. I think that the era when school used to be a determinant factor in the forming of a character... has ended... Today, there is TV, there are magazines, newspapers... family... and the environment that a child lives, contribute to its development.*".

Figure 44 describes the categories that emerged from that question and it presents the number of teachers belonging in each category.

Figure 44. Greek teachers' ideas concerning school's role.



According to the majority of teachers (73.8%) schools should keep on educating young pupils with respect to how important the environment is. A small percentage of teachers (21.4%) suggested that schools needed to do more than they do now, if we want to achieve future environmentally literate societies.

9. DISCUSSION OF THE ENGLISH FINDINGS AND KEY CONCLUSIONS.

9.1 Introduction.

This chapter is concerned with the discussion of the findings and of the general themes and categories of responses which have been derived from the teachers' replies. The preceding two chapters described what these findings and categories of responses were, while the current one will present how these findings relate to each other and what conclusions can be drawn from these. The structure of this chapter is defined by the study's own title. Hence, it will focus on teachers' awareness of environmental education, on teachers' motivation to teach environmental education and on teachers' general environmental awareness.

9.2 English teachers' awareness of environmental education.

English teachers regarded environmental education as a teaching procedure concerned mainly with the transmission of knowledge either about the local environment or about general environmental issues. Thus, education ABOUT the environment seemed to be the prevailing approach. English teachers considered it important to educate their pupils about their local environment. According to teachers, the local environment included issues such as the school grounds, its garden, the ponds and mini-beasts which might inhabit the school grounds and the village or town where they lived. In addition to the local environment, English teachers discussed also the teaching and learning of more general environmental issues as well. Their concerns included the countryside, pollution, global warming, recycling, rainforests, endangered species, greenhouse effect. English teachers' focus on education ABOUT the environment was also shown by their replies to the question concerning the school curriculum content of environmental education in the primary school. For both these questions, English teachers emphasised the acquisition of knowledge ABOUT the environment. Table 7 shows the percentage of responses for the three categories which describe environmental education in terms of transmitting knowledge (Local environment, General environmental issues and Both local and distant environments).

Table 7. English teachers' focus on education ABOUT the environment.

Categories	Definition of E.E.	Content of E.E.
Local environment	34.9%	46.6%
General environmental issues	18.6%	34.2%
Both local and distant environments	27.9%	–

Apart from knowledge ABOUT the environment, English teachers referred also to education FOR the environment in these questions which were concerned with arriving at a definition of environmental education and with its school curriculum content. However, the percentage score that education FOR the environment accrued was lower when compared with the percentage favouring education ABOUT the environment. However, education FOR the environment was referred to more frequently (72%) by English teachers when they discussed the most significant aspect of environmental education.

English teachers considered that the ultimate goal of environmental education should be the inculcation of values and respect towards the environment. Most teachers (72%) replied that pupils should develop positive attitudes towards the environment when they were asked to talk about what was for them the most important aspect of environmental education. Thus, education FOR the environment was deemed to be very significant as it seemed to constitute the ultimate goal of environmental education. That is, English teachers believed that environmental education should aim to create citizens who behaved responsibly towards the environment. However, it was demonstrated earlier that education ABOUT the environment was prevalent in the teachers' replies from which a definition of environmental education and its curriculum content were constituted. English teachers did not discuss education FOR the environment in their responses to the questions which asked teachers to describe environmental education and its school curriculum content as much as they did when they discussed what they believed to be the most significant aspect of environmental education. Table 8 records the percentage that education FOR the environment has acquired through these questions (the question asking for a definition of environmental education, the

question asking to describe its curriculum content and the question asking for its most significant aspect) and compares it with the percentage which education ABOUT the environment gained. Education ABOUT the environment is denoted by three categories, namely Local environment, General environmental issues and Both local and distant environments, while education FOR the environment is denoted by one category, namely Developing a Positive Attitude. The creation of these categories was based on teachers' replies to three questions; one question concerned a definition for environmental education, another the school curriculum content for environmental education and the third the most significant aspect of environmental education.

Table 8. English teachers' perceptions of environmental education.

Categories	Definition of E.E.	Content of E.E.	Most significant aspect of E.E.
Local environment	**34.9%**	**46.6%**	20.9%
General environmental issues	18.6%	34.2%	9.3%
Both local and distant environments	27.9%	–	–
Developing a Positive Attitude	16.1%	37.3%	**72%**

The percentage that education FOR the environment accrued (72%) was greater than the percentage that education ABOUT the environment (20.9% and 9.3% for local environment and general environmental issues respectively) gained when teachers discussed the most significant aspect of environmental education. While the percentages that education FOR the environment acquired when teachers defined environmental education and when they discussed its curriculum content (16.1% and 37.3%) were lower in comparison with the percentage that education FOR the environment (72%) acquired when teachers were asked to consider the ultimate goal of environmental education. Hence, one could argue that whilst English teachers

focused their practice of environmental education on education ABOUT the environment, it was education FOR the environment that they saw as the ultimate goal which environmental education should aspire to achieve.

The third dimension of environmental education, that is education IN the environment was thoroughly endorsed by English teachers. Most of them (81.4%) considered this to be the best way to present environmental knowledge to pupils, that is by giving them first-hand experiences. English teachers discussed first-hand experiences in terms of: "*By visits...practical activities where they can actually have 'hands-on' activities...*" or "*...'hands-on'...rather than just telling them...collecting newspapers and collecting cans and recycling them...*" or "*...taking them out...going outside looking at our school, it has to be practical...have visits to the farm and to the coast and river...*". The English teachers perceived the teaching of environmental education as something that needed to be different from the teaching of the other disciplines. They did not refer as frequently to expository methods where teachers lecture and write on blackboards while pupils take notes. Most of them thought that environmental education should be vivid for their pupils and that it should motivate the children's interest by encouraging them to discover knowledge on their own, using all their senses.

The English teachers viewed the teaching of environmental education as something already familiar in their practices and as an important feature which characterised good schools and good teachers. Even though environmental education is not established as a separate subject in the school curriculum and considering that the National Curriculum in England was introduced in the 1988, it was encouraging that 34.9% of the English teachers thought that environmental education has always been part of the school curriculum and another 34.9% of them thought that it has existed for a substantial time, 10 years or more. The English teachers viewed environmental education as a permanent element of the school curriculum and of school life. Some of the teachers' replies were indicative of this attitude. Teachers claimed: "*...it's always been in the curriculum...now it's become much more prescribed...*" or "*...before the National Curriculum lots of teachers did still do this sort of thing and use the local environment to teach the children as much as they could about the plants and birds...*" or "*...it's been in existence for as long as the school curriculum has been in existence...it started off...as nature lessons...the National Curriculum...brought a structure to what was already in place. I think a lot*

of good schools and a lot of effective teachers were already doing it and prior to the National Curriculum...". This suggests that the English teachers thought environmental education to be an inherent part of the school curriculum and school life.

Also, the ages of the pupils did not seem to prevent teachers from teaching environmental education as 90.7% of the English teachers considered all student ages to be appropriate for environmental education. Moreover, teachers mentioned that the sooner pupils start to be educated about the environment, the better.

As was mentioned before, English teachers considered environmental education to be a permanent element of the school curriculum and school life. There is no specific subject entitled environmental education in the English National Curriculum and the English teachers did not suggest any changes to that. A considerable percentage of English teachers (48.8%) thought that environmental education would be best implemented in the school curriculum through topics, while 39.5% of them claimed that environmental education could be realised through separate subjects. English teachers did not wish to have environmental education as a subject in its own right. They believed that it is better for environmental education to be spread over the school curriculum. Most teachers (48.8%) suggested topic work since topic work is a common way of working in the primary school anyway. The National Curriculum actively promotes the teaching of environmental education either as a topic or through the subject disciplines that teachers already teach. In chapter 4 the English National Curriculum was overviewed and such environmental references in various subjects were detected. The English teachers' opinions about not having environmental education as a separate subject in the school curriculum was complemented by their views concerning how long environmental education has existed as part of the school curricula. Most teachers claimed that environmental education has been in the school curricula either for ever or for a very long time (34.9% and 34.9% respectively). It is therefore possible to conclude that the English teachers did not think that environmental education should constitute a subject in its own right as they believed that it has functioned satisfactorily in the school curriculum for so long.

Finally, the English teachers exhibited knowledge of national publications, of local initiatives and of national, international and local organisations. English teachers were aware of national publications such as those produced by 'Learning

through Landscapes', the magazine from the Royal Geographical Society, the 'Curriculum Matters' edition concerned with environmental education, the magazines 'Primary Geography' and 'Green Teacher' and the book 'Environment in Question' by Cooper and Palmer (1992). They were aware of local initiatives such as those undertaken by Local Authority Leisure Services Department or more specifically competitions such as the Lord Mayor's Cup in Newcastle, another one organised by the County of Durham which both encouraged primary schools' participation. Teachers said that: "*...I subscribed to Learning through Landscapes...I've had...liaisons with agencies like the Local Authority Leisure Services Department and...the Forestry Commission...*" or "*...Durham has individual competitions...that encourages schools to take part in...last year there was a competition to design and build a butterfly garden...*" or "*...an area near here called the Scrambles which the local council have taken over as an area of natural beauty and conservation...where you can take children...and it has a wide diversity of habitats....*". National and regional organisations that were discussed by English teachers included the Northumberland Wildlife Trust, 'Keep Britain Tidy' and 'Save the Whale' which was a campaign launched by Greenpeace. Apart from national organisations, English teachers also mentioned international ones such as Greenpeace and Friends of the Earth. Finally, the English teachers referred to local organisations namely one called 'Green fingers'. Only two teachers discussed how Greenpeace and Friends of the Earth could help schools provide environmental education; the other teachers who mentioned these organisations, simply reported that they were aware of their existence. The two teachers claimed that: "*...Greenpeace sends posters and parcels of information.*" or "*...all of the major environmental organisations like Greenpeace...Friends of the Earth...they all have something to say about what they think you should be teaching...some times that has an influence...*".

The English teachers' knowledge of environmental organisations, publications and other initiatives was also indicated by the teachers' replies to the question regarding teachers' contacts with such organisations. Fourteen per cent of English teachers claimed that they were in contact with environmental agencies and they referred again to publications such as those from "Learning through Landscapes", the Northumberland Wildlife Trust, local authority in planning departments, Green fingers, the Local Education Authority, Oxfam, Greenpeace, RSPCA and Friends of

the Earth. The same two teachers who mentioned Greenpeace and Friends of the Earth went on to mention the information they get from these agencies. One teacher said that: "*...I used the Oxfam video...I used the Greepeace leaflet but I haven't used anything else.*" and the other said: "*...I'm a member of Friends of the Earth...I get information from them...I'm kept fairly well up to date.*". It is encouraging that teachers whose commitment to environmental education cannot be taken for granted, were in a position to discuss various publications and organisations that helped them practice environmental education.

Apart from the teachers who discussed environmental organisations and publications and they said that they were in contact with environmental agencies, there was a 46.5% of the English teachers who were not aware of any environmental organisations, publications, conferences or other initiatives and a 53.5% who were not in contact with them. Hence, it could be argued that almost half of the sample of the English teachers was neither aware of nor in contact with environmental organisations, with publications and with local initiatives. Nevertheless, it is necessary to mention that significant conferences for environmental education such as those in Stockholm in 1972, in Tbilisi in 1975, in Rio de Janeiro in 1992 were not mentioned by teachers. Only one teacher said that she was aware that Newcastle had a Local Agenda 21 but she was not able to discuss it. She said that no course had been held to explain to teachers what Agenda 21 was about. Thus, apart from the world-wide organisations such as Greenpeace and Friends of the Earth that the teachers mentioned, the English teachers referred to organisations, initiatives or publications which had either a national or local character. It could be argued that this knowledge of what was happening locally and nationally indicated teachers' interest in environmental education, but on the other hand, it is clear that teachers were not aware of the major events which defined the character of environmental education. Of course, it is reasonable that teachers were more likely to become aware of publications and organisations that concerned their job directly and gave them tangible support (e.g. material, information, teaching instructions) and that their ignorance of major conferences and publications concerning environmental education could be attributed to insufficient preparation and training in environmental education. Certainly, the Stockholm conference of 1972 or the Rio de Janeiro conference of 1992 and the ensuing Agenda 21 are important milestones in the development of environmental education. It seems, not surprisingly though, that

the teachers were not as interested in finding out about the history of environmental education as they were in gathering tangible material that could help them practice environmental education. This kind of context setting information should be given to teachers during initial training when teachers have the 'luxury of time' to examine in more detail precisely what environmental education entails, how it has developed and how they can best practice it. This chapter now gets on to show that teachers' pre- and in-service training in environmental education has been limited, which goes some way to explain why teachers have a limited knowledge about environmental education.

In conclusion, one could argue that English teachers emphasised education ABOUT the environment as far as their practices were concerned since knowledge about the environment was the prevalent concern in the teachers' replies which led to their definition of environmental education and what they thought should describe its curriculum content. The English teachers referred to the environmental organisations, publications and initiatives that they were both aware of and in contact with. These agencies helped teachers practice environmental education mainly by supplying them with material such as posters and parcels of information. However, the English teachers were not able to discuss initiatives, conferences and publications that have determined the character of environmental education. It seems that the information on environmental issues which the English teachers received emanated mostly from the environmental agencies that the teachers mentioned they were aware of and in contact with; the media also provided them with environmental knowledge. In addition, teachers' training dealt mainly with factual knowledge about various issues. It is therefore expected that the English teachers defined environmental education and discussed its curriculum content in terms of transmitting knowledge ABOUT the environment.

9.3 English teachers' motivation to teach environmental education.

A vast majority of English teachers (90.7%) claimed they did teach environmental education. At this point, English teachers also described how they taught environmental education. That is, they clarified that environmental education did not constitute a school subject in its own right but they taught it either through topics or through stimuli they got from the other disciplines they taught, namely geography, science, history, English, personal and social education. Thus, the

English teachers did consider environmental education when they taught other disciplines. Teachers could have claimed that they did not teach environmental education due to timetable constraints. However, they thought that environmental education should not appear into the school curriculum as a separate subject. The fact that environmental education did not have a particular time period allocated to it in the timetable did not seem to prevent teachers from teaching it.

This was also indicated by the fact that teachers were able to discuss instances of teaching environmental education either from the school year that the interview took place or from the year before. The majority of English teachers (74.4%) discussed examples of practising environmental education from the school year that the interview took place, while the remaining 25.6% discussed instances from the previous year. Their environmental education practice concerned local studies, studies about the animals and birds of their school, about the trees of their school, about transport and their village, about the school playground, about litter, about rivers, about other near by locations. All these things are included in the National Curriculum as it was presented in chapter 4. It is clear that teachers' practice of environmental education was concentrated upon the school premises and the pupils' local environment. Most teachers (90.7%) reported teaching environmental education and only 9.3% said that they had never made any such references. An interesting finding was that even though 9.3% of the teachers said that they did not teach environmental education, all teachers reported instances of teaching environmental education at some point. This could be explained by the fact that for some teachers the discussion during the interview helped them realise that they had taught environmental education without even having thought about it. The reason teachers gave for teaching environmental education was not only personal preference but also the existence of National Curriculum guidelines as well. The National Curriculum expects teachers to make environmental references in various disciplines and, the geography syllabus prescribes the investigation of different localities. Considering the fact that these teachers' commitment to environmental education cannot be taken for granted and the fact that there is no specific school subject called environmental education, it is encouraging that English teachers took advantage of the guidelines the national Curriculum gave them to teach environmental education.

The English teachers' contacts with environmental organisations were discussed earlier in the section 10.2 in relation to the question concerned with teachers' knowledge of environmental organisations, publications, local initiatives and conferences that have determined the character of environmental education. Furthermore, it is possible to examine the findings of this question (whether, that is, teachers were in contact with environmental organisations) in relation to the findings of the question concerned with teachers' practices of environmental education. Hence, only 12.8% of the teachers who said they taught environmental education were also in contact with environmental organisations, while 51.8% had no such contacts. Table 9 shows this and the percentage of teachers who claimed that they did not teach environmental education and what were their contacts with environmental organisations. Thus, it becomes evident that teachers taught environmental education without seeking any particular support.

Table 9. English teachers' contacts with environmental organisations.

Number of teachers	Being in contact with organisations	Not being in contact with organisations
From a total of teachers who admitted teaching EE (39)	12.8%	51.8%
From the total of teachers who do not teach E.E (4)	25%	75%

The English teachers preferred to work either in collaboration with their colleagues (58.1%) or both in collaboration and on their own (41.9%) without having any particular preference. The teachers who endorsed collaboration with their colleagues discussed the advantages that this way of working has. Such advantages included exchange of ideas, relying on more than one teacher to plan an activity or a topic, be sure that various issues will neither be omitted nor repeated many times. Teachers claimed: "*I prefer to do it with colleagues because it is useful to get lots of ideas...*" or "*...it's better in a group because you can bounce ideas off people and you can get suggestions...*". Moreover, the English teachers raised another reason why they preferred working in collaboration with their colleagues and that reason was lack of knowledge. Teachers said: "*...with my colleagues because I don't think*

I personally would have enough information...my actual knowledge is probably quite limited..." or "*...I don't feel like I know sufficient about environmental issues. So the more brains that work on the plan, the better really.*". Despite the problems that teachers faced due to lack of environmental knowledge, teachers attempted to overcome it by working together. Thus, the English teachers provided both positive (e.g. lots of ideas) and negative (e.g. limited knowledge) explanations when they justified their choice regarding collaboration with their colleagues. Nevertheless, the 41.9% of teachers who did not mind working on their own or in collaboration, stated that they have already worked both ways and they found it easy do both. Teachers said: "*...it would be nice to do it with other teachers...but I wouldn't mind doing it on my own either, I'm quite happy doing both.*" or "*I wouldn't mind doing it on my own but I quite like working with others...either...I wouldn't be bothered about.*".

The English teachers revealed their perceived competencies in environmental education when discussing their needs in environmental education. Information or both information and teaching guidance on environmental issues were what English teachers felt they needed the most. If examined separately, teaching guidance on how to deliver environmental issues showed a lower percentage (9.3%) in comparison with teachers' declared needs for information on environmental issues (34.9%). The same percentage (34.9%) of teachers described a need for both information and teaching guidance. The English teachers claimed that information was necessary if they wanted to teach environmental education. Provided they had the right information, then teaching became easier since they have learned how to deal with the teaching of different disciplines. For instance, teachers claimed that: "*Information rather than guidance...we have enough expertise to know how to approach an environmental matter, [it] is the factual information that is missing.*" or "*...you would need more information...we all know how to approach it...we all sort of know how to deal with it.*". On the other hand, 20.9% of the teachers claimed that they had no needs at all. They attributed their sufficient level of knowledge to their own reading, to the fact that they were members of societies, to the fact that: "*...the world of education is awash with publications and ideas and suggestions and activities...*". Thus, one could argue that environmental education and teachers' competencies in it were once again defined in terms of factual information which reflected the teachers' belief that environmental education should primarily be ABOUT the environment. Unless teachers have the information on environmental

issues, they said they cannot teach environmental education. In addition, lack of information was one of the reasons that English teachers referred to when they explained why they preferred working in collaboration with colleagues rather than on their own. Table 10 describes the English teachers' needs in environmental education based on the way they preferred working, that is either in collaboration with colleagues or both in collaboration with others and on their own.

Table 10. English teachers' needs in environmental education.

Teachers' Needs	Working in Collaboration	Working either way
Need for Information	32%	38.8%
Need for Teaching Guidance	12%	5.5%
Need for Both	44%	22.2%
No Needs	12%	33.3%

From this, it is clear that 38.8% of the English teachers who preferred working either way, primarily need information, while 44% of the teachers who preferred working in collaboration have asked for both information and teaching guidance. The percentage of 33.3% shows that whilst a proportion of English teachers had full confidence in their ability to teach environmental education, the low figure of 12% demonstrates that teachers who stated they preferred working in collaboration lacked self-confidence in the teaching of environmental education, even though their collaboration with colleagues.

The English teachers were not only willing but also keen to teach environmental education. Most of them (97.7%) said that they have used their school's surroundings to teach environmental education. Thus, teachers perceived stimuli not only from the disciplines they taught and the National Curriculum guidelines but also from their surroundings. Such stimuli that teachers have taken advantage of included the school playground, school wildlife gardens and ponds with trees and mini-beasts, the village or the town where the school was situated, litter in the classroom and in the school playground. It is clear that the school premises provided many opportunities for teachers to teach environmental education. The English teachers mentioned local nature parks where they could take

their classes, but their discussion was centred around the school premises and the village or the town where the school was situated.

The majority of English teachers (62.8%) had not attended any pre- or in-service training courses for environmental education. A small percentage (18.6%) had attended in-service training courses and a smaller percentage (9.3%) had participated in courses at initial training level. The kind of in-service training courses English teachers discussed were about the local area and the protection of its wildlife, about sustainability, about drug awareness, about the creation of a pond in school, about gardening and how to develop an environmental garden, about harmed life and land reclamation, about map-reading using the environment, or geography and science based courses. The pre-service courses English teachers discussed were part of their PGCE preparation concerned with mini-beasts in the school grounds and how to care for them or modules for environmental education that they had attended in university. The kind of knowledge about environmental education which the English teachers discussed and which indicated their definition of environmental education and what they thought the curriculum of environmental education content should be, coincided with the content of the training courses teachers had attended, which is not surprising. For instance, the school garden, the school pond and the study of the mini-beasts were included in teachers' training courses and teachers' suggested all of these in their replies when asked what content would be appropriate for environmental education. The English teachers claimed that environmental education was present in their pre-service training within science and geography. They also considered that environmental education could be found in science and geography in-service courses as well. However, there were few teachers who distinguished between the geography and science courses and courses for environmental education. It is clear that environmental education has not been greatly infused in teachers' education and preparation. A discouraging feature was that many teachers (62.8%) had not attended any in- and pre-service training courses. However, it became more discouraging when teachers claimed that: "*...I know we've got a book that is available for courses but again the constraints of money in the school doesn't always allow you to go on the courses.*" or "*...it would come in to other things...it's not a subject that has a high profile.*" or "*...when we send people for training, usually they have a specialist subject...Our training follows our development plan for two subjects each year. Environmental science will*

be addressed formally in 2000." or "*...if you're interested, you can find out...I haven't looked for them...*". Hence, one could argue that there were pre- and in-service training courses for environmental education but due to financial constraints (e.g. "*...constraints of money in the school...*") and to schools' other priorities (e.g. "*...not a subject that has a high profile*"), these training courses were not often attended by the teachers. This was also reinforced by the small percentage of teachers who had attended pre- or in-service training courses for environmental education and taught environmental education. It became clear that few teachers had any preparation in environmental education. From the total of teachers (39) who claimed that they taught environmental education, 15.3% had attended in-service training courses, 12.8% had attended pre-service training courses and 61.5% had not attended any courses as it is indicated in table 11.

Table 11. Frequency of course attendance by English Teachers.

Number of teachers	Having attended in-service courses	Having attended pre-service courses	Not having attended any course
From a total of teachers who admitted teaching EE (39)	15.3%	12.8%	61.5%
From the total of teachers who did not teach E.E. (4)	25%	_	75%

It seems that the attendance of either in- or pre-service training courses did not influence teachers' decision to teach environmental education. The percentages above show that teachers' choices to teach environmental education or not, were hardly defined by pre- or in-service training courses. 61.3% of the teachers who claimed that they taught environmental education did not attend any course for environmental education, while 25% of the English teachers who claimed that they did not teach environmental education had attended in-service training courses.

Even though the percentage of English teachers who had attended a training course was low (18.6% for in-service and 9.3% for pre-service courses), it is worth

remarking that not one of them discussed their training as a main source of their environmental knowledge. Instead, the media appeared to constitute the major source of their environmental knowledge. 41.9% of the English teachers described formal sources such as books, media, TV, newspapers and magazines as sources of their environmental knowledge. Another 41.9% discussed a combination of sources which, as well as the media, also included teachers' personal experiences in the outdoors and training. Training as a source on its own represented just 7% of the English teachers' replies, while personal experiences in the outdoors as a single influence was cited by only 9.3%. These percentages clearly emphasised the lack of preparation for the teaching of environmental education that teachers underwent. Surely, teachers did not rely on knowledge gained form the mass media to teach English, history or mathematics. It could be argued that the sample of the current study has formed its opinion about environmental issues based on what they have seen, heard and read in the media. This would not be surprising since the terms 'environment' and 'environmental problems' are often mentioned and discussed in newspapers and on TV. The very small percentage of English teachers (9.3%), who defined the source of their environmental knowledge as their personal experiences in nature and their interest in it, demonstrates how humans have distanced themselves from the natural environment. That leads to 'study' nature rather than getting to know nature through experiencing it.

Overall, one could argue that the English teachers were positively inclined towards environmental education. Environmental education was viewed as an important and permanent element of education that all teachers should consider. Their motivation to teach environmental education was demonstrated by the fact that they did so. It seems that the National Curriculum has helped only in so far as it has forced more teachers to be aware of environmental education and start practising it. The English teachers indicated that they took advantage of the opportunities that both the National Curriculum and their surroundings gave them to teach environmental education. Problems such as lack of knowledge were dealt by teachers with choosing to collaborate with colleagues. The English teachers' knowledge came mainly from the mass media since few of the teachers had attended any pre- and in-service training courses for environmental education and only 7% mentioned their training as their main source of environmental knowledge.

9.4 English Teachers' general environmental awareness.

So far the chapter has discussed teachers' awareness of environmental education and their motivation to teach it. Teachers' general environmental awareness will be shown by highlighting what teachers' perceptions of significant environmental issues were, and from where this significance arose. The section also discusses views on how effective environmental knowledge can be achieved, what teachers believe to be the world's environmental status today and what they think the school's role is in creating future environmentally literate societies.

Most of the English teachers (86%) discussed as significant environmental issues the damage that was inflicted upon earth. That is, they referred to pollution, to greenhouse effect, to global warming, to waste, to the abuse of resources, to climatic changes, to the extinction of species. The English teachers perceived the environment in anthropocentric terms. A considerable percentage of teachers attributed the significance of various environmental issues either to the consequences they had upon people (28.2%) or to the attention they were given in the media (28.2%). This was significantly more than the teachers who considered environmental issues either in terms of the consequences on the planet (12.8%) or in terms of the consequences on both the planet and its human inhabitants (7%). It became evident that there was an anthropocentric element that prevailed in teachers' thought. No one can argue that this makes sense up to a point, since we are humans and we have ourselves and our well-being as reference points. However, it is only fair to wonder about other life forms on the planet and how they cope with all the problems. It is interesting how teachers could claim that the most important aspect of environmental education was to inculcate in pupils values, respect and caring feelings towards the environment, but at the same time they failed to realise how other forms of life are affected as well. It can be assumed that the message contained within this attitude invites people to be more considerate towards the environment because otherwise it will be our species which is faced with extinction.

In section 10.2, it was shown that the English teachers had acquired their environmental knowledge mainly from the mass media or from a combination of sources which included the media along with teachers' experiences in the outdoors and their training. The English teachers also claimed that if someone wanted to acquire effective environmental knowledge, he/she needed to rely on both formal and informal sources. At the same time, though, the percentage that the informal

sources (30.2%) accrued was higher than the percentage that the formal sources (18.6%) accrued, if examined separately. Teachers' preferences for using informal sources rather than formal ones was consistent with their view on environmental education taking place IN the environment. The English teachers claimed that first-hand experiences (81.4%) was the best way to present environmental knowledge to pupils. Informal sources of environmental knowledge included first-hand experiences in the outdoors. Thus, the English teachers perceived informal sources as more important in the acquisition of effective environmental knowledge. Such a finding is remarkable since many teachers (41.9%) discussed formal sources as their main source of environmental knowledge. Teachers, that is, have perceived that reliance on information carried in the media alone cannot lead to well-informed citizens. Informal sources, that is experiencing nature, played a significant role as well.

Most of the English teachers (76.9%) had a pessimistic opinion regarding the planet's ecological state, as they felt that we lived in a society which was not environmentally literate. While those who claimed that society was becoming environmentally literate (39.5%) or that it was environmentally literate (23.1%) appeared to be more optimistic. These were the three categories that were emerged from teachers' replies to the question whether we lived in an environmentally literate society or not. At the same time, the English teachers considered developed countries more environmentally literate than the developing countries (58.1%). Only 14% of the teachers contemplated that developing countries were more in tune with the environment. Teachers did not discuss any particular features that could justify their beliefs on whether our society was or was not environmentally literate, though they referred to the mass media and its role in peoples' life as the most prominent source of environmental knowledge. This was the reason why a majority of the teachers (58.1%) saw developed countries as more environmentally literate than developing ones. In addition to the aforementioned mass media, they also attributed the reason for this to education, to democratic regimes, to better economies and to the fact that developed countries have solved problems concerning survival and therefore could more readily afford to work on their environmental problems. In all three categories which endorsed that we lived in an environmentally literate society, that society was becoming a literate one, or that it was not a literate one, the idea that developed countries were more literate than the developing ones prevailed (66.6%,

58.8% and 55% respectively). Few teachers considered that developing countries were more in tune with the environment (16.6%, 20% and 5.8% respectively). Here, one can discern the technocentric ideas that underpinned teachers' perceptions concerning the environmental literacy of developed and developing countries. The teachers' main arguments which endorsed the superiority of developed countries' environmental literacy over the environmental literacy of the developing countries centred around the existence of advanced economies, of media, of education and of advanced technology.

The paradox was that teachers acknowledged that developed countries had more environmental problems than the developing ones, since developed countries had a far greater degree of industrial development. Only 14% of the teachers claimed that developing countries seemed to be more in tune with the environment. They attributed that either to the fact that these countries did not have many factories to pollute their environment, or that people in developing countries were closer to nature and they knew their environment well, compared to those in Western societies. As one teacher put it: "*...people in underdeveloped countries are brought up on the land and they get a great feeling of how it works...we get to know the land through education...*". At the same time the fact that teachers insisted that the developed countries' had the potential to deal with environmental problems, indicated a faith in the technological progress and prowess of these countries. Some 66.6% of the teachers who thought that developed countries were more environmentally literate than developing ones, claimed their society as being environmentally literate.

Finally, the English teachers considered the role of school to be very significant in creating future environmentally literate societies. However, they did not make any suggestions as to how these changes might occur and only 14% of the English teachers considered that the school should do more than it does now in terms of setting up policies for environmental education or spending more money on resources and training.

9.5 Key Conclusions.

The discussion of the findings led to key conclusions regarding English teachers' awareness of environmental education, their motivation to teach

environmental education and their general environmental awareness. These key conclusions are:

1. English teachers endorsed **education ABOUT and IN the environment** more than education FOR the environment as far as their practice of environmental education is concerned.
2. English teachers were mainly aware of and in contact with **national and local initiatives, organisations and publications for environmental education** than international ones.
3. English teachers have **not attended many pre- or in-service training courses** for environmental education.
4. English teachers have acquired their **environmental knowledge mostly from the media.**
5. English teachers can be said to be **positively inclined towards environmental education** something which emerged both from their practice and from their expressed beliefs in what constituted environmental education.
6. English teachers did not perceive **environmental education to be a separate subject** in the school curriculum.
7. English teachers needed **information** rather than teaching guidance on environmental issues.
8. English teachers held **anthropocentric views** towards the environment and **technocentric ideas** underpinned their views concerning the environmental literacy of today's world.

These were the key conclusions that have resulted from the discussion on the findings discerned from the English teachers' replies. These will be compared with the conclusions that will emerge from the discussion on the findings of the Greek teachers' replies. The comparison between the conclusions emerging from the English and Greek data will aim to investigate the similarities and differences between the teachers of these two countries.

10. Discussion of the Greek Findings and Key Conclusions.

10.1 Introduction.

As with the findings which emerged from the English data, the findings from the Greek data will also be discussed along with the response categories of the Greek teachers' replies. The chapter will follow an identical structure to that the discussion of the English findings chapter followed. Hence, this chapter will discuss Greek teachers' awareness of environmental education, their motivation to teach environmental education and, finally, Greek teachers' general environmental awareness. It will end with a set of key conclusions which emerged from the discussion.

10.2 Greek teachers' awareness of environmental education.

Greek teachers discussed environmental education in terms of transmitting knowledge ABOUT the environment. The knowledge that Greek teachers wanted to impart to their students was concerned mainly with knowledge about general environmental issues rather than knowledge about the local environment. Greek teachers deemed it important to teach their pupils about nature in general (e.g. trees, lakes, rivers, mountains, animals, plants), about protecting the environment, about cleanliness, about pollution and people's uncontrollable interventions, about forests and toxic rain, about rubbish, about transportation. Greek teachers seemed to believe that unless pupils had the necessary information on environmental issues, their attitudes towards the environment were not likely to change. Knowledge about the local environment was discussed only by a few teachers (9.5%). The fact that Greek teachers emphasised the teaching of general environmental issues more than the teaching of the local environment could be attributed to the school subject 'Study of the Environment' which deals mainly with general environmental issues, as it was discussed in chapter 4. Thus, one can argue that education ABOUT the environment seemed to prevail in Greek schools. Teachers' replies to two of the interview questions indicated such a stance. One question asked teachers to define environmental education and the other question asked teachers to describe its school curriculum content. Table 12 shows the percentage that education ABOUT the environment attained in the categories that describe knowledge ABOUT the environment. Knowledge ABOUT the environment is denoted, in both questions, by

the category of Local Environment, the category of General Environmental Issues and the category of Both local and distant environments.

Table 12. Greek teachers' focus on education ABOUT the environment.

Categories	Definition of E.E.	Content of E.E.
Local Environment	9.5%	30.9%
General Environmental Issues	54.8%	69%
Both Local and Distant Environments	9.5%	–

This table indicates Greek teachers' focus on education ABOUT the environment, and more specifically on education ABOUT general environmental issues. Education FOR the environment was mentioned by the Greek teachers in their replies to two these questions but the percentage attained in each question was low in comparison with the percentage expressing a belief in education ABOUT the environment.

As mentioned previously Greek teachers defined environmental education and discussed its school curriculum content in terms of transmitting knowledge ABOUT general environmental issues. Education ABOUT the environment and more specifically education about general environmental issues was again the focus that the Greek teachers had when they discussed the most significant aspect of environmental education. For the Greek teachers education ABOUT general environmental issues was the main factor that described environmental education. Table 13 describes the percentages that the Greek teachers attributed to education ABOUT the environment and to education FOR the environment in three questions. First question was concerned with a definition for environmental education, the second one was concerned with its school curriculum content and the third question was concerned with its most significant aspect. Education ABOUT the environment was denoted by three categories namely, Local Environment, General Environmental Issues and Both local and distant environments, while the category Develop a Positive Attitude denoted education FOR the environment.

Table 13. Greek teachers' perceptions of environmental education.

Categories	Definition of E.E.	Content of E.E.	Most significant aspect of E.E.
Local Environment	9.5%	30.9%	9.5%
General Environmental Issues	**54.8%**	**69%**	**59.5%**
Both local and distant environments	9.5%	–	–
Develop a Positive Attitude	26.2%	9.5%	21.4%

It is clear that there was a consistency in the Greek teachers' views as to what environmental education was all about and what it should entail. However, it is possible to argue that this consistency was not necessarily a positive thing since teachers used the same theme (that of general environmental issues) to define environmental education, to describe its school curriculum content and to discuss its most significant aspect. That is, three different questions of the interview, the ones that they were just mentioned, led to the creation of similar categories which also concentrated similar percentages. Education ABOUT the environment prevailed in the Greek teachers' thinking of environmental education over education FOR the environment.

Education IN the environment was highly endorsed by the Greek teachers (95.2%). Visiting places of beauty or places where disasters have occurred were mentioned as an effective way of presenting environmental knowledge to pupils. First-hand experiences were discussed more than the expository methods. Audio-visual material was prominent as well in the Greek teachers' replies. The Greek teachers perceived the teaching of environmental education as something vivid that needed to impress pupils and instigate their interest. One teacher mentioned: "*...by visiting places in order to get either positive or negative pictures of the environment.*". Text books did not appear to be the only way of transmitting

environmental knowledge to pupils. Thus, education ABOUT and IN the environment were discussed by the Greek teachers in greater percentages than education FOR the environment.

The Greek teachers viewed environmental education as something relatively new for school curricula and school life generally. Most of the Greek teachers (66.7%) claimed that environmental education has only recently been introduced in school curriculum within the last 10 years, 16.7% claimed that it did not exist in school curriculum at all and another 16.7% claimed that it has existed for a substantial time of ten years and more. None of the Greek teachers believed that environmental education had always been part of school curriculum. Environmental education appeared for the Greek teachers the recent years when environment has been given more attention in the world generally and more specifically in education with various documents and agencies. For instance, the Greek teachers claimed: "*...it must have been the last 6 or 7 years...in school curriculum there's no teaching hour for environmental education...whatever is happening, it is extra on the teaching schedule...*" or "*...the last 10 years we have started in schools spotting the environment in a different way. With the new books that were introduced...Before that lower classes had no book and higher classes had geography.*" or "*It never consisted part of the school curriculum. The last year there were...given some directions from the Ministry meaning that you can do environmental education in some of your teaching hours.*". Two very important matters that could have influenced Greek teachers' ideas regarding the appearance of environmental education in school curriculum concerned the introduction of a school subject called 'Study of the Environment' and the establishment of an Office responsible for environmental education for both primary and secondary education in every county. Ever since the introduction of these two factors (early '80s) teachers have started to perceive environmental education in schools. Teachers who claimed that environmental education did not exist in school curriculum (16.7%) believed that since there was no specific subject and time period in to school schedule, environmental education became optional. Because it is optional, however, it cannot constitute part of the school curriculum because some teachers may practice it and some others not.

Almost all the Greek teachers (97.6%) believed that environmental education was appropriate for all student ages. The Greek teachers did not think of students'

ages as a factor preventing them from teaching environmental education. They considered that all ages could be taught about the environment. Also, it seemed very important for Greek teachers to start teaching environmental education since an early age. One teacher in particular mentioned that: "*This kind of education should start from a moment that a person is born till the moment he/she will close their eyes.*".

As mentioned before the Greek teachers viewed environmental education as a new dimension in school curriculum. One of the factors that made them consider environmental education as such is the introduction of a school subject called 'Study of the Environment'. A separate time period is dedicated to that subject, hence a considerable percentage of Greek teachers (35.7%) thought that environmental education should be incorporated in school curriculum as a subject in its own right. Actually, the Greek teachers referred to that school subject claiming that it served purposes of environmental education but the time schedule was quite tight to teach it either more or better. Apart from the time constraints, the Greek teachers mentioned that having environmental education as a subject in its own right indicated its greater significance too. That is, pupils were to perceive better how important environmental education was since it constituted a separate subject. However, another 35.7% of Greek teachers considered that environmental education could easily be incorporated through other separate subjects. Teachers claimed that stimuli could be found in all school disciplines they taught. Having environmental education incorporated in other subjects would help pupils perceive better that: "...*everything consists a chain of knowledge*...". Lower percentages endorsed other ways of implementing environmental education in school curriculum such as topic work (2.4%) or combination of methods (19%) or general matters (7.1%). The Greek National Curriculum discussed environmental education as a dimension that teachers needed to consider in their teaching. Environmental education is not established in school curriculum as a separate subject in its own right. The fact that a considerable percentage of Greek teachers (35.7%) claimed that environmental education should be incorporated as separate subject can be attributed to the school subject 'Study of the Environment'. The Greek teachers already taught a school subject pertinent with an environmental education curriculum which they were required to teach. However, they felt that its importance was much greater to be left like that. On the other hand, the teachers who discussed the implementation of

environmental education through other separate subjects (35.7%) considered that the significance of environmental education would be better shown if: "*...the stimuli are given through the subjects...then children function more freely and more spontaneous, they are expressed in a more direct way, it comes out easier...in all subjects there are stimuli...*". Thus, an equal percentage of Greek teachers (35.7%) has perceived the incorporation of environmental education either as a separate subject or through other school disciplines. Teachers' choices can be attributed to the National Curriculum which on the one hand it included a school subject relative to an environmental education curriculum and on the other hand it asked teachers to consider environmental education as a dimension that can permeate their teaching generally.

The Greek teachers exhibited knowledge of environmental organisations and of local initiatives. Teachers were aware of international organisations such as Greenpeace and WWF and of national organisations such as Arktouros, the Interdisciplinary Institute for Environmental Research, the Club of Ecologists in Drama. Almost all teachers but one discussed Greenpeace in terms of what they heard on the news. Teachers claimed: "*...Greenpeace, TV, which sensitise people in general. They didn't affect us in school in any special way. Nevertheless, if we want to get hold of any material, they help us...*" or "*...there's Greenpeace, various environmental agencies...I hear about their activities...*" or "*...I know Greenpeace as a big organisation...*". The one Greek teacher who gave more details about Greenpeace, said that: "*...we are members of Greenpeace, my husband and I, they send at home the informative leaflets...about forests...animals that are endangered species, about factories...*". The Greek teachers discussed national organisations and agencies which helped them teach environmental education. Arktouros, the Interdisciplinary Institute for Environmental Research, the club of ecologists in Drama supported teachers either by providing them with material or by organising training seminars for environmental education. The Greek teachers also exhibited knowledge of local initiatives. The most prominent local initiative concerned the Office for Environmental Education which exists in every county both for primary and secondary education. Teachers said that: "*...the last 8 or 10 years, there is, both in primary and secondary education a person responsible for environmental education...*" or "*...when the Office for Environmental Education of our county organises some seminars then they give some principles of environmental*

education.". The Greek teachers were not aware of publications or conferences concerning environmental education. Only one teacher mentioned the Rio de Janeiro conference saying: "*...for the Rio de Janeiro, I'm aware of the Agenda that has been...published and has been introduced by many countries that were participating in the conference...it was about ways of action. Ways of action aiming at the improvement of the environment.*".

Greenpeace and WWF were also mentioned when teachers were asked to discuss whether they were in contact with environmental organisations that helped them practice environmental education. The teachers' replies to both these questions, one concerned with the awareness of environmental organisations, publications, conferences and local initiatives and the other with teachers' engagement with them overlapped. In the main, the Greek teachers in their responses to both questions, discussed the factors that directly concerned their practice of environmental education. Apart from the one teacher who mentioned the Rio de Janeiro conference and Agenda 21, everything else discussed by the Greek teachers had a national or a local character. In the question regarding teachers' contacts with environmental organisations, two teachers discussed in more details how they worked with Greenpeace. For instance, they claimed: "*When I needed some material from Greenpeace I came into contact with them...*" or "*...Greenpeace and WWF. I'm getting information on what their activities are through their campaigns and their leaflets which are concerned with the environment's protection. I contribute to their task financially. Their leaflets support my environmental knowledge but they don't give me teaching guidance.*". The Greek teachers also discussed various national and local organisations that they have worked with or have come in contact with which enabled them to carry out their environmental education programmes.

However, less than half of the Greek teachers (35.7%) said they were not aware of any environmental organisation and more than half of them (61.9%) said that they were not in contact with any environmental organisation. The percentage of teachers who discussed environmental organisations and local initiatives for environmental education was encouraging because it indicated the teachers' awareness of agencies which can promote teachers' practice of environmental education. The teachers involved in the study were not identified as teachers who provided an environmental education curriculum. Despite this, the Greek teachers were able to discuss the

existence of an Office responsible for Environmental Education in every county, and national environmental organisations which varied from museums to local ecological clubs. The Greek teachers did not discuss significant conferences such as the Stockholm one in 1972, the Tbilisi conference in 1975 or the Rio de Janeiro one in 1992 which defined environmental education and its aims. The fact that the Greek teachers mentioned matters which were of tangible benefit to them was positive, because it showed their interest in environmental education to find out what sort of things can help them deliver it effectively. Conversely, it indicated lack of general knowledge concerning the development of environmental education, as they were not aware of significant milestones in the history of environmental education. It is possible to argue that theoretical knowledge on environmental education should be acquired during the teachers' initial training. That was non-existent, though, as will be shown further in the chapter.

10.3 Greek teachers' motivation to teach environmental education.

The Greek teachers (73.8%) claimed that they taught environmental education. They endorsed this claim by mentioning instances of doing so either that school year the interview took place (52.4%) or from previous years and by discussing how they used their school's surroundings in teaching environmental education. When the Greek teachers said that they taught environmental education and they mentioned instances of doing so, they also discussed how they taught environmental education. Thus, teachers made clear that environmental education was not a separate subject in school curriculum and they taught it either through other subjects namely, physics, geography, language, religious education, 'Study of the Environment', or through environmental education programmes. Teachers claimed that this was not a systematic way of teaching environmental education and that they needed more time in order to teach it properly. They said that they 'stole' time from other subjects and that was not convenient either for them or for their pupils. Despite the hurdles that the Greek teachers mentioned though, the majority of them (73.8%) still taught environmental education. Teachers felt that if they had more time then they would practice environmental education more. The Greek teachers received stimuli to teach environmental education not only from the disciplines they already taught but from their surroundings as well. School premises have been mentioned by many teachers

when they discussed for instance how they taught issues of cleanliness by using the school yards.

The Greek teachers' contacts with environmental organisations were discussed earlier in the section 11.2 along with the question concerned with the teachers' knowledge of environmental organisations, publications and conferences that have determined the character of environmental education. Furthermore, though, it could be possible to compare teachers' replies to whether they taught environmental education and whether they were engaged with environmental organisations. The percentage of teachers who had claimed that they taught environmental education and they were in contact with environmental organisations were greater than the percentage of teachers who claimed that they did not teach environmental education and had no contacts with environmental organisations either as table 14 indicates.

Table 14. Greek teachers' contacts with environmental organisations.

Number of teachers	Being in contact with organisations	Not being in contact with organisations
From the total of teachers who taught E.E. (31)	29%	54.8%
From the total of teachers who did not teach E.E. (8)	_	100%

The percentage of Table 14 shows that teachers who claimed that they did not teach environmental education, they did not have contacts with environmental organisations either. It is important though that more than half (54.8%) of Greek teachers who claimed that they taught environmental education were not in contact with environmental organisations, while only 29% of them were as such. It seems that teachers' contacts with environmental organisations did not actually define teachers' choices to teach environmental education or not. Nevertheless, a moderate percentage (29%) of the teachers who claimed that they taught environmental education were in contact with environmental organisations that helped them practice environmental education.

Most of the Greek teachers (85.7%) suggested that was better working in collaboration with colleagues rather than on their own. The advantages of working in collaboration included: more ideas being heard, knowledge gaps could be covered, teaching becomes more effective. Hence, pupils would enjoy better results. The Greek teachers also mentioned that working in collaboration was better because: "*...we haven't been trained.*" or "*...I don't have any kind of speciality on environmental education and other people's views are useful.*" or "*...my education is not enough to plan a good programme...*". Hence, lack of knowledge was also a factor explaining teachers' choices on collaborating with their colleagues. The teachers (11.9%) who said that they did not have any particular preferences as to how they work, they mentioned that they could easily do both. They acknowledged the advantages that collaboration brings upon teaching, but at the same time they discussed that they have faith in themselves as well.

The Greek teachers discussed their competencies in environmental education referring to their needs as far as environmental education was concerned. Both information on environmental issues and teaching guidance concentrated the highest percentage (42.9%). When examined separately, information concentrated a greater percentage (31%) than teaching guidance (21.4%). The Greek teachers said that they had not any preparation for environmental education in universities and the in-service training courses they had attended were not many. Thus, the Greek teachers asked for more courses which would provide teachers with knowledge and with teaching guidance. The fact that teachers' gave a higher percentage to information (31%) than to teaching guidance (21.4%) indicates once more teachers' focus on education ABOUT the environment. Lack of environmental knowledge could prevent teachers from teaching environmental education. Lack of teaching guidance did not necessarily mean that teachers cannot practice environmental education. There was no Greek teacher to claim that they did not have any needs. Besides, when earlier on teachers' working preferences were discussed (in collaboration or on their own) one of the reasons explaining why most of the Greek teachers (85.7%) preferred working in collaboration presented lack of knowledge. This lack of knowledge was also endorsed here where teachers asked mainly for information and then for teaching guidance. Table 15 describes the Greek teachers' needs in environmental education based on the way they preferred working, that is either in collaboration or both in collaboration and on their own.

Table 15. Greek teachers' needs in environmental education.

Categories	Working in Collaboration	Working on their own
Need for information	33.3%	40%
Need for teaching guidance	25%	0
Need for both	41%	40%
No needs	–	–

Thus, both teachers who worked in collaboration and teachers who did not mind working either way needed both information and teaching guidance. However, the percentage that the need for information, only, had accrued was greater than the percentage that the need for teaching guidance on its own had accrued.

More than half of the Greek teachers (57.1%) claimed that they had attended in-service training courses for environmental education. The in-service training courses were about various issues. One type of in-service courses consisted of the presentation of environmental topics that teachers from various schools had planned and taught with their classes. Other courses were concerned with the delta of rivers, discussing the flora and fauna of the region, giving information about the water community and the land in the region whilst other courses were concerned with forests or with the sea-water. These in-service training courses were providing teachers not only with information but with teaching guidance as well. The Greek teachers said that: "*...there was information about the pack for the Brown Bear and how we can teach it in school...another seminar...had to do with the folkloric tradition. They gave us information on how we can teach in school the folkloric tradition...*" or "*...we had a two hour seminar...concerned exclusively with issues that we could teach...getting to know the environment...*". It is evident that many of the in-service training courses were about general environmental issues. Hence, it is not surprising that the Greek teachers endorsed the teaching of general environmental issues when they defined environmental education and when they discussed its school curriculum content. Their knowledge about environmental education must have been shaped to a greater or lesser extent by these in-service

training courses. It is striking that not even one Greek teacher had participated in initial training courses for environmental education, whilst 38.1% of them had attended neither pre- nor in-service training courses for environmental education. The teachers (38.1%) who claimed that they had not attended any training courses explained that they had not attended any due to constraints of time or place, or due to personal reasons such as not having an interest in environmental education.

Hence, in-service training courses for environmental education were what most of the Greek teachers had attended. Table 16 compares the percentage of teachers who said that they taught environmental education and they had or had not attended any training courses with the percentage of teachers who claimed that they did not teach environmental education.

Table 16. Frequency of course attendance by Greek teachers.

Number of teachers	Having attended in-service training courses.	Having attended pre-service training courses.	Not having attended anything.
From the total of teachers who claimed they taught E.E. (31)	54.8%	_	45.1%
From the total of teachers who did not teach E.E. (8)	50%	_	25%

It seems that Greek teachers' choices to teach environmental education or not were not necessarily defined by the training courses they had attended for environmental education. More than half of the Greek teachers (54.8%) who claimed that they taught environmental education had attended in-service training courses, while half of the Greek teachers (50%) who claimed that they did not teach environmental education had also attended in-service training courses.

The fact that training courses for environmental education have not influenced the Greek teachers' choices to teach environmental education or not was also indicated by the very small percentage (2.4%) of the Greek teachers which discussed their training as the only source of environmental knowledge. Media, instead,

concentrated a greater percentage (59.5%). The Greek teachers also discussed a combination of sources (26.2%) which included media along with training and teachers' personal experiences and love for nature. But again this percentage (26.2%) was still lower than the percentage that media (59.5%) reached.

Thus, it is reasonable to claim that the Greek teachers focused on education ABOUT the environment having a particular interest in education about general environmental issues. Their training has been providing them with knowledge pertinent to general environmental issues, hence it was not surprising their concentration on education ABOUT the environment. The Greek teachers' awareness of and contacts with environmental organisations and other pertinent agencies were limited to either well-known organisations like Greenpeace or to national and local agencies and initiatives. Neither teachers' training nor their contacts with environmental organisations seemed to make a big difference in teachers' choices to teach environmental education or not. That was also endorsed by the fact that only 2.4% of the Greek teachers attributed their environmental knowledge to their training, while most of them (59.5%) talked about media as their main source of environmental knowledge.

Environmental education was viewed as a new dimension which has been added recently because in recent years more intense worries about the environment have also risen. The Greek teachers referred to the difficulties they met in teaching environmental education (e.g. not firmly established in school curriculum), but still the percentage that show how many teachers practised environmental education and how they did that were encouraging. The discouraging feature stemmed from the very low percentage (2.4%) of the Greek teachers discussing their training as their main source of environmental knowledge. It became more discouraging when it was compared with the percentage of teachers who had attended in-service training courses (57.1%), which was pretty high.

Thus, one could argue that even though the Greek teachers were not well prepared to teach environmental education and even though they treated environmental education as something new and optional in school curriculum, they still claimed that they taught it. They were able to discuss both instances of practising environmental education and how they did it. Their lack in training was reinforced by the fact that none of the Greek teachers had attended pre-service training courses and that was one of the reasons explaining why they preferred

working in collaboration than on their own since they did not have the necessary knowledge that is required.

10.4 Greek teachers' general environmental awareness.

The majority of the Greek teachers (95.2%) discussed as significant environmental issues the damage that has been inflicted upon earth. That is, they referred to pollution, to car fumes, to the hole in the ozone layer, to forest fires, to the extinction of species, to waste, to the abuse of resources. The Greek teachers' perceptions of environmental issues indicated an anthropocentric way of thinking. They attributed the significance of these issues mainly to the consequences they bore upon people (64.2%). Then, a small percentage of 16.6% discussed consequences that could be inflicted on the planet. It is striking how Greek teachers considered mainly man's existence on planet in relation to important environmental issues. The media, which were shown earlier as the main source of environmental knowledge, were not discussed but by few teachers (9.5%) as influencing teachers' ideas regarding the significance of environmental issues.

The Greek teachers acquired their environmental knowledge from formal sources. Nevertheless, they considered that both formal and informal sources were important if someone wanted to acquire effective environmental knowledge (42.9%). A remarkable feature was that the percentage that formal and informal sources have concentrated separately (21.4% and 35.7% respectively) indicated teachers' preferences towards the informal sources. That is, the Greek teachers had to rely on media to acquire their knowledge but they valued informal sources (e.g. experiences in nature and in the outdoors) more. Even though their sources of environmental knowledge have been limited to media, the Greek teachers were able to perceive how other sources, closer to nature could help people acquire effective environmental knowledge. The teachers' discussion of informal sources complimented also their views on how to present environmental knowledge to pupils. The Greek teachers claimed that first-hand experiences were the best way to present environmental knowledge to pupils. Teachers acknowledged that informal sources, which included experiences in the outdoors, could lead to more effective environmental knowledge. It is striking that despite the fact that their knowledge has been shaped mostly by formal sources, namely media, they valued informal sources as much and even more than formal sources. The efficiency of formal sources only

to lead to effective environmental knowledge can be doubted by the fact that only 1 teacher (2.4%) discussed her training as the only source of environmental knowledge. Since more than half of the Greek teachers (57.1%) had attended in-service training courses for environmental education, one could expect higher percentages to be attributed to teachers' training as their main source of environmental knowledge.

The Greek teachers' technocentric attitudes can be detected by teachers' beliefs in developed countries' financial potentials. Even though most of the Greek teachers (71.4%) considered that the society we were living was not environmentally literate, 54.8% of them contemplated that developed countries were more environmentally literate than the developing countries. Teachers attributed developed countries' environmental superiority to education, to money, to the fact that they have created more environmental problems and so they have started finding solutions about them.

Finally, the Greek teachers perceived the role of school as very important in creating future environmentally literate societies but they have not made any particular suggestions for changes to occur. A small percentage of 21.4% thought that school should do more than it does now. Greek teachers actually asked once more for courses which would prepare teachers properly for environmental education.

10.5 Key Conclusions.

The above discussion of findings led to key conclusions regarding Greek teachers' awareness of environmental education, their motivation to teach it and their general environmental awareness. These conclusions are:

1. Greek teachers endorsed **education ABOUT and IN the environment** more than education FOR the environment.
2. Greek teachers were mostly aware of and in contact with **national and local initiatives, organisations and publications for environmental education** rather than international ones.
3. Greek teachers have **not attended many pre- and in-service training courses** for environmental education.
4. Greek teachers have acquired their **environmental knowledge mostly from media**.

5. Greek teachers were **positively inclined towards environmental education** emerging both from their practices and their beliefs for environmental education.
6. Greek teachers viewed **environmental education both as a separate subject and as part of other disciplines**.
7. Greek teachers needed **more information** rather than teaching guidance on environmental issues.
8. Greek teachers held **anthropocentric views** towards the environment and **technocentric** ideas underpinned their views explaining why developed countries were more environmentally literate than the developing ones.

Next these conclusions will be compared to the key conclusions that have emerged from the discussion on the findings of the English teachers' replies. Then they will be compared with results from previous studies in the past in the field of environmental education.

11. CONCLUSIONS OF THIS RESEARCH STUDY AND COMPARISONS WITH RESULTS OF PREVIOUSLY PUBLISHED RESEARCH.

This chapter will compare the key conclusions that emerged from the discussion chapters of the English and the Greek findings. The comparison of the key conclusions revealed both similarities and differences that existed in teachers' awareness of environmental education, in their motivation to teach environmental education and in their general environmental awareness in the two countries in which the research was conducted. The chapter then discusses how the results of the current study relate to results of previously published research. It will indicate how the results of the current study either endorse, contradict or complement the findings of other studies in the field of environmental education.

11.1 Differences and similarities between English and Greek teachers.

11.1.1 Similarities.

1. Education ABOUT and IN the environment were more widely included than education FOR the environment in both the English and the Greek teachers' practice of environmental education.
2. Neither the English nor the Greek teachers were able to discuss significant events which defined environmental education and its character. They were, however, able to discuss national and local environmental organisations, publications. Greenpeace, WWF and Friends of the Earth were the international organisations mentioned by the teachers. Also, those organisations with which teachers were mainly in contact with were local or national environmental agencies.
3. The English and the Greek teachers' training in environmental education was limited and teachers did not express their satisfaction with the pre- and in-service training courses they had attended.
4. The media constituted the teachers' main source of environmental knowledge.
5. Teachers were positively inclined towards environmental education because they indicated a motivation to teach environmental education.

6. Teachers seemed to lack knowledge about environmental education more than they lacked teaching guidance.
7. Teachers perceived the environment in an anthropocentric way, and technocentric ideas underpinned their views regarding the world's environmental literacy.
8. Teachers viewed the role of school as very important in creating future environmentally literate societies.

11.1.2 Differences.

1. Both the English and the Greek teachers emphasised the element of environmental education which was ABOUT the environment. However, the English teachers tended to emphasise discussion about the local environment, while the Greek teachers tended to emphasise discussion about general environmental issues.
2. The English teachers perceived education FOR the environment as the ultimate goal of environmental education, while the Greek teachers emphasised again education ABOUT the environment.
3. The English and the Greek teachers had a different perception about the length of time environmental education had existed in the school curriculum of their country.
4. The English and the Greek teachers also had different opinions about how environmental education might be incorporated into the school curriculum. The English teachers suggested it should be taught through topic-work without having it as a separate subject. The Greek teachers on the other hand, thought that environmental education could be best incorporated into the school curriculum either as a separate subject or as part of other disciplines.

11.2 Comparison of the Key Conclusions.

The comparison of the key conclusions leads one to the conclusion that there are more similarities than differences, as demonstrated above, between the English and the Greek primary school teachers.

11.2.1 Similarities.

The first similarity emerging from the data indicated that teachers endorsed education ABOUT and IN the environment more than they did education FOR the environment in their practice. The English and the Greek teachers focused their teaching primarily on transmitting knowledge about the environment. The fact that both the English and the Greek teachers endorsed education ABOUT and IN the environment more than they endorsed education FOR the environment in their practice was not surprising. Education ABOUT and IN the environment have been identified as the most prominent feature of school practice of environmental education by previous research studies as well (Spork 1992, etc.). In this current research study the curricula of both countries seem to promote mainly education ABOUT and IN the environment. The English Curriculum for instance encourages teachers to study localities and their flora and fauna, while the Greek curriculum includes a school subject which embraces environmental education content through the examination of both local and general environmental issues. Besides, education FOR the environment entailed a greater planning effort from teachers in order to effectively deliver it because it dealt mainly with values. Instead, education ABOUT and IN the environment offered more connections to teachers' daily practice and, additionally knowledge on environmental issues could easily be found in school's curricula as well. It should be noted however, that there were two differences observed between the English and the Greek teachers' views on educating ABOUT, IN and FOR the environment which will be presented later in the differences.

The second similarity emerging from the data related to the teachers' awareness of significant events in the history of environmental education. Neither the English nor the Greek teachers were aware of significant conferences and events that have determined the character of environmental education. Teachers were not able to discuss conferences and publications that have played an important role in the history of environmental education such as the Stockholm conference of 1972 or Tbilisi of 1975 and the Rio de Janeiro conference in 1992. Only one English and one Greek teacher mentioned *Agenda 21* (IUCN, 1992). The English teacher said that she was only aware of the fact that Newcastle had Local Agenda 21 but she knew nothing else about it. The Greek teacher mentioned that Agenda 21 was produced at the Rio de Janeiro conference and that it was concerned with protective measures for the environment agreed upon by the participant countries. Both the English and the

Greek teachers were aware of organisations, of publications and of initiatives that were either local, national or international ones. Greenpeace, WWF and Friends of the Earth were the three big NGOs that teachers referred to and they were identified as the best known NGOs among English and Greek teachers. This could be due to the exposure they have received through the media. The NGOs' role in the dissemination of environmental education is unquestionably crucial. However, events such as the Stockholm Conference in 1972 or the *World Conservation Strategy* (IUCN, 1980), or *Agenda 21* (IUCN, 1992) have had also enormous influence on environmental education. Teachers were not aware of such events and publications probably because their training was insufficient. Training in environmental education should not exclusively mean the acquisition of knowledge about environmental issues and teaching strategies, it should also entail knowledge of the history, background and development of environmental education. Such knowledge was virtually absent from the sample in the current study. One explanation for this could be the lack of teacher training courses. Another reason could be that these particular teachers seemed to lack a personal interest in environmental education which, had it been there, might have resulted in an investigation of environmental education.

A third similarity was in relation to teachers' training in environmental education. Teacher training seemed to be neither satisfying nor sufficient. The percentage of both the English and the Greek teachers who have attended training courses for environmental education ranged from low to moderate or non-existent. For instance, none of the Greek teachers had attended any pre-service training courses, while the percentage of the English teachers that had done so was low (9.3%). More than half of the Greek teachers (57.1%) had attended in-service training courses, while substantially less of the English teachers had done so (18.6%). The number of in-service training courses mentioned by the Greek teachers could be attributed to the Office for Environmental Education that exists in every county and which has responsibility for both primary and secondary education. Many of the in-service courses that teachers referred to were organised by that Office. One common type of in-service training course organised by the Office presented environmental education programmes that have been worked on by various teachers and their pupils in different schools. Hence, teachers had the opportunity to see how other teachers dealt with environmental education and a

network of schools providing environmental education was created. Nevertheless, one could argue that this was not enough because it seems that environmental education is still struggling to find its position in teachers' pre- and in-service training. Lack of initial training for these particular teachers can be attributed to the fact that when they were studying for their degrees (during the 1960s and 1970s) environmental education had just started to take shape. Hence, the absence of environmental education from universities and colleges of education that period can be accounted for. Conversely, recent increased interest in the environment in general and in environmental education in particular could account for the greater number of in-service courses attended.

The influence of the media upon teachers was the fourth similarity between the English and the Greek teachers. The media constituted the major source of environmental knowledge for both the English and the Greek teachers. Much lower percentage of teachers (11.9% and 9.3% for Greek and English teachers respectively) referred to their own experiences in nature as sources of environmental knowledge and even lower percentage (2.4% and 7% for Greek and English teachers respectively) acknowledged their training as the major source of their environmental knowledge. Such findings cast doubts on the effectiveness of initial and in-service training courses that teachers had attended. It is striking how teachers did not discuss their training as a main source of environmental knowledge.

A fifth similarity was in respect to both the English and the Greek teachers' positive inclination towards environmental education. The majority of teachers from both countries claimed that they taught environmental education, that pupils' ages did not prevent them from doing so, that they used their school's surroundings and that they received stimuli from all the different disciplines that they taught. Even though teachers' training in environmental education was insufficient, still teachers seemed to consider environmental education in their teaching. This could be attributed to the fact that teachers in both England and Greece were aware of significant environmental issues and of their possible consequences for humanity. It can be argued that their motivation to teach environmental education stemmed from what they perceived as an urgent need to safeguard the world we live in. Hence, one could argue that teachers have not become aware of the importance of environmental education to the degree they have become aware of the dangers that

threaten the earth. That is another element that endorsed teachers' anthropocentric views about the environment.

Both the English and the Greek teachers' expressed need for information and teaching guidance on environmental issues constituted the sixth similarity. Information, though, was felt to be more of a need than teaching guidance. This can be attributed to the lack of initial and in-service training courses that teachers had already stated. Teachers' preparation for environmental education in both countries could hardly be described as ideal, quite the contrary. It was to be expected therefore that teachers were concerned with their lack of knowledge. Teaching guidance should also be provided by the training courses, though lack of teaching guidance did not seem to create the same problems when teachers came to teach environmental education. A general belief that the teachers of this study seemed to have acquired was that as long as they had the appropriate knowledge, then teaching methodology could be worked out. This was because teachers in the primary sector are already expected to teach various subjects. Thus, since they were aware of general teaching strategies they felt they could adopt them to all the different subjects and topics which they have responsibility for teaching.

A seventh similarity was in respect to both the English and the Greek teachers' anthropocentric views towards the environment. Humans and the consequences that they suffer from environmental degradation were identified by teachers (28.2% of English teachers and 64.9% of Greek teachers) as reasons which explained the significance of environmental issues. The Greek teachers seemed to support that more than the English teachers. However another 28.2% of the English teachers attributed the significance of environmental issues on the publicity they gained from the media. Teachers defined also the society we lived in as one that was not environmentally literate, though developed countries were seen as more environmentally literate than developing ones. Teachers believed that economic growth and technological advancement could solve environmental problems, and that is why they considered the developed countries to be more environmentally literate than the developing ones. Teachers' anthropocentric views can be attributed to the media. The media constituted their major source of knowledge. It is clear that as the media tends to present articles or programmes that deal mainly with environmental disasters or debates on issues that arise from various environmental incidents, then people will inevitably perceive environmental issues as something

based on human needs and concerns. Thus, one could argue that teachers, being part of such a society have also acquired anthropocentric views. England and Greece are two countries with differences as far as economic and industrial developments are concerned. However, the teachers that were interviewed for this study have shown similar anthropocentric views and the same technocentric ideas as far as the solution of environmental problems were concerned. Ecocentric ideas and the belief in the inherent value of nature did not appear at all when teachers discussed all the above.

Finally, an eighth similarity was in reference to the way that that both the English and the Greek teachers contemplated the role of the school as very important in creating future environmentally literate societies. However, they did not make any particular suggestions as to how schools could accomplish this task in the best possible way. It seemed that in the same way school develops people's literacy, it should not be any different for environmental literacy. Teachers' lack of knowledge about the development of environmental education and about environmental education practice seemed to prevent them from discussing ways of enforcing the school's role in creating future environmentally literate societies.

11.2.2. Differences.

The first difference was in respect to the kind of environmental knowledge that English and Greek teachers aimed to impart. The English teachers discussed mostly imparting knowledge about the local environment, while the Greek teachers discussed mainly imparting knowledge about general environmental issues. A reason which may explain this difference could be attributed to a school subject, namely 'Study of the Environment', that exists in the Greek primary school curriculum which its content is pertinent to an environmental education curriculum. That school subject, as it has already been described in chapter 4, along with the environmental education programmes that Greek teachers undertook, dealt with the local environment as well as with general environmental issues. General issues, though, seemed to prevail in Greek teachers' thought of what constituted environmental education. This was further exhibited by the fact that the in-service training courses that Greek teachers had attended and discussed with the researcher were concerned with general environmental issues. On the other hand, the English National Curriculum did not include any particular school subject pertinent to an

environmental education content. Moreover, it encouraged teachers to teach about pupils' locality and other localities that were close to their region.

The second difference was in reference to teachers' approaches towards the three-fold framework (FOR, ABOUT and IN/THROUGH of environmental education.). This had to do with their views about education FOR the environment. Even though both the English and the Greek teachers endorsed education ABOUT and IN the environment as far as practising and defining environmental education, the English teachers discussed education FOR the environment as the ultimate goal of environmental education. They did not include education FOR the environment as much when they discussed either a definition for environmental education or its school curriculum content. However, they emphasised education FOR the environment as the most significant aspect of environmental education when they were asked to discuss what they considered to be the most important aspect in environmental education. The Greek teachers emphasised again education ABOUT the environment as the most significant aspect of environmental education. One could argue that the Greek teachers have been influenced by the school curriculum of their country to a greater extent than the English teachers have by theirs. It could be that the Greek curriculum placed more emphasis on education ABOUT the environment, particularly as the Greek curriculum already includes a subject with content pertinent to environmental education. Consequently, the Greek teachers may perceive that knowledge ABOUT the environment has greater importance than education FOR the environment since there is already in existence a separate subject dealing with exactly that. The school curriculum in both countries has been identified as promoting education ABOUT the environment. Chapter 4 has shown that. However, the English teachers disentangled themselves from this popular dimension of environmental education when they were asked to discuss what they believed to be the most significant aspect of environmental education that pupils should be taught. The Greek teachers on the other hand seemed to have become more emerged in their practice of environmental education which concentrated on education ABOUT the environment. It could be possible to assume that even though the National Curriculum of both countries tried to achieve a holistic development for pupils (e.g. moral, spiritual, aesthetic development) the Greek teachers, unlike their English colleagues, limited the scope of the school curriculum to the transmission of knowledge. However, it should also be noted that both the Greek and the English

teachers promoted education ABOUT the environment in their actual practices. Hence, this difference between the Greek and the English teachers lies mostly with teachers' perceptions about the significance of environmental education and it did not seem to have any influence upon their practices.

A third difference between the English and the Greek teachers was in respect to their views on the length of time environmental education has been a part of the school curriculum. The English teachers thought environmental education had been an ever-present element of the school curriculum, while the Greek teachers saw it as something relatively new in the school curriculum. An explanation for this difference could be attributed, again, to the introduction of the relatively new school subject in the Greek curriculum entitled 'Study of the Environment' and the establishment of an Office for Environmental Education in every county in Greece in the early 1980s. These two factors seemed to have influenced the Greek teachers' views as to how long they thought environmental education had existed in the school curriculum. The English teachers, however, thought that the National Curriculum, which was introduced in 1988, just applied a structure to what was already established in the curriculum.

Finally, the fourth difference concerned the English and the Greek teachers' awareness of how they thought environmental education should be incorporated into the school curriculum. The English teachers claimed that environmental education should not become a part of the school curriculum as a subject in its own right. They considered that the best way to implement environmental education was through topic-work. The Greek teachers on the other hand, thought that environmental education should be either a separate subject or part of other disciplines. Again, the school curricula of both countries can account for this difference. That is, the English primary school teachers worked mainly through topics, and so environmental education should not be treated any differently. In the Greek school curriculum there was already one subject close to environmental education, hence one could argue that the Greek teachers considered it to be advantageous to environmental education if it was implemented as a separate subject. It seems that both the English and the Greek teachers' perception of how environmental education could be best implemented in the school curriculum was influenced by the curriculum which already existed in their own countries.

Summarising all the above section, one could conclude that the factors which can account for most of the similarities and differences between the Greek and the English teachers were the content of the school curricula of both countries along with the teachers' lack of initial and in-service training courses and the influence of the media upon the teachers. At this point it is helpful to set this discussion in the context of national developments and policy in England and Greece as detailed and discussed in chapter 4.

The curricula of both countries express ideas about environmental education that have been produced at conferences such as those in Tbilisi in 1977 and Belgrade in 1975. The threefold interpretation of education ABOUT, IN/THROUGH and FOR the environment is incorporated in the English national curriculum in a very straightforward way, while the Greek curriculum mentions that projects should be examined from a variety of perspectives. The Greek school curriculum does not make clear this threefold distinction. Environmental education is presented as an holistic procedure which aims to view issues from various aspects. It could be considered that this is a rather vague way of incorporating environmental education in the school curriculum. The findings of the current research reflected this position. The Greek teachers discussed mainly education ABOUT and IN the environment, while the English teachers also included education FOR the environment. It seems that it is not very clear what it means to examine an issue from all different perspectives. Most probably the Greek teachers interpreted 'all different perspectives' as using all the different school subjects. This interpretation exhibits the multi-disciplinary character of environmental education but it does not necessarily cover the three aspects of education, namely education ABOUT, IN/THROUGH and FOR the environment, which reflects rather its inter-disciplinary character. The English teachers included the dimension FOR environmental education in their discussion relating to what constituted the most significant aspect of environmental education and not in their discussion about how they practised environmental education. The holistic character of environmental education in the English national curriculum is better shown in the revised curriculum of 1995, where environmental education is no longer a cross-curricular theme but is referred to in all the school subjects. As from 1995 it became better integrated in to the national curriculum because it constituted part of the different school subjects.

Geography and science, though, have remained predominantly the core subjects that are mostly related to environmental education and primarily incorporate it.

Hence, the school curricula of both countries reflect the ideas that have been defined at the international conferences and workshops. The Greek curriculum does reflect the threefold of education ABOUT, IN/THROUGH and FOR the environment, albeit in a rather vague way, while the English curriculum does it more clearly. This could explain why Greek teachers did not discuss education FOR the environment as much as their English colleagues did. The fact that education ABOUT the environment has prevailed in the answers of most Greek and English teachers can be attributed to the structure of the school curriculum of both countries. The English one refers to what teachers can teach in every subject, having a strong focus on the cognitive aspect. The Greek curriculum, while it does not do that, includes a school subject which contains environmental issues and is offered in special time slots in the school schedule. The Greek national curriculum fails to promote with success the integrated character of environmental education because on the one hand it encourages environmental education programmes, carried out during additional school hours, and on the other hand it offers a school subject with a particular environmental education content. The English national curriculum stresses that environmental education should permeate the whole of the national curriculum but it clearly locates it primarily within geography and science. Both the English and the Greek national curricula refer to the multi-disciplinary character of environmental education but they fail to show its inter-disciplinary character. The inter-disciplinary character of environmental education is significant because it makes clear the interconnectedness among man, nature and our surroundings. One of the findings of the current study showed that both the English and the Greek teachers exhibited anthropocentric rather than ecocentric approaches to environmental education. Teachers referred in the main to humans when they discussed environmental issues and their significance. This fact could be attributed to the way that the national curricula of both countries have dealt with environmental knowledge, which was in a fragmented way rather than in an inter-disciplinary manner. Even the English teachers who included in their discussion education FOR the environment, they tended to describe situations where it was education mostly for better human conditions rather than for the environment as a whole.

What appears to be lacking from both countries' school curricula are links among the threefold distinction of environmental education as education ABOUT, IN/THROUGH and FOR the environment. The structure and the content of the school curriculum in both countries promote education ABOUT the environment. Teachers' practices were mostly concentrated on education ABOUT the environment. The influence of the media upon teachers and the in-service training programmes they had attended have also contributed to teachers' focus on education ABOUT the environment. Hence, if teachers are to be aware of the threefold distinction and if they are to practice environmental education accordingly, then both the school curriculum and the in-service training programmes need to be clearly based on this threefold distinction and appropriate links within this.

The English national curriculum can be characterised as more prescriptive than its Greek counterpart. This can be concluded from the fact that the English teachers referred to the school curriculum much more frequently than the Greek teachers did. For instance, one of the English teachers said that they had to teach environmental education because it was part of the statutory curriculum. The Greek teachers made no such reference. They equated environmental education with taking up environmental education programmes, which were optional, and with teaching the school subject 'Study of the Environment'. The findings of the current study showed that almost all the English and all the Greek teachers admitted teaching environmental education. The English teachers discussed mainly what was comprised in the curriculum, while the Greek teachers discussed various environmental topics which were either included in the curriculum or not. The Greek curriculum give teachers the opportunity to work on various environmental topics which derived from teachers' and pupils' interests. Teachers are free to plan these programmes according to their classes' needs and desires. However, the time schedule is very tight and even though free periods are given to teachers to work on such programmes, few teachers decide to take them up. Probably, it would be more helpful for Greek teachers to have the school subject 'Study of the Environment' as a guide to environmental education programmes rather than as a separate subject. Those responsible for environmental education in a county, along with the Centres of Environmental Education could work together and make suggestions to teachers for environmental activities. The results of the current study showed that many Greek teachers were aware of the person responsible for environmental education

but hardly any of them discussed the Centres of Environmental Education and their role in school life. Perhaps these Centres have not been advertised enough for teachers to know them. A similar finding derived from the English teachers' replies. That is, the Field Study Centres and their role in school life were not discussed by the English teachers. These centres and their role in environmental education were not mentioned in the national curriculum of either country. Existing publications and circulars that were sent to schools with information on these centres appeared to be ineffective as they reached only the teachers who were already interested in them. If the national curriculum gave guidelines, within specific parts of the curriculum, on the availability and use of these centres, surely more teachers would have been aware of their existence and their potential contribution to environmental education.

Another point that can be made relating to the national curriculum of both countries is that they do not seem to encourage schools to develop policies for environmental education. In one publication of the School Curriculum and Assessment Authority (SCAA, 1996) it was mentioned that such a policy can help significantly in the development of environmental education in schools. Nevertheless, the teachers of the current study, both the English and the Greek ones, did not discuss such policies.

Sustainability and education for sustainable development were hardly mentioned in the national curricula of England and Greece. The actual words 'sustainable development' are referred to in an English publication by the School Curriculum and Assessment Authority (SCAA, 1996) where it is mentioned that sustainable development can affect environmental planning and assessment. Also, another publication of the Department for Education and Employment (DfEE, 1999) discusses education for sustainable development and defines its characteristics. In the Greek national curriculum the description of environmental education included the interdependence among man, culture and his biophysical environment and it mentioned that people should learn to satisfy their own needs without compromising the needs of future generations. This constitutes part of a widely accepted definition for sustainable development. However, the actual words 'sustainable development' are not mentioned in the curriculum.

Now all the conclusions drawn so far will be compared with conclusions from other studies in the field of environmental education which have been included in the chapter 5. Thus, the next section of this chapter will relate the results of the

current study with the results of previous studies trying to endorse or to contradict previous results in the field of environmental education.

11.3 Relationship of key conclusions of current study to previously published research.

The first key conclusion of the current study shows that education ABOUT and IN the environment was more widely included than education FOR the environment in the English and the Greek teachers' practice of environmental education. One research study that arrived at similar results was that of Ham and Sewing (1987/88, USA). Their study using elementary school teachers aimed, among other things, to investigate what were teachers' definitions of environmental education. Their results indicated that education ABOUT the environment was a prominent feature in their sample's replies. For instance, 42.7% of the teachers claimed that environmental education was concerned with the teaching of and the raising of awareness of contents of the environment, 34.8% thought that environmental education was to teach pupils how to use resources wisely, 33.7% said that environmental education was concerned with the interactions and interdependencies in the environment, whilst helping young people to come to an appreciation of the environment and tackling problem-solving projects had lower percentages -16.9% and 9% respectively. Both the English and the Greek teachers of the current study and the teachers from the Ham and Sewing (1987/88) study favoured education ABOUT the environment in their practice.

Another study which also indicated teachers' preference in education ABOUT the environment was that of Dorion and Gayford (1990/91, England). One of the aims of this study was to examine how primary school teachers perceived environmental education. This study included a sample group of teachers identified as being committed to environmental education. The research results indicated that a high percentage of teachers, some 90% considered it important to involve children in the conservation and improvement of their local surroundings and they touched upon issues such as identification of plants (90%) or exploration of the surroundings (78%) or walks in the local area (73%) as ways of achieving this. A majority of teachers (68%) undertook action-based projects, but few of these projects involved decision-making. Again in this study as with the current one, local environment

seemed to be an eminent feature of education ABOUT the environment among English teachers.

Spork's study (1992, Australia) showed that education ABOUT and IN the environment were included in teachers' classroom programmes to a much greater extent than education FOR the environment. Ballantyne (1995, Australia) conducted a study aimed at investigating the impact of teaching/learning experiences during an environmental education teacher training programme. Before the course, Ballantyne asked his sample (both primary and secondary school teachers) to discuss the term environmental education. The majority of his sample thought of environmental education in terms of transmitting information about the environment. After the course had been completed, the majority of his sample thought of environmental education in terms of teaching environmental attitudes and behaviour. In a similar mode, a study conducted by Papadimitriou (1995, Greece) showed that teachers' ideas about environmental education were concentrated on transmitting knowledge about the environment, but as soon as their training was completed, teachers realised that environmental education was more than knowledge transmission. It became evident that education ABOUT the environment was the dimension of environmental education that sprang first to teachers' minds. A possible explanation could be the fact that teachers and the school system they worked in, promoted mainly knowledge transmission for all the different subjects taught. Hence, this was the simplest and fastest thing teachers could do, that is teach pupils about something.

In addition to these general findings, the current study has concluded more specifically that English teachers embraced education about the local environment, while Greek teachers endorsed education about general environmental issues. The previous studies referred to above showed that teachers favoured education about the environment in their environmental education work. One study (Dorion and Gayford, 1990/91) indicated that its sample (primary school teachers) discussed education about the environment in terms of the local area. For instance, teachers mentioned exploration of their local surroundings or walks in the local area. The other studies (Ham and Sewing 1987/88, Spork 1992, Ballantyne 1995, Papadimitriou 1995) did not make any particular reference to the local environment. The current study has attributed its English sample's emphasis of the local environment to the National Curriculum, something reinforced by the fact that the study of Dorion and Gayford (1990/91) which also referred to the local

environment, also took place in England. Another study that took place in England, that of Agyeman (1998) likewise reported that primary school teachers used the school nature garden in combination with the local park, the local woods or the local nature reserve to practice environmental education.

However, there was one study which indicated that education ABOUT and FOR the environment were equally endorsed by teachers. It was a study conducted by Gayford and Dillon (1993/94, England) comprising secondary school teachers who were involved in environmental education. All the teachers said that in their teaching there was a balance between the knowledge and understanding of environmental matters and the values and attitudes they taught.

As far as education IN the environment was concerned there are a number of studies which indicate either teachers' endorsement of it or teachers' other preferences of teaching environmental education. Mirka (1973, USA) examined reasons why teachers used or did not use the outdoors in their teaching. His study's results showed that teachers who shared similar characteristics such as age, suburban home background, bachelors' and masters' degrees, used the same reasons to justify their choice of using or not using the outdoors in their teachings. For instance, the availability of the outdoors was mentioned as a very significant reason why teachers did or did not use it in their teachings. The current study did not investigate reasons as such, but it did exhibit teachers' ideas concerning the best way to present environmental knowledge to their pupils. The majority of both the English and the Greek teachers mentioned that environmental knowledge needed to be vivid for pupils with organised visits outside the school premises and with first-hand experiences.

Another study, that of McCaw's (1979, USA) showed that study trips were more popular among elementary school teachers, with 72% of them preferring to visit indoor sites. The current study's sample discussed mainly visits to various locations either outdoors or indoors. However, the current study did not prompt any questions concerning advantages and disadvantages for using outdoor and indoor sites.

Another study concerned with teachers' ways of presenting environmental knowledge to pupils was that of Schwaab (1982/83, USA). He indicated that teacher-led discussions and the lecture method were mostly used, while the inquiry method was considered the most effective one. Teachers of the current study

discussed mainly first-hand experiences with very few teachers mentioning teacher-led discussions.

In 1993 Simmons (USA) investigated teachers' perceptions of the opportunities presented for environmental education when using natural areas. The results of her study indicated that 83% of the topics that teachers discussed were related with either recreational activities or they involved tree/plant identification. Only 3% of the topics involved an investigation of human impact on an area and just 2% of them involved some sort of ecosystem study. Teachers of the current study discussed visits to various places where pupils could see at first-hand both positive and negative pictures of the environment. They did not mention topics they could teach in these places, they just discussed how visiting various places could help pupils acquire better environmental knowledge.

In Papadimitriou's study (1995, Greece) teachers said that they practised environmental education both by using discussion and through visits to different places. In Yeung's study (1996, Hong-Kong) which examined the teaching of environmental issues within geography, teachers used such methods as notes on the blackboard, exposition and simple questioning. A further study, that of Robertson and Krugky-Smolska (1997, Canada) indicated that the three teachers interviewed, who were committed to environmental education, advocated the importance of the experiential approach, of research and of the action component in environmental education. They aimed to engage pupils in research so they might reach knowledge of various issues on their own. Finally, Balantyne's study (1999, Australia) showed that teachers used various methods in teaching environmental education through geography, which were expository methods (e.g. teacher presentations, class discussions, videos, worksheets).

The second key conclusion of the current study shows that teachers from both countries were not aware of significant events which have determined the character of environmental education. Furthermore, teachers were in contact mostly with national or local environmental organisations. The literature review did not include many findings pertinent to that conclusion. The study of Schwaab (1982/83, USA) indicated that teachers searched for sources from state and environmental organisations rather than from local agencies or industry. The current study has indicated that local and national organisations, their publications and initiatives are more popular among English and Greek teachers rather than international ones. Also

another study, that of Gayford and Dillon (1993/94, England) indicated that all teachers included in the study had some contact with non-governmental organisations -mostly the large ones- whilst only 29% had connections with people from their local community or people working in local government. Also, all respondents had heard of UNCED but few had heard of Agenda 21. The current study indicated that only two teachers were aware of Agenda 21, one English and one Greek. These teachers mentioned Agenda 21 but they were not able to discuss it any further. The English teacher was only aware of the fact that Newcastle had an Agenda 21 programme, whilst the Greek teacher mentioned that Agenda 21 was produced at the Rio de Janeiro conference in 1992 by the participant countries and it was concerned with measures aimed at protecting the environment. The current study endorsed the finding of Gayford and Dillon (1993/94, England) concerning teachers' limited knowledge of events like the Rio de Janeiro Conference and Agenda 21. However, the current study also concluded that teachers were more interested in national and local agencies and initiatives for environmental education, while the studies of Schwaab (1982/83, USA) and of Gayford and Dillon (1993/94, England) showed that teachers had contacts with large non-governmental organisations rather than local ones.

The third key conclusion of the current study is that the teachers' training in environmental education was limited. The literature review included research studies which attempted to show that pre- and in-service training courses were useful for teachers. Such were the studies of Jaus (1978, USA) which concluded that the group of teachers who received training in environmental education had more positive attitudes towards teaching environmental education in their classroom than the teachers who did not receive this training. Other such studies were those of Lane, Wilke, Champeau and Sivek (1992 and in 1995, USA). Their first study showed that teachers who had received preparation in environmental education (pre-service courses) had a positive perception of their competencies and of the amount of time they devoted to environmental education in their classrooms compared with those teachers who had not undertaken any pre-service courses in environmental education. Their second study (1995, USA) indicated that both pre- and in-service preparation in environmental education was effective and had positive consequences on teachers' perceived competencies in environmental education. Their study revealed also that affective education methods and environmental action strategies

needed to be worked on more in teachers' initial training in environmental education. Other research projects recorded the percentage of teachers who had actually attended either pre- or in-service training courses. Spork's study (1992, Australia) endorsed the current study's results, as its percentage showed that 85.8% of the teachers had never received any training in environmental education, only 4.9% had received in-service training and just 3.1% had undertaken college or university post-graduate studies in environmental education. Gayford and Dillon's study (1993/94, England) also showed similar results. Their study revealed that only 12% of teachers had received professional training which might help them deal with values and attitudes in environmental education. Ballantyne's study (1999, Australia) showed that 61% of its sample thought that their pre-service training had not prepared them well for teaching environmental education. On a more positive note were the research studies of Dorion and Gayford (1990/91, England), which showed that 86% had attended in-service training courses in the last five years and 96% acknowledged a need for in-service training dealing with ways of incorporating environmental education into their practice. Another study by Ballantyne (1995, Australia) showed that the design of a particular course had helped students to think of other forms of environmental education as well as to reinforce the beliefs they already held for environmental concerns. Similar results appeared in the study of Papadimitriou (1995, Greece). In her study, Papadimitriou showed that the teachers' views changed as they realised that environmental education was not only about knowledge transmission but also about action. The current study did not attempt to assess the efficiency of the training courses that teachers had attended. It tried to investigate whether teachers had any training, what its content was, and how it had influenced teachers' ideas on environmental education. The results showed that training in environmental education was not greatly infused in teachers' preparation. At the same time, the fact that teachers did not identify their training as their main source of environmental knowledge led, indirectly, to the assumption that teachers were not satisfied with the training they did take part in.

The fourth key conclusion of the current research shows that the media has been identified as the teachers' major source of environmental knowledge. That is, both the English and the Greek teachers referred mainly to the media as the source of their environmental knowledge rather than attributing this mainly to their training. Admittedly, training in environmental education was not greatly infused in their

initial training. However, the number of teachers who claimed their training as their main source of environmental knowledge was very low. The literature review included studies which have tried in the past to investigate sources which have influenced people's environmental knowledge. Palmer et al (1996, 1998, UK and Greece) concluded that experiences in the outdoors, education and parents/close relatives have influenced environmental educators' knowledge and interest in environmental education. The media also appeared in this study as one of the influential factors, but it was certainly not the first and the main source of people's environmental knowledge as the current study has concluded.

Ballantyne (1999, Australia) on the other hand, showed that teachers' personal reading and videos/films were more likely to have contributed to respondents' knowledge and skills in environmental education, while the least likely were in-service training course and curriculum guides. Personal reading could include all sorts of literature such as books, magazines, newspapers. Thus, the results of the current study seem to concur with the findings of Ballantyne's (1999) study rather than with Palmer's (1996,1998) study. Of course, it is necessary to mention that Palmer's sample was comprised of environmental educators, while both Ballantyne's study and the current one comprised teachers whose commitment to environmental education could not be taken for granted.

The fifth key conclusion of the current study reports that both the English and the Greek teachers are positively inclined towards environmental education. Such a conclusion emerged from the teachers' motivation to teach environmental education. The current study shows that high percentage of the English and the Greek teachers claimed that they taught environmental education (90.7% and 73.8% respectively). In Ham and Sewing (1987/88, USA) almost half of the sample (42.6%) replied that they taught environmental education "now and then". The sample of the current study appeared to be more assertive of their practice of environmental education.

Spork's study (1992, Australia) showed that teachers considered environmental education as the second most important learning area after human relationships, while most teachers regarded all forms of environmental education either as 'very important' or as 'important'. The current study did not ask teachers to rate environmental education in comparison with other learning areas. However, the vast majority of them taught environmental education and they were able to discuss both

instances of doing so and the methods they used in the teaching of environmental education.

Another study that showed teachers' positive attitudes towards environmental education was that of Papadimitriou (1992, Greece). Teachers said that they considered environmental education to be as important as the other disciplines taught in school. Again, the current study did not ask teachers to discuss environmental education in relation to other disciplines. Nevertheless, the fact that the teachers claimed they taught environmental education using their school's surroundings indicated that the teachers can be stimulated by their surroundings to teach in environmental education.

The sixth key conclusion of the current study concerns the implementation of environmental education in the school curriculum. It shows that the English teachers did not want environmental education to appear as a designated separate subject, while the Greek teachers would not mind having environmental education established both as a subject in its own right and as part of other disciplines. The literature review showed that teachers did not see the place of environmental education in the school curriculum as a subject in its own right. Schwaab (1982/83, USA) indicated that the majority of his study's sample reported favouring environmental education as a part of other courses. His sample comprised teachers from all school levels and it was notable that half of the high school respondents considered that environmental education could be a specific course. In the study of Ham and Sewing (1987/88, USA), whose sample comprised elementary school teachers, teachers thought that science (62.6%) was the subject through which environmental education should be taught. Social studies (36.3%) came second and 29% of the teachers thought that it could be taught through the whole curriculum. The current study showed that the English and Greek teachers who thought that environmental education should be taught through the curriculum discussed various disciplines such as maths, history, science, language. Teachers did not define science as the most prominent discipline through which environmental education could be taught. The study of Dorion and Gayford (1990/91, England) indicated that 98% of the teachers agreed that environmental education should be an integral part of the school curriculum rather than a separate subject. However, 33% of them thought that it could be a separate subject as well. Papadimitriou's (1992, Greece) results showed that the majority of teachers believed that environmental education was related to all

subjects, so teachers from different disciplines could collaborate with each other. Gayford and Dillon (1993/94, England) concluded that the most popular way of teaching environmental education was through subject teaching (62%) and 33% stated that they taught environmental education through personal and social education. An interesting study was that of Simmons (1996, USA) which investigated whether teachers felt that environmental education was mainly science-oriented. Her results indicated that the teachers referred to various disciplines and to various activities depending on the settings they were given (e.g. rivers, ponds, country park, urban nature.). Hence, the teachers of Simmon's study considered environmental education to not only be science-oriented. Finally, Ballantyne's study (1999, Australia) showed that over 90% of the teachers agreed with the statement that environmental education should be taught in all subjects across the curriculum. It becomes clear that in most research projects, teachers considered that environmental education was better delivered in the school curriculum through other disciplines, whilst its appearance as a separate subject was endorsed by fewer teachers.

The seventh key conclusion of the current study concerns the lack of teachers' knowledge about environmental education and about environmental issues. Other studies, such as the study of Ham and Sewing (1987/88, USA), indicated what teachers felt they lacked the most. In their study they gave teachers a list of fourteen barriers and asked them to rank them according to the difficulties they caused in practising environmental education. Lack of environmental education instructional materials was one of the four most important barriers. Teachers of the current study claimed that they lacked information on environmental issues. If they had the necessary information, then they felt able to find ways to teach it to pupils. Hence, it was not as much the actual material but the lack of factual knowledge that teachers of the current study emphasised.

Dorion and Gayford (1990/91, England) noted that teachers asked for training courses that would provide them with ways of incorporating environmental education into their practice (96%) and that teachers also stated that they lacked knowledge concerning controversial issues (66%). The English and the Greek teachers of the current study did not mention controversial issues and how they can be taught to pupils and they asked for courses concentrating more on knowledge rather than on teaching guidance.

Spork's study (1992, Australia) indicated that lack of resources and lack of the teachers' own knowledge and skills in this area were some of the teachers major concerns. Ballantyne (1999, Australia) indicated in his study that some of the obstacles that teachers rated as most important in preventing them from teaching environmental education were lack of knowledge and training in environmental education.

One can discern that in the studies whose sample was comprised of teachers that were not identified as committed to environmental education (Ham and Sewing 1987/88, Spork 1992, Ballantyne 1999 and the current study) teachers stated a lack of knowledge and skills in environmental education generally. In the study of Dorion and Gayford (1990/91, England) whose sample had been identified as people involved in the management and implementation of environmental education, teachers discussed a lack of knowledge concerning controversial issues and a lack of appropriate methodology for incorporating environmental education into their practice. Controversial issues were not mentioned either in the current study or the studies that have just been discussed. Rather lack of knowledge seemed to be the obstacle which needed to be surmounted for teachers who were not providing an environmental education curriculum. While the ones who did provide an environmental education curriculum identified a need for ways of incorporating environmental education into their practice. It is possible to argue that the teachers identified as providing an environmental education curriculum have come to realise that factual knowledge alone on environmental issues was not enough to effectively deliver environmental education.

The eighth key conclusion of the current research indicates that teachers had anthropocentric views towards the environment. Such a conclusion was drawn from the teachers' replies which regarded the possible detrimental effects on the environment as being of greater consequence to humans rather than the planet as a whole. Instead, Ballantyne's study (1995, Australia) indicated that the environmental concerns of its sample stemmed from the Guardianship concept. The Guardianship concept which prevailed over the Egocentric and the Ecocentric concepts was motivated by the interest for future generations and the survival of the planet. In the current study the Egocentric concept –motivated by self interest- was more prevalent.

Both the English and the Greek teachers of the current study claimed that society was not environmentally literate and that developed countries were more environmentally literate than the developing countries due to education, to economy, to the media, to technology. Teachers' views, that is, were underpinned by technocentric ideas. Such technocentric ideas were detected in teachers' views in the study of Cross (1998, Scotland and USA). Cross wanted to investigate how teachers perceived the term sustainable development. Hence, teachers discussed sustainable development in terms of population and resource consumption, they acknowledged that development needed to have limits for sustainability to be achieved and they considered that sustainable development can be mainly achieved by science and technology. Education on its own cannot do much. Teachers viewed themselves as agents of social change but they also discussed the limits they have working within a defined curriculum. Both the current study and that of Cross (1998) indicated the teachers' belief in science and technology. Both studies also reported the teachers' concerns about the ecological status of the planet. However, this did not seem to change teachers' views as to whether science and technology can provide solutions to environmental problems.

11.4 Recommendations for action.

The similarities and differences which have been identified between the English and the Greek teachers lead to suggestions which can help in the development of environmental education in schools. Hence, recommendations from the current study propose:

1. A stronger emphasis should be placed in the school curriculum of both countries on the threefold distinction of education ABOUT, IN/THROUGH and FOR the environment and on appropriate links than can and should be made among these three distinctions. If teachers are to understand and implement the inter-disciplinary character of environmental education, then they need to become aware of how these three elements can be linked in themselves and to all aspects of the curriculum as a whole. Hence, additions need to be made to the national curricula of both countries which reflect this concern. More specifically, a possible addition could be the presentation of case studies of environmental education programmes. These can help teachers realise the importance of all three aspects of environmental education (ABOUT, IN/THROUGH and FOR). They should be presented in such a

way that they do not simply appear to be 'good recipes' for teachers to follow. The aim should not be to encourage teachers to just imitate and copy them. Instead, these case studies should show teachers how an environmental issue can be seen holistically, involving various school disciplines which can promote education ABOUT, IN/THROUGH and FOR the environment. Nevertheless, this is not an easy task because teachers do not have systematic training in environmental education and because the curricula of both countries primarily define the scope and content of the knowledge pupils should acquire in each key stage.

2. Field study centres should be mentioned in the curriculum. Teachers need to be aware of these centres through published guidelines. Apart from general information that they might have on the field study centres, it would certainly be positive to have examples of how they could take advantage of such resources from an academic perspective. Certainly the reference to field study centres in the curricula of both countries will popularise their existence and their work. It is important, though, to highlight that these centres are there to provide schools with resources. By no means, should they act as a substitute for the lack of environmental education in schools. That is, it should be made clear that visiting such centres does not mean that environmental education is out of the schools' and teachers' responsibility.

3. The development of school policies for environmental education should be encouraged through the national curriculum. Such policies are fundamental to the development of environmental education in schools. They will help more teachers to familiarise themselves with the term. Teachers who were interviewed for this study and belonged to the same school did not seem to have the same commitment to environmental education. Thus, it becomes clear that if a teacher works on environmental education that does not mean that his/her colleagues in the same school share the same interests. However, if schools have a written policy relating to environmental education, its importance will have a high profile and more teachers may become interested in it. The national curricula should encourage the development of such policies but schools themselves should draw their own up. A problem that can prevent a school from developing such a policy can be the total lack of interest from any teacher in the school to instigate that.

4. If the term 'environmental education' is to change to 'education for sustainable development', then this shift needs to be reflected in national curriculum

documentation. The English national curriculum defines 'education for sustainable development' and it includes a section for it under the subject of geography . However, as the current study showed that not many teachers were involved with environmental education, a question arises. Perhaps a change of term now may confuse and intimidate teachers rather than help them practice education for sustainability.

5. Finally, teachers need more pre- and in-service training programmes for environmental education that will reflect the holistic, inter-disciplinary character of it, and the shift towards an understanding of education for sustainable development. These training programmes should help teachers become aware of the different environmental ideologies and how these can influence school curricula and teachers' practices. However, if school curricula retain their focus on education about knowledge, teachers will not have many opportunities to take advantage of environmental inter-disciplinary projects.

11.5 Recommendations for further research.

A major conclusion of the current study relates to teachers' training in environmental education. The results have shown that very few teachers have attended such training courses. More specifically, none of the Greek teachers had attended initial training courses and few of the English teachers (9.3%) had done so, while just over half of the Greek teachers (57.1%) and fewer English teachers (18.6%) had attended in-service training courses. Even though the percentage of teachers who had attended any course was low, it is striking that teachers discussed the media as their major source of environmental knowledge. Such a finding raises questions regarding the efficiency of the training courses and of their content. Further research is required to investigate why there is such a gap in teachers' perceived source of their environmental knowledge.

Another point that emerges from the comparison of the current study with previously published research which needs further research, is concerned with the differences that have appeared between teachers whose commitment to environmental education was taken for granted and those teachers who were not identified as such. The current study along with other studies (Ham and Sewing 1987/88, Spork 1992 and Ballantyne 1999) included in their sample teachers whose commitment to environmental education was not known. These studies indicated

that the teachers' needs in environmental education were concerned with lack of knowledge and skills in environmental education, with a lack of natural science knowledge and with the lack of instructional material in environmental education. In contrast, the studies of Dorion and Gayford (1990/91) and Schwaab (1982/83) whose samples included teachers who were identified as providing an environmental education curriculum, discussed lack of knowledge concerning controversial issues, lack of ways to incorporate environmental education into their practice and lack of information concerning how to use simulation games effectively. It seems that the teachers who are already teaching environmental education have realised that it takes more than factual knowledge to effectively teach environmental education. Hence, their needs appear to be more specific (e.g. information on the techniques of simulation games). However, further research concerning the needs that different teachers have is required in order to establish any causal relationships between teachers' practice of environmental education and their needs.

Also, two of the research studies (Schwaab, 1982/83 Dorion and Gayford, 1990/91) whose samples were involved in environmental education, also considered whether environmental education should be present in the school curriculum as a separate subject. Schwaab's (1982/83) study revealed that half of his high school respondents considered that environmental education could be a specific course. Dorion and Gayford's (1990/91) study revealed that 33% of the primary school teachers, who agreed that environmental education should be an integral part of the school curriculum, also believed that it could be a separate subject as well. Conversely, Papadimitriou's (1992) study, whose sample was secondary school teachers involved in environmental education, believed that environmental education was related to all school subjects and they had collaborated with colleagues teaching other disciplines. Further research can suggest whether teachers who practice environmental education perceive its implementation in school curriculum as a separate subject.

Another difference that emerges from the comparison of the current study with other studies suggests differences between primary and secondary school teachers regarding their views on the presentation of environmental knowledge to pupils. It seems that studies whose sample was either only primary school teachers or comprised primary school teachers as well (e.g. McCaw's 1979, Papadimitriou's 1995, Simmons 1993 and the current study) discussed visiting out of school

locations as a very effective way of presenting environmental knowledge to pupils. Secondary school teachers seemed to prefer more expository methods (e.g. McCaw's 1979, Schwaab 1982/83, Yeung 1996). However, further research needs to be done to establish any causal relationships between primary/secondary school teachers and their choice of teaching methodology.

The current study has also demonstrated that the majority of both the English and the Greek teachers considered the school's role as very important in creating environmentally literate societies. However, they did not make any particular suggestions as to how schools can achieve such a goal. Few teachers mentioned that society seems to be at odds with the school. That is, even though school can teach pupils certain principles, society generally does not endorse such principles on a day to day basis, hence teachers' work becomes futile. Admittedly, the current study's questions did not prompt teachers directly to discuss their own role in creating environmentally literate societies. It was assumed that the school's role should include teachers as well. Nevertheless, teachers felt it was sufficient to say that the school's role is important, without making any particular reference to themselves and how they view their role in school. The current study shows that teachers consider themselves to be merely means to an end. Thus, it would be interesting for further research to investigate how teachers perceive their own role in school regarding the creation of environmentally literate societies.

A final point concerns the use of the term 'environmental education' in order to investigate primary school teachers' views. Lately the term 'education for sustainability' has taken preference over the term 'environmental education'. Teachers of the current study were not prompted to discuss 'education for sustainability'. The terms 'sustainability', 'sustainable development' and 'education for sustainability' have been mentioned, only by a few teachers when they discussed the training courses they had attended or publications that they were aware of. Judging from the teachers' replies to the interview questions, it can be assumed that teachers would not be as responsive to the term 'education for sustainability' as they were to the term 'environmental education'. The fact that the terms 'sustainability' and 'sustainable development' were hardly mentioned by the teachers of the current study, along with the fact that many teachers warned the researcher, just before the interview was to start, that they had not heard much about environmental education, supports the above assumption. However, that is only an assumption, and further

research is required to discern teachers' understanding of the terms 'sustainability', 'sustainable development' and 'education for sustainability' and their perceptions of similarities and differences between education for sustainability and environmental education.

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APPENDIX 1

English teachers' interviews

1) SEX : Male
AGE : Between 30-50
GRADE: Y4

INTER. : What do you think environmental education is and what should its aims be?

RESP. : Difficult question. I would say environmental education is certainly geography, science and aspects in another subjects.

INTER. : Aspects, excuse me?

RESP. : Aspects, different bids of other subjects, so.....

INTER. : Such as?

RESP. : Sort of very broad yet but it's vary....

INTER. : Excuse me?

RESP. : Religious education, so, it's fairly, to be fairly broad, the aims....sort of being aware of what's going on around, around the children, within the village and...[there is an interruption].

INTER. : So, you were saying about the aims.

RESP. : It should be, sort of give the children an awareness of what's happening around them, sort of in the village and globally as well.

INTER. : How long do you think it has existed as part of the school curriculum?

RESP. : I think it's always been taught, to be honest.

INTER. : Always, how was it before and how you think it's today?

RESP. : Well in the past we used to go on environmental walks, was more....

INTER. : Excuse me, environmental?

RESP. : Walks, was more, was more of a, sort of a nature type study in the past whereas today it's...[there is an interruption].

INTER. : OK, you were saying about, I asked you whether, how it was different in the past and how it is now.

RESP. : Yea, yea. In the past probably you would go on a nature walk and watch plants and flowers whereas today there is an emphasis on recycling and global warming and sort of wider issues like that.

INTER. : And this kind of turn, shift happened how many years ago, you think?

RESP. : Change.....probably with the National Curriculum there is more of an emphasis on sort of keeping in touch with what was happening in science and the environment.

INTER. : Do you know any important publications, conferences or other initiatives that have determined environmental's education character?

RESP. : There's the National Curriculum.....em.....what was it called.....Curriculum matters series.....

INTER. : Curriculum matters?

RESP. : Curriculum matters series which were published by Her Majesty Stationary Office, I believe, dealt with things like the environment.

INTER. : It dealt with.....topics on the environment?

RESP. : Yes, I think, yea, it was definitely an environmental, there was a particular pamphlet on environmental education.

INTER. : Which you received in school or.....

RESP. : It came out around the time I was at college, seven years.....em.....about ninteen-ninty, there abouts.

INTER. : Yea, do you remember how did it define environmental education or how.....

RESP. : I haven't a clue.

INTER. : Are there any particular student ages that environmental education should be focused on?

RESP. : No, I would say as soon as the children start school, finding out about the environment, it might be just the school environment, as they get older sort of national and international things are taking into consideration.

INTER. : What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

RESP. : They should be taught not so much of a content but sort of a general feeling of sort of wanting to care for the planet and be aware of things that they're going on

around them rather than having to say 'you've got to do this, this and this'. Sort of create a broad ethos, empathy, if you like, for, for what's going on.

INTER. : What do you think are the best ways of incorporating environmental education in the curriculum? For example, should it be a separate subject or part of a general topic and why?

RESP. : I'd personally, I, I teach it as part of science but also in a broad.....and geography but also in a broad thing we've got, in school we've got a recycling project which all the, the children take part in, we've got a general litter awareness: keep, keep Britain clean and we're involved in campaigns like that so be part of a subject and be separate as well.

INTER. : Yea, separate as, as activities that children take part in.

RESP. : Yes, as children can take part in, regardless of their age or ability.

INTER. : What are the most important areas of environmental education young children should learn?

RESP. : Em.....hard.....em. I think they should be taught a general feeling, if you like, a sort of caring approach towards the environment, it's difficult to say oh.... you need to know about global warming or you need to know about this, I suppose just a general feel for the subject.

INTER. : And when you say a general feel, you define it general knowledge on these issues that you mentioned.....

RESP. : Yes, general knowledge and sort of a wanting to do something about it rather than thinking 'ah...that's somebody else's problem, it's not my problem'. That kind of thing.

INTER. : Yea, make them feel responsible and.....

RESP. : Yea, responsible and feel as if they can have an impact on that.

INTER. : How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

RESP. : Again it's, it's taught through different subjects so we have videos, we use, we use a computer, the most meaningful ways is actually to go outside and do things in their own environment, sort of litter collections and things like that, sort of mini-beasts so things that are actually close to them.

INTER. : So, make it visual for them.

RESP. : Yea, make it visual, make it practical, make it as if it's having some impact on them.

INTER. : Do you teach environmental education?

RESP. : Not, not as environmental education but I teach it through the other subjects as covered before.

INTER. : So, every time you have the opportunity from the subject you teach....

RESP. : Yes, yes, when certain topics lend themselves to environmental education, so in a couple of weeks' time I'll be looking at soils, I'll be....

INTER. : In, excuse me?

RESP. : We'll be looking at soils.....

INTER. : Soils...:

RESP. : Soils and rocks, that lends itself, other times we talked about animal habitat and the like.

INTER. : So, will you actually plan something for environmental education in, in this teaching?

RESP. : Yes, I'll, I'll cover that, I'll cover different aspects of that, yea.

INTER. : Do you feel you need more environmental information or teaching guidance on environmental issues?

RESP. : Yes, but you need that and everything really, so....

INTER. : So, both information and the teaching guidance to teach these....

RESP. : I think information because things are changing rapidly.....providing the information and sort of accessible ways so that you don't have to pile through loads of reading before you deliver something.....

INTER. : Before, excuse me?

RESP. : Before you deliver something, before you teach something.

INTER. : Yes, when was the last time you carried out an environmental project or you had references to environmental issues in your teaching?

RESP. : Well, I've just done 'the children and tidy Britain competition' which, which we've talked about as a class and we, we were burning things.....

INTER. : You were burning?

RESP. : Yea, we've, in science we have to burn different materials and see how they react and we discussed what would happen if you had to burn all our household waste, so we were, so that was just last week.

INTER. : Yea, that was part of the science subject?

RESP. : Yes, that was part of science, but also had environmental impact.

INTER. : Yea. Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?

RESP. : Both, I'd do it on my own or I could do it as a broader school, I feel fairly confident in both, I am.

INTER. : Have you ever used your school's surroundings in order to teach environmental education?

RESP. :Yes, we do that all the time. We've got conservation area, we've got school garden, we've grown litter collections and the likes, but we're using the school grounds all the time.

INTER. : So, you're actually take your class in the immediate school environment very often.

RESP. : Yes, yea, all the time, all the staff do.

INTER. : Are you engaged in any activities or organizations that will enable you to understand environmental education and plan any environmental activities?

RESP. : Yea, I'm a member of Friends of the Earth, so, so that would count I would have thought.

INTER. : Yes, and you get quite often information packs from there or you need to write to them and ask specific information.

RESP. : Well, I get information from them, so.....

INTER. : They send it to you in an often base or you ask....

RESP. : Well, I get it sort of via a group that I'm active in.....

INTER. : Excuse me?

RESP. : I'll get it via the group I'm involved with, so, I'm fairly, I'm kept fairly well up to date.

INTER. : Have you attended any pre- and in-service training programmes for environmental education?

RESP. : No that I can think of. No I don't.....

INTER. : Neither pre- nor in-....

RESP. : Pre-, pre-teaching I have but not while I've been at the job.

INTER. : So, you had some pre-service training in environmental education?

RESP. : Yes, yes there was some aspects devoted at environmental education.

INTER. : Devote.....some aspects in, under, under other heading?

RESP. : Yes, generally under other headings but there was definitely environmental education.

INTER. : But it wasn't specifically....

RESP. : No, it wasn't said that this is environmental education.

INTER. : Yea. What do you think are the most significant environmental issues affecting the world today and why you think that these are the most significant?

RESP. : I think the problem with the waste, recycling, general population control.

INTER. : Why you think that these are the most significant?

RESP. : Well, population control because of find out resources which are being sort of used up very rapidly which links with a need to recycle and sort of rethink of how our society provides things for itself.

INTER. : Where do you think your knowledge of environmental matters has come from?

RESP. : News, some general reading, discussion programmes, TV mainly.

INTER. : Yes. There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

RESP. : I don't think either is most important. I think you pick up information from both, so you can't really say: oh, that's more important. In terms of developing your feelings and the like probably sort of informal interaction with other people rather than seeing someone on TV.

INTER. : So, both ways are important.

RESP. : Yes, both ways are important.

INTER. : Do you think we live in an environmentally literate society, I'm talking about European developed, developing countries and in the world generally and how do you see school's role in creating future environmentally literate societies?

RESP. : I think that certainly the children are more aware of environmental matters than I was when I was their age, so I think the TV and schools are making some impact, sort of developing an environmentally literate society.

INTER. : So, younger people from your experience as you see them in the school are more aware as some years ago.

RESP. : Yea, yea much, much more aware than I was when I was eight-nine year old.

INTER. : Yea, what is your idea about people's environmental awareness in general in the world?

RESP. : Emmm.....I think on the whole it's fairly, fairly poor but.....

INTER. : Fairly poor.

RESP. : Yea, I would stop your tape there, I need to think about that. I would say fairly poor in terms of environmental literacy, if you like.

INTER. : What about school's role, how, what's its role to create environmentally literate societies?

RESP. : I think, I think it should have an important role but [there is an interruption].

INTER. : OK, what about school's role?

RESP. : I think the school role is important but there is an emphasis, certainly in the primary school now to go back to basics which is basically maths and English which may have a detrimental effect on sort of things like environmental studies, art, music, areas of the curriculum like that.

INTER. : So, school could play a significant role but...

RESP. : But it may be limited by sort of back to basics kind of push to bring the children up the standard in English and maths.

INTER.: OK Thank you very much.

2) SEX : Female
AGE : Under 30
GRADE: Reception year

INTER. : What do you think environmental education is and what should its aims be?

RESP. : Teaching children about the world, physical features, geography, that sort of thing and also about issues such as global warming, the ozone, about the, issues that need, you know, children need to learn to make things better. What was the second?

INTER. : And the aims of environmental education.

RESP. : The aims? To make children more aware as they are growing up, they probably need to know about, about the world and how to look after it.

INTER. : How long do you think it has existed as part of the school curriculum?

RESP. : In terms of environmental education with that name, then in the last sort of ten years but previous to that I think it's always been covered in sort of nature studies or, you know, under different name but not so much focusing on the, you know, looking after the rainforests or, or that sort of thing but more just observing nature.

INTER. : How do you think, what do you think is the biggest difference between then and today?

RESP. : It's much more concerned with caring for the planet and making sure that the environment is stable and whereas before it was just finding out about it.

INTER. : Yes. Do you know any important publications, conferences or other initiatives that have determined environmental's education character?

RESP. : Obviously there's been some that I haven't been involved in, so, no (laughs), not really.

INTER. : Are there any particular student ages that environmental education should be focused on?

RESP. : No, I think is important to start early with simple, you know, sort of pick up your litter and that sort of thinking and continue it through, obviously all the

children can understand more about the, the wider issues but, I mean my class are the earliest, youngest one in the school, we do environmental education, so.....

INTER. : What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

RESP. : They need to be aware that they need to look after the environment, I mean obviously some issues are too difficult for them to understand but they need simplified versions, so they should be taught, I think about global, global issues, you know,...

INTER. : Such as?

RESP. : .....Rainforests but also closer to home, looking after, you know, the children in my class is looking after the field outside and having the wildlife area and the conservation area in school and as they get older just gradually extending the area, areas that they cover.

INTER. : So, in primary school from early years till they leave primary school you cover more or less the same topics but with more information as they get older, you cover it....

RESP. : In key stage 2 then they look at the issues in a lot more depth, yea, but they also look at different issues at our level the younger ones, it is very much look after the fields and you look after the animals whereas it becomes more scientific and skills based up here.

INTER. : What do you think are the best ways of incorporating environmental education in the curriculum? For example, should it be a separate subject or part of a general topic and why?

RESP. : I think it should be cross-curricular because there isn't enough time to teach everything anyway, so there isn't time to focus on environmental education and because of its links with geography and science already you can cover it within a topic, a topic based approach which is the way you tend to work with my age group anyway. Early years always have a topic based approach. Key stage 2 I would say is more subject teaching but at the same time I think it would be incorporated with other subjects because of the pressures of time, you know, you just can't teach everything (laughs)

INTER. : What are the most important areas of environmental education young children should learn?

RESP. : To have care and respect, not to, I don't know....At start of just by teaching them, I mean very basic, you know, about different environments, field, tree as low as it gets and then in my year group it's just what they need to grow, what they need to survive and how we can help.

INTER. : How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

RESP. : As much a practical real life contact as possible, you know, if you sort of do some environmental work to do with seashore, go to the seashore and look at the erosion and look at the rocks and the sun and the wildlife, it's there because when they see it they remember so much better than just being told, so as much practical as possible.

INTER. : Do you teach environmental education?

RESP. : Yes, but not under that name....

INTER. : How?

RESP. : It comes, well like I said before into geography, science. The children I teach don't cover the national curriculum, the, well they do their term after they are five but I work towards desirable outcomes which are for children under five which are in different subject headings and what would come under them is a desirable outcome called knowledge and understanding of the world.

INTER. : So, under this topic you have, you teach environmental education.

RESP. : Yes, I think, I would say it was incorporated in.

INTER. : It's something that you plan it beforehand or it's something, it is something that comes up in to the class and....

RESP. : It's planned, all, all the work is planned in to schemes to cover a wide variety as possible but at the same time if something came up because one of the children visited a country or had seen something or brought in something to show the class then that would be an opportunity that you wouldn't miss, you'd say, you know, you'd bring it in then but work is planned generally is not, is not just if it comes up.

INTER. : Yea. Do you feel you need more environmental information or teaching guidance on environmental issues?

RESP. : Yes, certainly for, for my age group because I found.....to answer in some of the questions are difficult because it's sort of what exactly do your class environmental education and then just the line draw between the geography and the science, so, yes.

INTER. : You would need both information and teaching guidance?

RESP. : No just information.

INTER. : Information.

RESP. : Yes, cause I think teaching guidance, each teacher has their own strategies and their own way of presenting information which it works for them and it works for their pupils and, but if the information was there more, more structured, you know, this is what we'd like you to cover, then that would be helpful.

INTER. : Specially, to specify it and divide it from geography and science and.....

RESP. : Yea...

INTER. : As you said before to draw the line....

RESP. : But at the same time it's then you come back to the time difficulty of fitting it in. At the minute it just becomes under those, those, you know, those two subjects have got guidance, it does say you must teach them this and you must teach them that whereas environmental education is not, there's nothing that says, right, cover that, that and that, so that would be helpful.

INTER. : When was the last time you carried out an environmental project or you had references to environmental issues in your teaching?

RESP. : Today (laughs). We visited a farm today with the children.

INTER. : And you've seen, you were working on a certain topic and you planned the visit there or....

RESP. : Yes, the, the topic that we're doing for the whole half term is: pets and farm animals. And so we visited the farm cause a lot of children haven't visited a farm before, visit the farm, look all the different animals and, and it is part of the topic and work in all subjects would come out of that, I'll follow up in English, in maths, in science, geography, history, you know, I do a bit of work in all of these subjects and so environmental education will come in to that.

INTER. : It was a whole day visit there?

RESP. : Yes.

INTER. : A whole day. Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?

RESP. :It is always better to work with colleagues because you can bounce ideas of each other and you do get more from two people sitting planning something than just one. Also just from the organization point of view it's, it takes the pressure off, I was the only teacher there today and I had to do everything whereas if they'd been two of us, we could have talked afterwards and said 'oh that was good', work from that on. So, purely from, not specifically to environmental education for any field trip or project that, yes is very good to work with other people.

INTER. : Have you ever used your school's surroundings in order to teach environmental education?

RESP. : Yes, again it's planned in, in my children, at four or five years old we spent a lot of time within the school grounds, we never leave the school grounds apart from a farm trip like today. Whereas some of the older children will go in to the village and, you know, as they get older, they go further afield, we work entirely within the school grounds.

INTER. : Yea. Are you engaged in any activities or organizations that will enable you to understand environmental education and plan any environmental activities?

RESP. : Not anything specifically to do with environmental education, no, not personally, the school.

INTER. : The school is.....

RESP. : The school has, I'm sure, you know, we, we get magazines....

INTER. : From environmental organizations or generally?

RESP. : I think probably more general but covering environmental aspects.

INTER. : Aspects of environmental education.

RESP. : Yes.

INTER. : Do you know any such organizations that may send or leaflets that may come [there was an interruption]. OK I was asking you whether you know some such publications or organizations.

RESP. : Publications..... I can't think of anything.

INTER. : OK. Have you attended any pre- and in-service training programmes for environmental education?

RESP. : No because my responsibility is physical education and early years, so because of the funding that's available I tend just to go for those areas of responsibility and so whether there are courses on it, it would be the person more with that responsibility, for instance the geography co-ordinator, I could, you do occasionally hear the environ...somebody responsible for environmental education but not at all times....or the science co-ordinator would go.

INTER. : So, because of your subject, because it's, it's not that likely that you get to have training in environmental education.

RESP. : No, very, very unlikely because the funding time that's available and courses that are available, what happens is one member of staff will go on a course and then come back and feedback to the rest, so it wouldn't be my place to do.....environmental education.

INTER. : What about pre-service?

RESP. : Yes, it was covered in my course at university.

INTER. : In which subject, which course?

RESP. : It, well, during education teacher training it does, you know, touch on environmental education.

INTER. : You had it as a separate course or .....

RESP. : No, it came under geography, yea, there wasn't, wasn't specified as environmental education.

INTER. : What do you think are the most significant environmental issues affecting the world today and why you think that these are the most significant?

RESP. : Well the ones you'd automatically say the ones that receive the most publicity which are the rainforests, global warming, sea level changes.

INTER. : Why you think that these are the most significant?

RESP. : Because they receive the most publicity and they are, are gonna affect the world quite, you know, quite, with quite a large impact, that people can do something about it as well, so the publicity is trying and stop it. I think they are significant because they are big, you know, it's....(laughs).

INTER. : Their impact on the world and on people it's big.

RESP. : Yes, yes.

INTER. : Where do you think your knowledge of environmental matters has come from?

RESP. : My, just things I've picked up again through other subjects, the course my teacher training when I was in university and also mainly from news on the television.

INTER. : Yea. There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

RESP. : If you want to acquire it then you would actually go and use a book and look up specifically what you want or use some computer software which would be the most effective way of finding out but what's, what tend to happen is that they'll just be picked up from the informal sources that you were talking about.

INTER. : So, the most important is from books and the most important way of acquiring the environmental knowledge is from.....

RESP. : Media, books, television and computer.

INTER. : Yea. Do you think we live in an environmentally literate society, I'm talking about European developed, developing countries and in the world generally and how do you see school's role in creating future environmentally literate societies?

RESP. : Yes, I'd say it was fairly literate in most countries...

INTER. : Developed?

RESP. : Developed countries, under, developing countries obviously not as much because they haven't got the media coverage for people to access the information and until they have that they can't learn about it.

INTER. : And how, how do you see school's role in creating future environmentally literate societies?

RESP. : Just to continue as we are.... certainly on the issues that need looking at with the children at the level they can understand.

INTER. : OK. Thank you very much.

3) SEX : Male
AGE : Between 30-50
GRADE : All year groups (head-teacher)

INTER. : What do you think environmental education is and what should its aims be?

RESP. : That's a very mixed thing. It's about a whole range of things which impact upon our own community locally, then nationally and internationally and I think it's to raise the children's awareness of issues such as global warming, pollution, the ecosystem and so on.

INTER. : And the aims?

RESP. : To make them aware that the world will not always be here unless, the world as we know it will not continue to function unless we protect the environment.

INTER. : How long do you think it has existed as part of the school curriculum?

RESP. : I think there's always been an element of it in it, for instance when I was a child of five they taught me about the natural environment or, and habitats of animals and so on, we looked at trees and the wild flowers in our own locality but I think there's a greater awareness now because of people's ability to look at television and internet and things like that. An awareness of more global and world wide issues.

INTER. : So the difference is that now it's, it's the, the variety of topics.....

RESP. : Yes, there's greater variety, yes, certainly and, and more knowledge.

INTER. : Do you know any important publications, conferences or other initiatives that have determined environmental's education character?

RESP. : Can you hold? [The tape recorder]. There've been lots of local initiatives and for instance we're involved in one as regards the save of aluminium cans....

INTER. : The?

RESP. : Aluminium cans, there are many local but in international and national level I'm not too sure.

INTER. : And these local initiatives help schools in any way, for instance, the save for aluminium cans you mentioned?

RESP. : Yes, it's brought..... pollution etc. It's important in this locality. We have something called the 'green initiative' in this area and that's being promoted by the Prime Minister himself Tony Blair who comes from a place about four miles from here.

INTER. : Who?

RESP. : He lives four miles from here, his local constituency is Sedgefield, so his home village is four miles from here, yea.

INTER. : So, this local initiatives initiate also projects for schools.....

RESP. : Yes, the local council provide lots of materials and competitions in particular to interest and to promote interest amongst children which regards environmental issues ranging from protection of wildlife habitat to pollution of rivers and streams to litter.

INTER. : And you as school, as a school you can always turn to them and ask for information or any kind of help.

RESP. : Yes, all schools are given that information whether they ask for it or not and then they use it as they see fit.

INTER. : Are there any particular student ages that environmental education should be focused on?

RESP. : No, it's, it's done with each child at their level, at their own level, appropriate to their age and stage of development and there are certain issues within the National Curriculum which lend themselves to certain areas of environmental study.

INTER. : So, all school ages are appropriate.

RESP. : Yes.

INTER. : What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

RESP. : Start with the locality in particular your own locality, it's more pertinent, more relevant to the children then. For instance we have a wildlife garden in our own school grounds where we study habitats of things such as worms and spiders and, and the smallest of creatures and we look at the trees and the grasses and so on in our own environment, we look at the impact that we have upon that so we talk about litter and so on.

INTER. : So, the locality is the first....thing that primary school children should...

RESP. : Yes, we start with the locality and then go to sort of county wide, nation wide and then internationally.

INTER. : What do you think are the best ways of incorporating environmental education in the curriculum? For example should it be a separate subject or part of a general topic and why?

RESP. : Yes, we, we include it in our general topic work, principally now I would say because there's so many constraints upon the curriculum that the curriculum is actually overloaded, so to teach it as a separate subject as it were, it would be almost impossible. Anyway it ranges across such broad issues that it can be in part and be relevant in several areas.

INTER. : What are the most important areas of environmental education young children should learn?

RESP. : That we've got to work at things together, that each one of us as a single person can impact upon the environment of others, other human beings and other animals and so on and that's important that we consider other people and other needs, not to be selfish.

INTER. : OK. To make children aware that they can make a difference, they can participate.

RESP. : Yes, yes.

INTER. : How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

RESP. : The, the visual media, media is much more relevant to the children, a picture paints a thousand words so television and film and video have the major impact upon the children, posters and pictures, comedy and making things fun is very important for the children too, so, cartoon characters and these sort of thing seem to register with the children, yes.

INTER. : Do you teach environmental education?

RESP. : Yes.

INTER. : Would you feel that you need more environmental information or teaching guidance on environmental issues?

RESP. : Not particularly, I think we have quite a wealth of information handed to us, particularly through the local councils and so on.

INTER. : So, it is ok both for information and for teaching guidance.

RESP. : No, we need more teaching guidance, so we have information but maybe the manner which we put things across some times, we need some guidance on that, yea.

INTER. : When was the last time you carried out an environmental project or you had references to environmental issues in your teaching?

RESP. : We are now presently undergoing that.

INTER. : A project?

RESP. : Yes.

INTER. : Which is?

RESP. : We're looking at the impact of litter upon the and the impact of, sorry, littering our own environment but also the impact of the new buildings here upon the local wildlife. So, there's a lot of housing being built on what was open land, where there was a lot of wildlife, so, we're looking at the impact upon the birds in particular but also some of the other wildlife that they are there, mice and so on.

INTER. : So, children will go out of school and not only in the school grounds but also in the immediate area.

RESP. : Yes, just a bit further in the area, yea.

INTER. : And it's a project that the whole school.....

RESP. : No, just the some of the year 5 children.

INTER. : Yea. Would you feel more confident to carry out and environmental school programme on your own or in collaboration with your colleagues and why?

RESP. : It always helps to work with other colleagues, you bounce ideas of one another, somebody always has, two heads are better than one as the old saying, so you get more ideas and it's better to have somebody who can support you rather than work alone.

INTER. : Have you ever used your school's surroundings in order to teach environmental education?

RESP. : Yes, as I say we have an environmental garden in the school.

INTER. : Yea. Are you engaged in any activities or organizations that will enable you to understand environmental education and plan any environmental activities?

RESP. : No.

INTER. : Have you attended any pre- and in-service training programmes for environmental education?

RESP. : Not recently, not in the last three years.

INTER. : What about before that?

RESP. : Yes, the problem is that there are always new initiatives and new priorities and therefore the school develops a plan annually as regards what will be its main priorities and because of funding therefore our courses and in-service training are all linked to those priorities and environmental education has been low on the priorities for several years now.

INTER. : Before the recent, the last recent three years do you remember what kind of courses in environmental education had you attended?

RESP. : In fact it's more than three years but I would say really in the last ten years there's been a demise of environmental education in-service. The last thing I can remember going on personally was about how to develop an environmental garden within your own school grounds.

INTER. : And it was organized by?

RESP. : By the Local Education Authority, yea.

INTER. : What do you think are the most significant environmental issues affecting the world today and why you think that these are the most significant?

RESP. : I think, sort of the morality of it all is a very important point in that we see people who are burning down rainforest to breed more cattle, we see people commandeering land, natural environments to grow crops, maybe those crops might be heroin, poppies or whatever it might be and it seems to me that the morality of things, we forget we see sort of an impact but we fear to see the morality, the fact that there is food available or a food mountains, supplies of food and yet there are people and children starving to death in the world and.....

INTER. : So, people is the worst enemy towards people?

RESP. : Yes, exactly, that we have a world of minority who have and a majority who have not and the underdeveloped countries, the, I think we should erase, you

know, eradicate the world debt that many countries in Africa and South America have and, and parts of Asia, they are never going to repay it, the rich and poor countries, the differences there are horrendous.

INTER. : So, the most significant environmental issues, the differences between the first world and the third world countries and how mostly in the first world treat the third world. And why you think that these are the most significant?

RESP. : Yea, because human relationships are the most important thing in the world and if we can't care for one another how can we be expected to care for the world we live in, I mean they go hand in hand.

INTER. : Where do you think your knowledge of environmental matters has come from?

RESP. : The media, television, newspapers in particular, yea.

INTER. : There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

RESP. : The interaction is probably the most important experiential learning when you actually living it and being involved in it is the best way to learn, however it's probably the most difficult to organize, because of the pressures of life generally. There are so many other pressures and therefore people prioritize and they cannot be bothered to put it bluntly to get it on the backside and walk out and do something....

INTER. : Excuse me?

RESP. : Yea, get out and do something, they'd rather sit and take it in from the television because it's so much easier, to become proactive and do something about it [the tape finished].[People that go out in the] streets and march and demonstrate and write to their MPs and make petitions and try and do something as regards issues that they find serious tend to be looked upon as mad, the vast majority of people are inactive and how we make these people active is very difficult. The vast majority of these take in information and knowledge via the media, television and newspapers. We may contribute financially to a good cause but most of us don't actually go and do something about things, which is what needed, we need more people to do, to be active.

INTER. : Do you think we live in an environmentally literate society, European developed, developing countries and in the world generally, and how do you see school's role in creating future environmentally literate societies?

RESP. : I think in the developed countries we're certainly more literate than the underdeveloped countries but there is also an issue there in that the manner in which many people in underdeveloped countries live is in their old ways and so on...

INTER. : Is, excuse me?

RESP. : In their old ways, they haven't got cars, they haven't got the, the agricultural machinery, they don't use pesticides or fertilisers, they use the old methods, so therefore they maybe promote the environment whereas we in the developed countries do more damage even though we're more aware because of the media, because of television and satellite television and the internet and so on.

INTER. : So, underdeveloped countries are more environmentally friendly because of the lack of technology and all this progression that people in the first world have.

RESP. : Yes, it's in the first world is immoral in a sense because they are saying do as we say not as we do, this is what they're telling people or, internationally you should do this, you should do that but they aren't taking the lead themselves. The United States in particular seems is always got a huge say in world politics, what the world should do, however the United Sates are fairly very immoral in some of the issues as is Britain. Britain should take more of a lead and I think that the present government is taking more of a lead than the last government.

INTER. : And how do you see school's role in creating future environmentally literate societies?

RESP. : It's very important that we get that message....all over to the children that they are the future and it might not seem important to them now but when they grew up they are going to be the people who are making the decisions and making the policies for this country and the world and they can have a say and therefore they've got, we've got to give them balanced information which they can make up their own minds but therefore if they've got the information there's a chance that they can make the right decisions or the best decisions.

INTER. : OK. That's it, thank you very much.

RESP. : Thank you.

Greek teachers' interviews

1) SEX : Female
AGE : Between 30-50
GRADE : Forth (KS2)

INTER. : What is environmental education and what do you think its aims should be?

RESP. : I think that environmental education is a subject, even though it hasn't been established as such, which puts certain frames as to how children should behave towards their environment.

INTER. : Yes, could you, please, be a bit more specific? When you say frames,what do you mean?

RESP. : Frames.....well, that is, how they can act, even, in their games, in the way they behave, in school.

INTER. : As far as their behaviour towards their environment is concerned?

RESP. : Yes.

INTER. : What should its aims be?

RESP. : I think that the aims of environmental education are to help every person to be activated on the environment's protection. Because we hear all the time about protecting the environment, about being activated, but I think we are all words and not actions.

INTER. : So, it aims to activate children and people.

RESP. : Yes, certainly. Active behaviour, not only passive.

INTER. : How long do you think it has existed as part of the school curriculum?

RESP. : From my limited experience, I would say that we have very few hours for environmental education. To make myself clearer, in lower classes, we have the subject 'Study of the Environment' [otherwise called 'We and the World'], where, there, we have brief references concerning the atmospheric pollution, the sea pollution. There are also pictures, and that's how we analyse some things, but our time is limited. We cannot make a much wider reference and we don't have the time to go out, even in the yard or to the sea or to the beach, in order to do things such as picking up litter with the children, so as to see in an active way, what does that mean.

INTER. : So, environmental education is limited in school curriculum to references that you can make through the subject 'Study of the Environment'.

RESP. : Exactly.

INTER. : When did you realise the existence of such references? That is.....

RESP. : Well, this is my third year of teaching and there are such references all these three years.

INTER. : So, for three years now.....

RESP. : But I remember that since my years [meaning since her school years], there weren't such references.

INTER. : So, these references exist the last years, the last three years as you said.

RESP. : [She sighs positively].

INTER. : Do you know any important publications, conferences or other initiatives that have determined environmental's education character?

RESP. : Well, conferences on an international level?

INTER. : Either on an international, or national, or even initiatives, on a local level, which might have influenced environmental's education character.

RESP. : On a local level, well, last year that I was working in Nafplio [a Greek city in the South] there were some in-service training programmes for environmental education. To tell you the truth, I didn't think they were much educative.

INTER. : Did you participate in these training programmes?

RESP. : Yes, yes. They lasted one day and they were comprised of two hours. There was a specialist.....

INTER. : A specialist?

RESP. : He was a forester, and from what I had found out, he had been educated on such programmes.....

INTER. : Are you talking about school programmes?

RESP. : Yes, yes, exclusively for school classes.

INTER. : And I imagine that they [that is these school programmes] had to do with forests.

RESP. : Yes, mostly with forests, with the goods we can get from a forest, how our behaviour should be when we are in a forest, all these things.

INTER. : So, it was a two-hours training seminar, lasting a day, and it was concerned with the forest. Was that a programme that had taken place in another school or did he talk to you simply.....

RESP. : No, he, just simply, talked to us.

INTER. : That is, it hadn't been realised in another school.

RESP. : No, as far as I know.

INTER. : Was it organised by.....

RESP. : It was organised by the local office for Primary Education in that city.

INTER. : Are there any particular student ages that environmental education should be focused on?

RESP. : No, I think that even from the first grades, children are quite clever to perceive the meaning of environmental education. Of course, we need to give it to them with much simpler examples, with more pictures. Well, I'm telling you this because when, once, I was teaching in first grade, I had asked them to drawn how they imagine pollution, atmospheric or sea pollution. And all children drew very nice things. A child had drawn a sea with dead fish out of the water, another one had drawn a forest full of smoke and rubbish.

INTER. : So, they could perceive.....

RESP. : Yes, certainly.

INTER. : And certainly it is for all ages, even the young ones.

RESP. : Yes, that's what I think.

INTER. : If we go a bit backwards, at the previous question, you said that you hadn't found the training programme as particularly educative.

RESP. : Yes, maybe because it was only about forest, about the goods that a forest gives us and it didn't help us, that is the teachers, because it was for teachers, so, it didn't help us in showing to us the best way we can use to teach children. That is, it didn't help us to approach this issue in a better way, or even to give us new techniques concerning the way we can present the topic.

INTER. : So, it gave you knowledge but not teaching guidance.

RESP. : And something else is that in most of the schools that we work, we lack audio-visual material which I think that it is very important. You know, slides, video that sort of stuff.

INTER. : Yes. Well, the information you got from that training seminar, did you use it in school at some point?

RESP. : Not much, not much.

INTER. : So, it gave you knowledge but not.....

RESP. : Not essential knowledge, not the things I was expecting to get. Because the things that they told us were things that I could retrieve from an encyclopedia.

INTER. : Yes. What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

RESP. : Yes. As a separate subject in each class?

INTER. : Well, how do you think environmental education should be incorporated in school curriculum? Well, that is the following question, the previous one was concerned with the content of environmental education.

RESP. : Yes. Mostly, with pictures for lower classes.....

INTER. : Yes, what kind of issues do you think that the primary school curriculum should have? That is, what kind of environmental issues.

RESP. : Issues which can be concerned with all pollution problems. Well, children know that we shouldn't throw rubbish in to the sea or that we shouldn't throw cigarettes.....these are things that they know. So, I think that a brief reference to those things is enough. It has to show to children with pictures and with words, oral and written, what they should do.

INTER. : Could you, please, be a bit more specific and explain what do you mean when you refer to what they should do? Can you mention some more specific environmental issues which you think that they are appropriate to be taught to primary school?

RESP. : First of all, from their school area, we have told them repeatedly not to throw rubbish in classroom or outside and if you go out, even though they know that they shouldn't throw rubbish out, you will see much rubbish out. And again the same old story, going out and picking litter up and talking to them about it.

INTER. : So, one issue concerns cleanness.....

RESP. : In their personal area.

INTER. : Some other issue?

RESP. : Hygiene.

INTER. : Meaning being clean on themselves.

RESP. : Yes, in the atmosphere, in their house, in the forest because we often go on excursions there, or on a street and then in sea as well, which they like it a lot.

INTER. : So, environmental's education content has to do, mostly, as you described it, with the cleanness they have to have on themselves and on the areas where they live.

RESP. : Yes, that's how I think it is.

INTER. : Yes. Besides cleanness, are there any other issues you could touch with primary school pupils?

RESP. : For environmental education?

INTER. : Yes, environmental issues.

RESP. : For higher classes, in the geography class, there's a very small reference to the atmosphere's layers. It talks about the ionsphere, the ozone hole.....I think that for fifth and sixth classes, we should pay some more attention to that, mentioning the ultraviolet beams, that is to make this issue a bit more complicated, something that it is not possible to do in other classes.

INTER. : So, another issue could be about the ozone hole through the subject of geography.

RESP. : Yes, yes.

INTER. : What do you think are the best ways of incorporating environmental education in the curriculum? For example, should it be a separate subject or part of a general topic and why?

RESP. : I would say that it would be better if it was a separate subject because, so far it is implemented and the time is limited. It is implemented in a subject and....

INTER. : Is it implemented in a particular subject?

RESP. : Yes, in the subject 'Study of the Environment' and we have few references to the environment, in one, two or, in a better situation, in five classes. And then, nothing. So, if we have it as a separate subject.....

INTER. : Excuse me, when you say in one, two or five classes, what do you mean?

RESP. : I mean units of a lesson.....

INTER. : During the school year.

RESP. : Yes, yes. The teacher has a certain frame within which he/she can move, no matter how much sensitive he/she is, or how much he/she wants it. They can spend neither one or two months on such a unit. It is totally impossible. So, one hour weekly, or even one hour every two weeks as a separate subject.

INTER. : You mentioned one hour every two weeks.

RESP. : Yes, yes.

INTER. : In order to acquire more time and....

RESP. : And emphasis. It is different if you have it as a separate subject than just making a reference in class.

INTER. : Yes, so, it will acquire more gravity.

RESP. : Yes, certainly, certainly.

INTER. : What are the most important areas of environmental education young children should learn?

RESP. : What do you mean?

INTER. : I mean environmental issues which you consider very important and which you, as a teacher, feel that you want to teach your pupils.

RESP. : First of all, it should be the protection of forests, especially now that we can see it with all the rain and floods.

INTER. : You mean the consequences...

RESP. : Yes, of the fires..... Another issue is the pollution of the atmosphere which comes from car emissions, from factories, from cars. The pollution of their personal area. These, I think, are the most important.

INTER. : How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

RESP. : Well, I told you with pictures, with slides, with video. This way the lesson becomes much better.

INTER. : Why?

RESP. : Because when we stay only on words, children become passive recipients while when they see, they can visualise the words and this is important.

INTER. : So, they have a much more direct contact with what they are taught.

RESP. : Yes, certainly, and something else is that we should go out as well, and for instance, clean a place such as a beach or a school.

INTER. : So, we're talking about active participation.

RESP. : Yes, certainly, certainly.

INTER. : Do you teach environmental education?

RESP. : Not as a separate subject but I try to. And as I teach lower classes all the time, I try through the subject of 'Study of the environment' by enriching my lesson with pictures I bring, with paintings, I'm letting children make drawings, showing to me how the children feel about it, how they perceive it. But not as a separate subject.

INTER. : So, you take stimuli from the subject 'Study of the environment' and you try to enrich it more.

RESP. : Yes.

INTER. : Do you feel that you need more environmental information or teaching guidance on environmental issues?

RESP. : I think I need teaching guidance.

INTER. : Why is that so?

RESP. : Because so far we didn't have it as a separate subject and while we know how to teach all other subjects, since university years, when we were taught these things, we never had such a subject.

INTER. : So, it is something that you have never been taught.

RESP. : Yes.

INTER. : And that's how you feel that you need more....

RESP. : As far as knowledge is concerned, well, there are many leaflets, encyclopaedias and if we want, you can learn many things.

INTER. : You can look for these things, that is, on your own.

RESP. : Yes, on our own.

INTER. : When was the last time you carried out an environmental project or you had references to environmental issues in your teaching?

RESP. : In my teaching? Last year I had attended the training seminar....

INTER. : Yes, I'm not referring to that training seminar, I'm asking whether you have undertaken an environmental programme with your class.

RESP. : Yes, well, the first year I worked in Mitilini [a Greek island], because I was on a coastal area, the whole school had participated in an environmental education programme and we had cleaned the beaches there.

INTER. : Yes. How long did that last?

RESP. : From what I can remember it was three times in a month.

INTER. : That is, you went to three different beaches in a month.

RESP. : Yes, yes.

INTER. : And what kind of environmental issues did you touch, through these three visits to the beaches?

RESP. : The cleaning of the beach, the sea pollution and because the time this activity had happened was spring to summer, we spotted the problem.....

INTER. : The problem?

RESP. : The problem of sea pollution and that this was something of their immediate interests because these are the people who will swim and that's why it was their duty to leave beaches clean.

INTER. : Did that programme start with the initiative of....?

RESP. : With our school's initiative but there was an urge, as well, from the office.

INTER. : Of environmental education you mean?

RESP. : Yes.

INTER. : And was it the whole school or your class?

RESP. : The whole school, because it was a small school.

INTER. : And that was two years ago?

RESP. : Yes, yes.

INTER. : Do you have any more recent environmental references that you happen to remember?

RESP. : More recent we had last year when we cleaned our school and we picked up litter from the school yard.

INTER. : Did you do that on your own or with the whole school?

RESP. : With my class and without having any urge from nowhere. It was for a lesson of mine, through the subject 'Study of the Environment', concerning the pollution of the atmosphere, of the sea, etc., and as I couldn't do anything else in order to instigate a more active participation.....

INTER. : You went out in school yard. And did that last a teaching hour?

RESP. : Yes, one teaching hour.

INTER. : Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?

RESP. : I think with colleagues' collaboration is better because it is much more organised and much more clustered.

INTER. : Have you ever worked with colleagues' of yours? Well, you have mentioned that some years ago you did the beach cleaning....

RESP. : Yes, well, three years ago. Again, I remember that it was suggested to us to do a project for the environment.....

INTER. : Who had suggested that?

RESP. : From the office of Primary Education but I don't know whose initiative it was and we would present it to the university of Thessaloniki but we didn't show any interest and we didn't do anything. The topic was about plant poisons and their effect on the soil pollution.

INTER. : But there wasn't any interest.

RESP. : Well, I had found some things, some papers. I had started doing something but then I dropped it. And it would, also, have to do with a lake that is in Komotini [a Greek city], its pollution, etc.

INTER. : When you did the beach cleaning activity, what sort of help did the office for environmental education, on a local level, give you?

RESP. : Nothing.

INTER. : It just suggested the topic to you and.....

RESP. : Nothing else, nothing else.

INTER. : Did you ask for anything in particular?

RESP. : No, no, we didn't ask for anything.

INTER. : Have you ever used your school's surroundings in order to teach environmental education?

RESP. : Yes, certainly.

INTER. : You mean the cleaning of the beaches and of the school yard you mentioned earlier.

RESP. : Yes.

INTER. : Are you engaged in any activities or organisations that will enable you to understand environmental education and plan any environmental activities?

RESP. : No.

INTER. : Have you attended any pre- and in-service training programmes for environmental education?

RESP. : Only the one I told you before.

INTER. : That is the two-hours training seminar.

RESP. : Yes, and nothing else.

INTER. : Do you happen to be aware of any such training seminars for environmental education?

RESP. : No. If I were aware, I would participate in them.

INTER. : What do you think are the most significant environmental issues affecting the world today?

RESP. : I think that the first problem, from what I hear, is the pollution of the atmosphere with the famous to all of us, ozone hole.

INTER. : Why do you think that this is the most important?

RESP. : Because from what I know, the atmosphere layer is being attacked, resulting to more ultraviolet beams which are harmful to us.

INTER. : So, it causes....it has negative consequences on humans' health.

RESP. : Definitely.

INTER. : Where do you think our knowledge of environmental matters has come from?

RESP. : I can attribute it to the fact that I want to get informed because I'm a citizen and I want to be aware of such things. And even more because I'm a teacher and I want to give more things to my students.

INTER. : Yes, where do you get that knowledge?

RESP. : From documentaries I watch and I think that lately there are many such programmes on TV and from some informative leaflets. [The tape finished]

INTER. : There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

RESP. : I think that both play an important role. Certainly, as far as books and documentaries are concerned, they are better, but I think that the contact with others also helps.

INTER. : Why do you consider books and generally the formal sources as better sources of information?

RESP. : Because I can come in touch with these things on my own and I become better aware of these things. I come in touch with these things first, I digest them, I analyse them, I judge them and then I have the comfort to discuss them with others.

INTER. : So, they give you a more valid information.

RESP. : Yes, that's what I think.

INTER. : Do you think we live in an environmentally literate society and I'm talking about European developed, developing countries and in the world generally.

RESP. : I think that we are a country that we are aware of the environmental problems but we don't anything in particular.

INTER. : That goes for us, as Greeks.

RESP. : [She sighs positively]

INTER. : Can you spot some differences between developed and developing countries as far as their environmental literacy is concerned? Do you think that developed countries are more literate.....?

RESP. : Yes, I think yes.

INTER. : In comparison to developing countries.

RESP. : Yes.

INTER. : Where do you think this is due to?

RESP. : Because developing countries have other problems to solve first and they don't pay much attention to environmental issues. They are much more concerned with nutrition issues and, so, these kind of problems come in a second place. Instead us, that we have solved all our problems [she says that while laughing], we have that as a first problem.

INTER. : So, developed countries have the environmental issue on a better agenda.

RESP. : Yes, I think so.

INTER. : How do you see school's role in creating future environmentally literate societies?

RESP. : From the new writing samples we get from books, I feel optimist that things will get better, that teachers will be better educated and I think that new books will have more new material to pass such messages to children.

INTER. : What makes you think something like that?

RESP. : I make my judgements based on the two changes that happened to books the last years, where books are enriched with such issues.

INTER. : The last how many years approximately?

RESP. : The last 2 or 3 years. And there is another fact that makes me feel like that, I see that from time to time, specialists come and training seminars take place in school.

INTER. : Do these people that come are teachers who have been working on environmental education or are these people specialists on environmental issues?

RESP. : People that are specialists on environmental issues, not teachers.

INTER. : And how have these things come to your attention?

RESP. : From my personal experience, I saw them in the school I've been. I saw that some people had come and they had done such raining seminars. Well, the problem was that they were using terms that they thought that children understand them.

INTER. : So, these specialists that came, talked to children and not to you?

RESP. : Yes, to children. Then, after they left, I had to say all these things again.....

INTER. : Did that happen? Is it a particular incident?

RESP. : Yes, the programme that we had last year about the forest, when a forester had come who had been a specialist and he gave a seminar in my class.

INTER. : Well, excuse-me, I thought that this forester had talked to teachers.

RESP. : No, that forester had come to the class. Another seminar took place for teachers.

INTER. : Which it didn't have to do with the forest?

RESP. : No, no, it was more of a general character.

INTER. : It didn't have to do with environmental education?

RESP. : No.

INTER. : So, the one we mentioned earlier about the forest, it was.....had you invited him to come and talk to school?

RESP. : No, the initiative belongs to the local office of Primary Education and it was for all schools of the county.

INTER. : So far the work that is being done in school, how would you judge it?

RESP. : I think that it is enough. It is happening just for the sake of it.

INTER. : What do you mean?

RESP. : It takes place only during our lesson and then everything is forgotten.

INTER. : Do you mean during your lesson of 'Study of the Environment'?

RESP. : Yes, yes.

INTER. : So, that is not enough, it needs something more.

RESP. : Yes, it would be better if we had a separate subject.

INTER. : Thank you very much.

2) SEX : Female
AGE : Between 30-50
GRADE: Sixth (KS2)

INTER. : What do you think environmental education is and what should its aims be?

RESP. : It's a programme where both the teacher and the pupils should participate in procedures that concern the environment.

INTER. :Yes and what should its aims be?

RESP. : To enable students to find out what is happening to the environment and what they could do, later on as citizens, to offer their best.

INTER. : How long do you think it has existed as part of the school curriculum?

RESP. : I would say for two years now.

INTER. : And how is it expressed in school curriculum? What is that exists the last two years which it didn't exist before?

RESP. : There's no something in particular in all schools, well, now, there must be tree-planting activities, or activities concerning recycling, so as children can see what is going on.

INTER. : These sort of activities, which you mentioned now, are they activities that the school curriculum includes them?

RESP. : Yes, I think that they are mentioned.

INTER. : As independent activities or through certain subjects?

RESP. : Both through the subject 'We and the World' and independently, as well, the teacher with the pupils can make such decisions.

INTER. : Yes. Do you know any important publications, conferences or other initiatives that have determined environmental's education character?

RESP. : Yes, from the local office of Primary Education, there were some informative displays for teachers, but, as usual, these kind of documents would either have such things written in very small letters or they would arrive at school late, so not all teachers would be informed.

INTER. : So, teachers wouldn't get the information at all, either because it would arrive late or because the information wasn't given to teachers the way it should be given.

RESP. : Yes.

INTER. : Are there any particular student ages that environmental education should be focused on?

RESP. : No, for all ages there are certain things you can teach.

INTER. : What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

RESP. : Primary school pupils can refer to many issues but on a lesser extent of the one that high school pupils have. But I believe that young children are able to get to know everything with simple words. That is, they are able to get to know about the pollution of rivers and seas and especially higher classes can also understand how river pollution is caused by plant poisons and sea pollution by waste. The forests with the toxic rain.....of course, younger ages will understand it with much simpler words but I think that all issues concerning the environment can pass through all ages, from the youngest, that is, the kindergarten pupil.

INTER. : And issues like pollution, toxic rain.....

RESP. : Yes.

INTER. : What do you think are the best ways of incorporating environmental education in the curriculum? For example, should it be a separate subject or part of a general topic and why?

RESP. : Definitely it should be a separate subject.

INTER. : Why?

RESP. : Because the environment concerns everyone and we should pay great attention to the environment because we are heading from bad to worst.

INTER. : So, because of the gravity that the issue has.....

RESP. : Yes, it should be a separate subject.

INTER. : With its own schedule period.

RESP. : Yes, so as to be able to do something more, because during the teaching hour, you cannot speak as much for an issue.

INTER. : What are the most important areas of environmental education young children should learn?

RESP. : The most important? The pollution of rivers, seas and definitely the recycling issue.

INTER. : How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

RESP. : First of all it should start with the problems that begin within the school premises, with the litter that children throw down, with whether there are trees to make shadows in summer, because, here, in Greece since May there's heat and children cannot play out in the yard. And that's how they can get motives to look, in the same way, at their neighbourhood, at their village, at their city and generally at the whole world.

INTER. : With what ways can we show to children these issues, so as to instigate their interest even more and make them understand these things from the school premises or the neighbourhood?

RESP. : In the classroom we can present, we can give children the motive to take pictures of a neighbourhood in their area, to see the condition in which they are, to show some pictures of neighbourhoods that are clean and so make comparisons. From magazines we can find pictures of forests burnt by toxic rain or by fires.....the green which you get pleased when you look at it. With excursions on leisure places where they can have fun while if there wasn't such a forest, they couldn't be happy.

INTER. : Making it, that is, tangible for the children.

RESP. : Yes, yes, making it visual and making them feeling it.

INTER. : Do you teach environmental education?

RESP. : No, I haven't taught so far.

INTER. : Do you feel you need more environmental information or teaching guidance on environmental issues?

RESP. : More material is definitely needed in schools but also we need time to do some things, that is, children should have the chance to go out, visit a place and see how things are. If there's no time.....

INTER. : You as a teacher, what do you feel you need the most? That is more material and environmental knowledge or teaching guidance?

RESP. : I believe that we mostly need material because teaching guidance is something that everyone can work out.

INTER. : So, you mostly need information on environmental knowledge because teaching guidance.....

RESP. : That can be worked out by a teacher.

INTER. : When was the last time you carried out an environmental project or you had references to environmental issues in your teaching?

RESP. : Well, I never did an environmental project but environmental references [there was an interruption]. Every time that.....in a whatever topic we were discussing, we would have environmental references but in particular, through the subject 'We and the world', we can have such references and say more things from what the book says.

INTER. : Yes. Do you happen to remember in particular an environmental reference you had lately?

RESP. : We have had many. More particularly, we have talked about the waters, because it is a plain, here, in Krinides and we talked about the pollution of a small river, that is around our area, coming from handicraft industry and from the various plant poisons that are used exceedingly. Every person can buy as much plant poison as he pleases.

INTER. : How long ago did that reference take place?

RESP. : Last year, around May.

INTER. : And how long did it last? Was it more than one teaching hour or...?

RESP. : Yes, well, it took place when we visited this industry, it didn't happen in a particular subject.....

INTER. : What kind of industry was that?

RESP. : We visited an industry which makes socks. When we arrived there and after we had seen how the work is separated in different sections, children told me that this industry's waste come out at the river that is here. And there used to be much fish in that river and people were fishing but within few years, we realised that it has become a mire.

INTER. : These were things that children themselves realised them?

RESP. : Yes, they realised this themselves.

INTER. : Did that reference and visit take place after a stimulus you've got from a subject?

RESP. : Yes, we, mostly, took a stimulus from the School Life teaching hour because we had some more free time. But, it also started from a unit we had in the Language subject which it was about Charlie Chaplin and how he was screwing bolls and we wanted to see how they work in a factory and what is the particular job that everyone is doing. And that's how we got the stimulus and we talked about the factory's waste and where they are disposed.

INTER. : Yes, and that's how you visited the factory and you saw pollution....

RESP. : Yes, the pollution it creates.

INTER. : And how long did that reference last, after you had visited the factory?

RESP. : Well, the discussions were taking place quite often, I mean, that is just an example, but we talked about the plant poison that are poured, with the rain, and they are used exceedingly in this area. Every time we had the chance, we would talk either about the toxic rain, or the pollution of rivers, seas, etc., even though in sixth class there wasn't the subject of 'We and the World' but we had geography and every time I try to have such references to the environment.

INTER. : Usually, these references that you make, how much time do they take up from your teaching hour in class?

RESP. : Well, depending on children's interest, we may even lose a lesson for which I don't care as long as children will understand certain things.

INTER. : So, they are dependent on children's interest.

RESP. : Yes, on children's interest.

INTER. : Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?

RESP. : I would like to have my colleagues' collaboration, firstly, because the ideas of one person are not the same with many people's ideas, and, certainly, more colleagues would also mean more children to work with, so, much more people would be interested in that.

INTER. : Have you ever worked with colleagues' of yours for an environmental school programme?

RESP. : No, I haven't.

INTER. : Have you ever used your school's surroundings in order to teach environmental education?

RESP. : Even it is not indicated for such a thing, yes, I have used it.

INTER. : In what way did you use it and when? Do you remember something in particular?

RESP. : We were able to persuade the head-teacher, along with the parents' club, to buy some trees, because there weren't any, to clean some of the weeds that there were around and to plant.....

INTER. : That was for the school yard or around the school?

RESP. : That was for the school yard and for around school yard, because around here there was only cement and nothing else. Besides, from the one side we weren't allowed to do anything because there is a football field and from the other side there is the street.

INTER. : And when did that happen?

RESP. : Last year.

INTER. : And when you say 'persuade' , do you mean that.....

RESP. : We had some discussions.

INTER. : Yes, well, when you say 'persuade', it indicates an effort which might have not been positively welcomed.

RESP. : Yes, that's true.

INTER. : Was it due to money?

RESP. : It was about who was going to organise it because, as usual, everyone wants to escape from things like that.

INTER. : And finally, who undertook it? Was it your initiative or the whole school.....?

RESP. : Finally, it was the whole school and not only my class. And on the Environment Day we decided to make our place more beautiful and plant some flowers, take out the weeds, plant the trees.....

INTER. : So, was it an initiative that some teachers had and they suggested it to the head-teacher?

RESP. : Yes, teachers suggested it to the head-teacher and then it was realised.

INTER. : Are you engaged in any activities or organisations that will enable you to understand environmental education and plan any environmental activities?

RESP. : No, I don't have much time for that.

INTER. : Have you attended any pre- and in-service training programmes for environmental education?

RESP. : No, there wasn't such a subject in university, or something else similar to that. And as for later, as I told you before, there's no a particular interest in that.

INTER. : Yes. Are you aware of any such in-service training programmes for environmental education in which you could participate?

RESP. : No, at that moment, I don't know any.

INTER. : What do you think are the most significant environmental issues affecting the world today?

RESP. : Rubbish, this is a big issue because there's no recycling and wherever there is such a scheme, we see that it is a private initiative and that we don't have anything in particular from the State. We see how seas become polluted, fish do not exist any more, they become less and less. Levels of pollution are also growing in the atmosphere as well.

INTER. : Why do you think that these are the most important?

RESP. : Because without water, without air and without oxygen, I don't think that there's going to be life on planet.

INTER. : So, they have a direct effect on our life. Where do you think your knowledge of environmental matters has come from?

RESP. : To my own zeal. Whatever I know, I have learnt it on my own.

INTER. : And where do you actually get this information?

RESP. : From various books, magazines, newspapers, whatever comes to our hands.

INTER. : There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

RESP. : I would say that both ways are important, because with the picture and the information you get from newspapers and magazines, you can learn many things. But personal experience is as important because unless you live something, you cannot become aware of it, or it just passes by your life without noticing it.

INTER. : So, a combination of the two.

RESP. : Yes, a combination.

INTER. : Do you think we live in an environmentally literate society and I'm talking about European developed, developing countries and in the world generally.

RESP. : I don't think that the developed countries.....well, they also have big problems as the developing ones. I would even say that developing countries could give us examples concerning the relationship man-environment. For instance, people that live in a jungle, they know the soil well and they know how to recycle their products, how, which season to collect fruits, etc. Instead us, we live in another jungle, in the jungle of cement and cars. We don't have to separate countries in developed and developing because they both give examples to each other. Developed countries say what they want to do, while developing countries do it much better. For instance, as far as rubbish is concerned, developed countries have great mass of rubbish, while developing countries, I believe that they have much less.

INTER. : Where do you think this is due to? That is, the developing countries seem to be more environmentally literate than the developed ones. Where do you think this is due to?

RESP. : Yes, this is due to the fact that they, still, haven't been so much dependent on machine and they are trying to live through their environment. Instead, people that are dependent on machine, they forget where they came from.

INTER. : So, the developing countries are more environmentally literate than developed ones.

RESP. : Well, we could say it like that.

INTER. : How do you see school's role in creating future environmentally literate societies?

RESP. : The way it is now? Because, now, I don't think that it gives.....it rests with every teacher.

INTER. : So, now, the school's job is.....

RESP. : It's up on teachers' sensitivity and on how much they are interested in the environment.

INTER. : And that means that if they are sensitive, they will do much things about the environment, if not, then.....

RESP. : They will stay at the things that the books say. As much as books are referred to the environment and how much a teacher is able to expand on such an issue.

INTER. : Yes. Ideally, what could be the role of school in creating such environmentally literate societies?

RESP. : I believe by giving more time in these subjects for the environment, otherwise through the lesson that it is given by teachers, and quite few times, it is sterile, then sterile knowledge it will give.

INTER. : So, as you said before, it should be a separate subject with more hours.

RESP. : And certainly some other subjects which are not as.....or at least, some more hours could be added, all schools could become all-day schools where children could stay there all day but for something like that, other things are needed such as building structures and etc.

INTER. : At the beginning of our conversation, you said that environmental education has been in school curriculum the last couple of years. Before these two years, how was the situation? That is, there weren't such activities like recycling, as you mentioned?

RESP. : No, there weren't such activities.

INTER. : So, they appeared the last two years.

RESP. : Yes, and there is an office for Environmental Education the last two or maybe three years. Before that, there wasn't an office for Environmental Education.

INTER. : Thank you very much.

3) SEX : Female
AGE : Between 30-50
GRADE : Third (KS1)

INTER. : What do you think environmental education is and what should its aims be?

RESP. : It's the education for teachers, for students and, generally, for all people on issues concerning the environment. Approaching issues relative to human relationships, showing sensitivities to topics, where that is necessary from present situation. It's about an effort aiming to make people sensitive on issues which will upgrade the quality of life.

INTER. : What should its aims be?

RESP. : It should be about bringing everyone in contact with the outer world, with topics which are unexplored for them. It should make them study these topics, discover its history, reflect on them and, finally, conclude to results which can be useful to all. Everyone could learn a lot more about an animal, a plant, a weather or a social phenomenon, after he/she studied it better than staying with knowledge taken from an encyclopaedia.

INTER. : How long do you think it has existed as part of the school curriculum?

RESP. : There were always, indirectly, stimuli and references to environmental issues in school curriculum. There are such references, mostly, in the subject 'Study of the Environment' but whoever is sensitive can find stimuli in all subjects and make such references. The last 3-4 years I hear more about environmental education through newspapers, leaflets and personal investigation. But there's nothing really systematic from the office for Primary Education, that is, in-service training seminars, educative material, etc.

INTER. : Do you know any important publications, conferences or other initiatives that have determined environmental's education character?

RESP. : No.

INTER. : Are there any particular student ages that environmental education should be focused on?

RESP. : All can participate in such a programme, regardless their age, as long as the topic is adjusted to their age.

INTER. : What do you think environmental education should entail in the primary school curriculum? What should be taught to primary age pupils?

RESP. : The relationship between man and the environment. It should present the present situation with the pollution and the problems that are attributed to it. They should be taught about nature, about green and about the fires and how we can protect forests. Also, it should include issues concerning better residence and better work environments referring to differences between the life in village and in city. Other issues could be protection of the environment, cleanness and recycling.

INTER. : What do you think are the best ways of incorporating environmental education in school curriculum? What should be taught to primary age pupils?

RESP. : If there was much free time during teaching hours, it could be implemented with many ways and it could be more effective than having it as a separate reference in a separate subject. When learning is happening with references through issues that have already been taught, then the stimulus passes more evidently to children. So, in this way, everything consists a chain of knowledge which can sensitise everyone easier.

INTER. : What are the most important areas of environmental education young children should learn?

RESP. : Protection of the environment, respect towards people and towards the environment. Right attitude towards people, towards animals and towards the environment in general. There should be an effort of changing the attitude, mostly the one of adults that prevails today, through children.

INTER. : How could accurate environmental knowledge be presented to young children in a meaningful and challenging way?

RESP. : At the beginning we need a stimulus such as a picture or an extract which will instigate children's interest. Children should investigate themselves the issue. Mostly children lead the investigation and bring other, various issues up. They can conclude to results. During the investigation an excursion or a visit could take place, in order to collect data. If it's possible, it would be nice if there were drawings, songs, theatre, games.

INTER. : Do you teach environmental education?

RESP. : I have references in class, when there's a stimulus, in all subjects such as the 'Study of the Environment', the Language subject, Religious Education, History, etc.

INTER. : Do you feel you need more environmental information or teaching guidance on environmental issues?

RESP. : A more concerted education to both, it would be necessary. The education of everyone has become a personal issue, especially knowing that in Athens certain training seminars are realised and teachers are informed and educated about environmental issues.

INTER. : When was the last time you carried out an environmental project or you had references to environmental issues in your teaching?

RESP. : I haven't undertaken a programme and my last references were about the city, the village, residence in these places, leaving villages for cities. This reference took place last week. We mentioned the differences between city and village, we talked about pollution and noise-pollution, about the green and how there are opportunities and more job offers in a city. It lasted the whole teaching hour because the nature of the lesson was environmental.

INTER. : Would you feel more confident to carry out an environmental school programme on your own or in collaboration with your colleagues and why?

RESP. : In collaboration with my colleagues because collaboration always brings better results.

INTER. : Have you ever worked with colleagues of yours on such a programme?

RESP. : No.

INTER. : Have you ever used your school's surroundings in order to teach environmental education?

RESP. : Some times I used the least 'green' there is in school. Last year, on Environment's Day we all worked as a school and we painted the external walls of the school, we cut weeds and we planted new plants. We take care of our class environment, we want it to be clean and our yard as well. We have some pots on the window brim. In spring-time we make a plant album and we talk a lot about the villages plants.

INTER. : Are you engaged in any activities or organisations that will enable you to understand environmental education and plan any environmental activities?

RESP. : Yes, Greenpeace and WWF. I'm getting information on what their activities are, through their campaigns and their leaflets which are concerned with the environment's protection. I contribute to their task financially. Their leaflets support my environmental knowledge but they don't give me teaching guidance.

INTER. : Have you attended any pre- and in-service training programmes for environmental education?

RESP. : No.

INTER. : Are you aware of any such in-service training seminars in which you could participate now?

RESP. : No.

INTER. : What do you think are the most significant environmental issues affecting the world today?

RESP. : Pollution.

INTER. : Why do you think that these are the most significant?

RESP. : Because there are many changes happening in flora and fauna and climate changes are occurring and these things are influencing people's life in a bad way.

INTER. : Where do you think your knowledge of environmental matters has come from?

RESP. : From books, from TV programmes, from Greenpeace, from WWF.

INTER. : There are formal sources such as books and TV and informal sources such as living and interacting with people in a community absorbing facts, ideas and attitudes from the experiences. Which of these two ways, according to you, is the most important and effective for acquiring environmental knowledge?

RESP. : Both ways. Certainly, we need specialists to talk to us about special issues because they are well-aware of them. But daily life, as well, as it is developed through human's relationships, human's contacts, supply people with positive or negative knowledge.

INTER. : Do you think we live in an environmentally literate society and I'm talking about European developed, developing countries and in the world generally.

RESP. : We still have many steps to take before we are going to be considered environmentally literate, either we, that is, the residents of developed countries, or the people who live in developing countries who, some times, they are considered more environmentally literate instinctively. Developed societies have caused irretrievable harm to the environment, in the name of development. Instead, developing societies have a more harmonious relationship with nature because they lack development. In Greece there's no environmental literacy, mostly in adults, because everywhere you see dirt, indifference, abandonment, without police surveillance on cleaning issues.

INTER. : How do you see school's role in creating future environmentally literate societies?

RESP. : It is very serious, after family. Through teaching and advice children learn to care both for the natural and social environment. So far, the work that is being done in school is adequate because it rests with teachers' beliefs.

INTER. : OK. Thank you very much.