PARTICIPATORY PROGRAMME DEVELOPMENT AT AN ENVIRONMENTAL EDUCATION CENTRE THROUGH ACTION RESEARCH INVOLVING SECONDARY SCHOOL TEACHERS

THESIS

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ABSTRACT

This mini-thesis documents and analyses an action research project which I conducted with secondary school teachers. The teachers wished to learn more about environmental education so that they could run their own programmes. I, on the other hand, wanted to improve environmental education programmes offered at the centre where I worked. I hoped that through encouraging teacher participation and involvement, I could begin a process through which the teachers themselves could contribute to, and be in greater control of, their own learning in environmental education.

As an introduction to this mini-thesis, I provide some background information on the centre, and state the reasons for having embarked on this project. In addition, I outline the literature and various research findings pertinent to this study.

For the purpose of this study, I have selected emancipatory action research as a mode of research, since I believe that emancipatory action research, which embodies processes of reflection and informed action, constitutes the possibility for authentic, emancipatory change in the practice of teachers. The bulk of this thesis, therefore, documents the first two cycles of the action research process and the experiences of those involved in the process. I also briefly comment on some of the claims of action research as a method for research.

An important feature of this thesis is that it addresses the possibilities of and constraints to implementing education for the environment in the teachers' practices. The existence of the latter is acknowledged and discussed from my perspective and those of the participating teachers.

The study, furthermore, documents teachers' understandings of environmental education, and how this determines the kind of environmental education activities in which they engage.

In the final analysis, I argue that the education system we inherited from the apartheid regime has had the effect of producing passive, disempowered and highly demotivated teachers with extremely low levels of self confidence and assertiveness. Despite this fact, I have not only had the opportunity to witness some positive attitudinal changes occurring in teachers as the study progressed; the project has also enhanced my own understanding of environmental education and the effect the apartheid education system had in shaping my own thoughts and life.

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TABLE OF CONTENTS

CHAPTER 3: RESEARCH METHODOLOGY

CHAPTER 4: RESULTS AND OUTCOMES OF THE STUDY

Appendix 7.1 - 7.2

Appendix 8

Appendix 9.1 - 9.2

Appendix 10.1 - 10.2

Appendix 11

Appendix 12

Appendix 13.1 - 13.4

Appendix 14

Appendix 15

LIST OF ABBREVIATIONS

CNE	Christian National Education
DEA	Department of Environment Affairs
DE&T	Department of Environmental Affairs and Tourism
DSP	Dominant Social Paradigm
EE	Environmental Education
EEASA	Environmental Education Association of Southern Africa
EECI	Environmental Education Curriculum Initiative
EEPI	Environmental Education Policy Initiative
EERU	Environmental Education and Resources Unit
FP	Fundamental Pedagogics
INSET	In-service education for teachers
IUCN	International Union for Conservation of Nature and Natural Resources
SAIRR	South African Institute of Race Relations
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UWC	University of the Western Cape
WCS	World Conservation Strategy
WWF	World Wide Fund for Nature

CHAPTER 1

INTRODUCTION TO THE RESEARCH

1.1 Historical background : The Environmental Education and Resources Unit

Over the past six years, the Environmental Education and Resources Unit (EERU), based at the University of the Western Cape, has conducted various activities in environmental education. The Unit currently has three main areas of activities, namely a nursery which grows indigenous plants, a nature reserve consisting of 30 hectares of indigenous veld and a resource centre offering a range of environmental education activities. These activities range from resource production for schools and communities to pre- and in-service teacher education. They also include indigenous planting projects, talks and workshops for teachers and others and field studies for visiting groups.

The origins of the Unit lie in the establishment of a nature reserve (proclaimed a monument in 1978 by the National Monuments Council) for conservation purposes, to protect the dwindling vegetation on the Cape Flats. It was not until 1989 that some academics - scientists at the University of the Western Cape - realized that the nature reserve had the potential to be a valuable resource for outdoor and environmental education. This realization led to the establishment of the Environmental Education and Resources Unit in 1990. Over time, the staff at the Unit developed their understanding of environmental education through participating in various conferences, workshops, seminars and courses, such as the M.Ed. in Environmental Education offered by Rhodes University.

The theory underpinning the current approach to environmental education by the staff at the Centre draws on the IUCN definition of environmental education (IUCN 1971), the Belgrade Charter of

1975 (UNEP 1977) and the Tbilisi principles (UNESCO-UNEP 1978). Furthermore, the realisation that environmental education is more than conservation, through developments in the field, such as the emerging socially critical approach to environmental education as described by Fien (1993), Huckle (1993), Robottom and Hart (1993), has also influenced the views of the staff at the Unit to environmental education.

1.2 Reasons for embarking on the study

As the impact of this broadening approach to environmental education started to sink in, so the staff members at the Centre began to grapple with the reasons behind the somewhat passive way educational programmes were presented at the Centre. I, for example, identified that the teachers who brought school groups to the Unit had a very limited understanding of environmental education, which they frequently equated with studies in Biology or Ecology. Furthermore, I found that these teachers failed to participate in programmes themselves, and did not have the confidence to initiate environmental educational projects back at their schools. Teachers thus seemed to rely on the Centre staff to do all the environmental education for them.

I surmised that there could be two reasons for teachers finding it difficult to practice environmental education. Firstly, environmental education had not formed part of their professional development, thus contributing to a perceived general failure and lack of confidence to implement environmental education on their own. Secondly, the South African education system had been designed in such a way (for a review see Behr 1988, Christie 1985, Hartshorne 1992) that teachers had become the uncritical implementers of prescribed "knowledge" and pupils, passive, inert and used to rote-learning. The dominance of transmission teaching made it extremely difficult for teachers to practice environmental education which, characteristically, requires teachers to have a critical knowledge of the system and their practices.

The Unit's staff, on the other hand, felt a need to improve their existing programmes through addressing the needs of teachers, instead of imposing the Unit's existing programmes on the teachers. Also, due to limited staff, the Unit could not take up all the requests from teachers to take groups. We therefore felt it had become necessary for teachers to become equipped to take their own school groups on environmental education programmes. Such a development, we believed, could also lead to teachers improving their understanding of environmental education which would, in turn, improve environmental education practice in schools. It was therefore decided to initiate a joint study between the teachers and the Unit, to improve existing programmes or develop new programmes at the Unit. By so doing, it was felt, that not only would the needs of teachers be addressed but also, at the same time, a better shared understanding of a broader concept of environmental education may developed.

The rationale for these decisions was underpinned by recent trends in environmental education, which favour a participatory approach to curriculum development (O'Donoghue and McNaught 1991, Robottom 1991). Such an approach enables the participants (both researcher and teachers) to contribute to a collaborative process of developing strategies to deal with environmental educational issues in an educational context. With such an approach, teachers can develop their own resourcefulness by taking responsibility for their own environmental education projects. Participatory action research also allows for dialogue between the researcher and teachers, and is aimed at strengthening both parties in their capacity to contribute to curriculum development in environment education.

1.3 Goals and objectives of the study

The overall goal of this research project was to improve environmental education programmes at the Environmental Education and Resource Unit through teacher participation whilst, at the same time, clarifying the concept of a socially critical approach

to environmental education for all the participants, and what its implications would be within the context of the research. Since a socially critical approach to environmental education is a fairly recently developed approach, I was only familiar with it from studying the literature, and so wanted to explore it at greater depth in a practical context.

To achieve the goal of the study the following objectives were decided upon:

i) To initiate an action research programme at the Environmental Education and Resources Unit, involving the researcher and a group of secondary school teachers who made use of the Unit on a fairly regular basis.

ii) Through this action research programme, to develop a relevant and effective environmental education programme, which would suit the needs of the participants, and which would engage with local and international approaches to environmental education.

iii) To clarify a socially critical approach to environmental education within the context of the work of the Unit.

1.4 Framework of the thesis

In this chapter I tried to explain, in terms of my own experience as an environmental education officer and coordinator of an environmental education centre, what motivated me to begin this study with school teachers who were interested in, and committed to, doing environmental education. The location of the research was also briefly described.

Chapter two documents that literature which forms a background to the study. This chapter also outlines the conceptual development of environmental education internationally, and in South Africa, from a historical perspective. In this respect,

both the more limited view of environmental education, as well as the recent trends in its development, are described in this chapter.

In chapter three I outline the research methodology and explain the aims of action research. A description of all the events in the two cycles of the action research process, and the ways in which the data has been collected, is given. The results of the study are described and commented on in chapter four of the thesis.

In chapter five I discuss not only the results of the project but, in more detail, some of the many issues that arose during the research - issues for example, about action research, about the nature of schooling, and about the constraints teachers encounter when attempting to do environmental education in their schools. I also discuss aspects relating to action research as a research method.

Finally, in the last chapter of this thesis, I provide a synopsis of the conclusions of the study. In addition, in the light of the research experience, I make recommendations to all the participants in this study, as well as to those who are considering the undertaking of an action research study in the future.

On a general note, it is important to be aware that this research report is virtually a direct reflection of the entire participatory action research process itself. Consequently, in its own structure and organisation, this report often echoes the seeming chaos of the process, as the participants, through reflection and growth, continually changed direction. The report does not, therefore, follow a neat, linear sequence, as may be expected from a more positivist research report.

CHAPTER 2

SETTING THE SCENE

2.1 International background to the development of environmental education

The origin of the world's environmental problems stems, at least in part, from the uncritical fragmentalist or reductionist way of thinking reflected in our Western worldviews (Capra 1983, Sterling 1993, Beck 1992). In his book, *The Turning Point*, Capra (1983) blames the mechanistic underpinnings of Cartesian-Newtonian science for destroying an 'organic' worldview, thus changing the relationship between people and the environment. Capra further states that we need a new paradigm - a new vision of reality, a fundamental change in our thoughts, perceptions and values. In contrast to the precepts of the dominant Western worldview, holistic thinking which attempts to be non-dualistic, ecological and systemic is proposed (Sterling 1993). Milbrath (1984) asks for the Dominant Social Paradigm, which views nature as subservient to human needs and economic growth, to be replaced by a New Environmental Paradigm which views people and nature as interdependent.

The environmental education movement started as a response to a concern about environmental degradation and the decreasing quality of life. Although it is difficult to trace the beginning of the environmental movement, some of its roots lie in nineteenth century America and Britain, where American and British conservationists highlighted, respectively, the need to protect the earth's natural resources, and articulated increasing concern about the degradation of the environment caused by the industrial revolution (Wheeler 1975). The response to this degradation of the environment was a growing concern for the preservation of species and areas of natural significance through sound management. It was due to this focus, then, that the origins of environmental education can be traced, not only to the

promotion of nature and outdoor studies, but to the conservation movement as well (Stevenson 1987).

The start of the modern environmental movement, however, can be attributed to Rachel Carson's book *Silent Spring* (1962), which warned of the damaging effect of pollutants on the environment. Beginning, then, with Carson's book, the late 1960s and early 1970s was characterised by the mass media, popular authors and scientists, all increasingly bringing the threats of environmental degradation and the implications of population impact on the environment, to the attention of the general public (Greenall-Gough 1990). This period saw the start of addressing problems concerning the environment at an international level.

At the first international conference on environmental education, organised by the United Nations and held in Stockholm in 1972, it was proposed that environmental education should be interdisciplinary in its approach (as opposed to focussing on nature only) and should take place both within and outside of schools, thereby encompassing all levels of education and the general public as well (UNESCO 1972). The role of education and training to develop responsible populations was stressed. An outcome of the Stockholm conference was the establishment of the United Nations Environmental Programme (UNEP) which, together with UNESCO, was asked to further environmental education internationally.

The first UNESCO-UNEP international meeting on environmental education, the Belgrade International workshop held in 1975, produced the Belgrade Charter. At this conference, the goal for environmental education was described as follows:

> To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has knowledge, skills, attitudes, motivations and commitment to work individually and collectively towards solutions of current problems and the prevention of new ones.
>
> (UNESCO-UNEP 1975)

As a follow-up to the Belgrade Conference, another international conference on environmental education was held in Tbilisi in 1977. The Tbilisi conference, the main goal of which was to discuss actions to implement environmental education, had a socially critical orientation[1] (Greenall-Gough and Robottom 1993). Educationally, one of the recommendations to emerge from this conference was that environmental education should address education and encourage critical thinking (UNESCO 1978). It stressed that environmental education should involve learners in planning their learning experiences, as well as utilize diverse learning experiences and a broad array of educational approaches to teaching and learning.

All the conferences described above had an 'action' component. For example, the 'action' component of the Tbilisi conference (UNESCO 1978:27) was to

> help social group and individuals acquire a set of values and feelings of concern for the environment and the motivation *for actively participating* (my emphasis) in environmental improvement and protection

and

> to provide social groups and individuals with an opportunity to be actively involved at all levels in working towards resolution of environmental problems (UNESCO 1978:27).

However, these noble resolutions did not lead to groups or countries taking action in order to alleviate the environmental crisis.

Another major contribution to developing environmental education was the *World Conservation Strategy (WCS)* (IUCN 1980), which stressed the task of environmental education in fostering or reinforcing attitudes and behaviours to achieve conservation at

[1] See section 2.3.4.1.

a global level. Although the *WCS* not only linked development and poverty but also put the identification of environmental problems and the need to solve them on the agenda, it was, essentially, a movement of the seventies and early eighties. Thus, it was marked by a form of environmental education which was apolitical, naturalist and scientific (Tilbury 1995) and proposed three main objectives of living resource conservation:

- to maintain essential ecological processes and life-support systems;
- to preserve genetic diversity;
- to ensure the sustainable utilisation of species and ecosystems.

Although essentially a document on conservation, the *WCS* highlighted the role of environmental education to change attitudes and behaviours.

The most recent international conference on the environment was the United Nations Conference on Environment and Development (UNCED), also referred to as the "Earth Summit", held in Brazil in 1992[2]. The brief of UNCED was to initiate actions necessary to protect the global environment and to effect sustainable development. In the education programme of the conference, *Agenda 21*, more support to increase public awareness as a basis for taking action was emphasized (Tilbury 1994):

> Both formal and non-formal education are indispensable to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour ... for effective public participation in decision-making.
>
> (UNESCO-UNEP 1993)

In the above outline I have aimed to provide some background to

[2] A previous international conference on environmental education and training was held in Moscow in 1987 (UNESCO-UNEP 1988).

the responses, at an international level, to the imminent environmental crisis. These responses have included the involvement of the United Nations in developing a programme of action (eg. through conferences, reports and policy statements) to determine and promote the role of education in environmental improvement. However, nowhere in the literature have I been able to find any evidence of how all these proposed goals, objectives and guiding principles, as proposed in the Belgrade Charter (UNESCO-UNEP 1977) and subsequently re-endorsed at follow-up conferences, are going to be implemented effectively.

A similar concern, but related to teacher education, was raised by Tilbury (1992). According to her, a great number of international and intergovernmental organisations and agencies have recognised the urgent need to develop environmental education in teacher education programmes. For example, at the International Union for Conservation of Nature and Natural Resources (IUCN) conference (1971), the International Belgrade workshop (1975), the Tbilisi conference (1977) and the recent Rio Earth Summit (UNCED) (1992). However, despite these important conferences, and the growing international and national involvement in environmental education, relatively little has been accomplished, with implementation and environmental education in teacher education still remaining policy rather than becoming a practice[3]. Consequently, a gap remains between the perceived international commitment to environmental education and an adequate degree of practical implementation.

2.2 The historical development of environmental education in South Africa

According to Irwin (1990, 1991) the historical development of 'modern' environmental education in South Africa has its genesis in the early 1970s. Before this period activities focused on concerns regarding soil erosion. Then, until the late 1970s,

[3] For a review, see Tilbury 1992.

environmental education activities were characterized by 'conservation education' and during the 1980s by 'outdoor education'. These 'outdoor or nature' experiences were designed to get the conservation message across, to create awareness, to clarify values and, ultimately, to change the behaviour of those engaging in such activities (O'Donoghue 1993b).

Prompted by the international developments in the environmental arena, the first major Conference on Environmental Education in South Africa was held in 1982. At this gathering the Environmental Education Association of Southern Africa (EEASA) was formed, a body which subsequently contributed largely to environmental education through workshops, conferences, newsletters and an academic journal. EEASA has also played an important role in convening seminars and annual conferences.

The period stretching across the 1980s and early 1990s saw a proliferation of extension strategies, conservation campaigns, and environmental education centres. The key features of the orientation of environmental education over this period were conservation messages and wildlife experiences in order to foster awareness by communicating information *about* environmental issues (facts), and providing experiential learning processes *in* the environment (O'Donoghue 1993b:29). Most environmental education centres established during this period, were usually associated with nature reserves or wilderness areas, and taught field ecology or nature conservation[4].

Nonetheless, a shift from the nature experiences approaches to environmental education, to more relevant participation, was under way by the mid 1980s. This led to community and curriculum approaches, where the participants (i.e. the teachers and their pupils) work together as a 'community of partners' to identify problems and to jointly do something about them within democratic contexts, for example in classrooms (O'Donoghue 1993b). The late

[4] See the *Southern African Journal of Environmental Education* 1985 - 1989 for a series covering environmental education centres in South Africa.

eighties and early nineties featured broader conceptualisations of the environment, in which there were attempts to give as much attention to the social dimensions as the biophysical. For example, O'Donoghue proposed a model of the 'environment' which suggests interactions between social, economic, political and biophysical factors (O'Donoghue 1993a, O'Donoghue and McNaught 1991).

The development of environmental education was also influenced by the contribution of non-governmental organisations (Khan 1990) as well as state conservation agencies. The Department of Environment Affairs, for example, published a *White Paper on Environmental Education* in 1989. Although this was a 'top down' document, it nevertheless provided guidelines based on the Tbilisi principles and Belgrade Charter for effective environmental education as it had been internationally defined.

Despite all these initiatives, environmental education continues to be practised in various ways. In my experiences with teachers and communities, I have encountered a relatively limited understanding of the concept, with most teachers still equating environmental education with outdoor experiences.

2.3 Understanding the concept of environmental education

In his research published in 1979, Lucas developed a model of environmental education which is still frequently cited. He proposed three approaches to environmental education: education *about*, *in* and *for* the environment (Greenall-Gough 1993). These approaches differ with regard to the objectives (knowledge and skills) and interests (social and political) underpinning environmental education. The abovementioned approaches are useful for environmental educators, especially where they assist them in evaluating the purpose of their programmes. The approaches should, however, be regarded as overlapping and complementary approaches to environmental education. These approaches will be discussed here, to illustrate perceived

limitations in the understanding of environmental education.

2.3.1 Education *in* the environment

This form of environmental education, which is also known as education *from* the environment (Huckle 1983), involves experimental fieldwork aimed at interpreting and appreciating the environment (Fien 1988). Learning takes place outside the classroom, either in the natural or built-up environment. With this approach, the hope is that opportunities from direct contact with the environment will lead to increased awareness of aspects of the environment. Such opportunities outside the classroom can be used to develop important skills, such as data gathering and observation.

2.3.2 Education *about* the environment

This approach to environmental education, which has largely cognitive objectives[5], emphasizes learning about natural systems, how they work and how human activities impact on them. It should also include learning about political, economic and socio-cultural factors, as well as ecological ones that influence decisions about how to use the environment responsibly (Fien 1988).

Knowledge about the environment is necessary if citizens are to participate in informed debate aimed at resolving local, national and global environmental issues (Lucas 1979, Fien 1988). This form of environmental education appears to be the most common form practised according to Robottom 1987, Huckle 1991, Greenall-Gough 1991 (from an Australian perspective). Robottom (1987), however, argues that education *about* the environment ignores the social aspects of the majority of environmental issues, such as quality of life and human attributes, beliefs, aspirations and the vested interest which impact on environmental issues. The

[5] For example, students are expected to comprehend and interpret environmental data, and to analyse environmental situations (Lucas 1979).

result is a form of education *about* the environment that is practised in a depoliticised and uncritical form (Huckle 1985). In South Africa, too, it has been my experience that education *about* the environment is practised in this manner.

2.3.3 Education *for* the environment

Education for the environment seeks to engage students (participants) in the active resolution of environmental questions, issues and problems (Fien 1988, Huckle 1991). This involves a wide range of knowledge, skills, values and participation not addressed by teaching environmental facts and concepts (education *about* the environment) or by experimental learning in nature (education *in* the environment) (Fien 1993). Consequently, education *for* the environment is considered most appropriate to the challenge of the global environmental crisis (Fien 1993, Huckle 1991, Robottom 1987). According to Stevenson (1987:73), education *for* the environment involves engaging students in:

> ... the intellectual tasks of critical appraisal of environmental (and political) situations and the formulation of a moral code concerning such issues, as well as the development of a commitment to act on one's values by providing opportunities to participate actively in environmental improvement.

Environmental education *for* the environment builds on education *about* and *in* the environment, to develop an informed concern for the environment, as well as ethics and skills for participating in environmental protection and improvement. This approach, therefore, would include questioning the existing social structures, viewing the existing culture and society critically and being committed to improve society (Kemmis 1983).

The nature of this education locates it in the socially critical traditions of education because of its concern for critical reflection, social negotiation and the organisation of action,

both individually and collectively (Greig, Pike and Selby 1987). Furthermore, education *for* the environment is informed by critical theory (see Fien 1993).

2.3.3.1 Education *for* the environment: Socially critical goals

Education *for* the environment has socially critical and political action goals (Stevenson 1987, Greenall 1987). Robottom (1987) also argues for a socially critical approach to environmental education. Huckle (1991) goes further by arguing that socially critical pedagogy in the emancipatory mould (Giroux 1983), which seeks to empower students so that they can democratically transform society, is the most suitable approach for environmental education in schools[6]. This type of education encourages students (or participants) to reflect on their experience in the light of critical theory and to act on the insights gained. According to Huckle (1991) such an emancipatory or socially critical pedagogy would have the following characteristics:

- learning is active and experiential;
- classroom dialogue introduces elements of critical theory and encourages pupils to think critically;
- pupils begin to see themselves, their histories and futures, in new ways. They develop a sense of their own power to shape their lives;
- values education develops comprehension of the sources of beliefs and values, how they are transmitted, and the interests they support;
- pupils reflect on the structural and ideological forces that influence and restrict their lives and on democratic alternatives;
- pupils are taught how to act democratically with others to build a new social order.

[6] Although the above describes socially critical education in schools, it is my opinion that these characteristics could also apply to other learning environments eg. with teachers.

Education *for* the environment therefore provides for a socially critical or transformative orientation in environmental education and, consequently, is not value free (Fien 1993). It is aimed at helping groups and individuals acquire a set of values and feelings of concern for the environment, an objective contained in the Tbilisi Declaration (UNESCO 1978), and at providing social groups and individuals with an opportunity to be actively involved at all levels in working towards the resolution of environmental problems (UNESCO 1978). This differs from education *about* and *in* the environment, which only provide skills and knowledge to support the transformative intentions of education *for* the environment.

2.4 Environmental education in the formal education sector of South Africa

In my experience at the Environmental Education and Resources Unit (EERU), environmental education in South Africa reveals a lack of critical education *for* the environment. It fails to address social, economic, moral and political dimensions of the environment in that it neglects to address values and problem-solving objectives of environmental education[7].

Although the *White Paper on Environmental Education* (1989) refers to formal education, the previous government and its education systems failed to create a policy for environmental education in formal education. Efforts in South Africa to implement environmental education, albeit predominantly to make pupils aware of the environment and instil in them a sense of responsibility towards it, have taken place mainly outside the formal education sector (Schreuder 1991/2). However, the country had its first democratic elections in 1994, resulting in the beginnings of the reshaping of policy to change the educational

[7] In Australia, two major causes were highlighted for similar failures (Stapp and Stapp 1983). The first was a failure of teacher education programmes to prepare teachers to promote education *for* the environment. The second was a lack of adequate guidelines from education authorities to equip teachers for handling values, for teaching controversial issues and for preparing students to help resolve environmental problems.

situation (Department of Education 1995). *The White Paper on Education and Training* (Department of Education 1995:22) consequently states that:

> Environmental education, involving an interdisciplinary, integrated and active approach to learning, must be a vital element of all levels and programmes of the education and training system, in order to create *environmentally literate and active citizens* (emphasis original)and ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources.

As environmental education has never been part of formal education in South Africa, the Environmental Education Policy Initiative (EEPI), initiated by the Department of Environment Affairs and EEASA, embarked on a process to develop a national education policy for environmental education. Through the EEPI it has been proposed that environmental education should be integrated into all the subjects (not only Biology and Science), thereby making it part of formal education (Clacherty 1993). Other documents have been produced to support the EEPI working documents, such as the discussion document the *Integration of Environmental Education into formal education (DEA and Tourism 1995)* and *The Environment, Development* and *Environmental Education* (Share-net 1993).

Environmental education not being part of formal education has implications for teacher education programmes, in that it does not form part of in- and pre-service programmes. At the time when this study was initiated, teacher education in South Africa was still characterized by fragmentation, with differences existing between the 'different' education departments (on racial grounds). Consequently, there was no co-ordinated in-service education for teachers (INSET) in South Africa (NEPI 1992), thus adding to the difficulty of integrating environmental education into formal education. Environmental education is, with a few exceptions, not a significant concern of INSET programmes (Irwin

1988, Leketi 1992, Wagiet 1996). It was non-governmental organisations (NGOs), supported by sponsors, which have been largely responsible for the environmental education programmes aimed at providing teachers with knowledge and support.

2.5 The role of centres in environmental education

Although the literature on environmental education centres in South Africa is limited, it seems that most centres formed during the 1970s concentrated on awareness through nature experiences (O'Donoghue 1993), a trend which, to a large extent, still continues today. In a directory published by the Department of Environment Affairs (1990) most organisations listed, especially those with centres, were found to be involved in "conservation", "awareness exercises" and conservation of wilderness areas. This situation can probably be traced back to the early responses to the environmental crisis, which were to protect endangered wildlife in nature reserves. Educational methods at the centres therefore centred on nature experiences and dissemination of information about the environment and conservation problems to create awareness (O'Donoghue and Janse van Rensburg 1995). I experienced this kind of orientation first hand, through my experiences with teachers, who still viewed environmental education and teaching ecology as one and the same thing.

2.5.1 The Environmental Education and Resources Unit (EERU)

The Environmental Education centre in this study, known as the Environmental Education and Resources Unit (EERU) has its origin in the establishment of the Cape Flats Nature Reserve (CFNR) at the University of the Western Cape. In 1977, the University Council approved the proposal for the CFNR on the campus. The reserve was to be created for the protection and conservation of the indigenous fauna and flora on the Cape Flats. The reserve was established in response to the concern for the natural veld on the Cape Flats, which was disappearing at an alarming rate due to urbanisation.

In later years, in a policy statement (UWC document RNR 85/1 1985:6) one of the objectives for the reserve was "the furthering of environmental education among the people". The reserve was to become a centre for environmental education and recreation for students, scholars, staff and the general public. It was later proposed to plan an environmental education centre. The university subsequently agreed to this proposal in 1987. The aims of the Environmental Resource Centre and its programme (UWC document RNR DB 89/4 1989:1) were:

i) To promote an awareness of the total environment of the Cape Flats, developing in individuals a concern for the well-being of this environment and the quality of life of its inhabitants;

ii) to achieve a positive attitude of individuals towards the Cape Flats environment;

iii) to assist in improving education by developing programmes which are of benefit to those who are involved in education (the pupils, the student, the educator);

iv) to develop an awareness and understanding of the fundamental importance of ecological processes and how they relate to the individual and community;

v) The conservation and promotion of natural lowland systems in the Western Cape, with special reference to community participation.

The early programmes proposed for the Unit were based on a philosophy that effective environmental education programmes would instil in pupils a new appreciation of their natural surroundings, thus having an important bearing on future decision-making by the same individuals. These programmes were aimed at creating greater awareness in individuals and were based on behaviourist assumptions (see also Robottom 1987).

Cross-curricular environmental education and interpretation programmes were to be conducted amongst local teacher education colleges, schools and communities, using the Cape Flats Nature Reserve and nursery. The Unit was also to provide and develop effective environmental resources in support of the above.

The early programmes, in my experience, were largely education *in* and *about* the environment, for pilot programmes of the Unit have shown that most visiting groups displayed a chronic lack of understanding of basic concepts in ecology, such as "ecosystem", "habitat", "species diversity", etc. (EERU report 1994) all of which are thought to be fundamental to the education of school pupils. With most teachers too, who had passed through the pilot programmes, I found that ecological knowledge was incomplete and poorly understood. The Unit's programmes were therefore aimed at teachers as well.

In more recent times, and through interaction with the South African community in, for example, EEASA workshops, the Unit staff's approach to environmental education has changed. We have started to draw on more recent developments, such as the emerging socially critical approach to environmental education as outlined above.

In the light of the features and goals of a socially critical approach to environmental education, which is to empower students to participate in the democratic transformation of society and to develop a critical understanding of, and an informed commitment to, the improvement of society (Kemmis 1983, Huckle 1991), I have found that teachers visiting the Centre have a limited view and understanding of environmental education. My experiences with teachers have indicated that most of them have failed to actively participate in environmental education programmes and have relied on the Unit to conduct their 'environmental education' programmes.

2.6 Factors limiting teachers' practice of socially critical environmental education

There are numerous factors which impinge on most teachers' ability to engage with socially critical environmental education in their practices. Some of the more pertinent are outlined below.

2.6.1 The nature of schooling

An important factor contributing to teachers' lack of practising socially critical environmental education is the relation between environmental education and schooling (education). As stated earlier, the goals and objectives of socially critical environmental education are concerned with active (attitude and actions) rather than passive (knowledge orientated) education, which stands in contradiction to the way the vast majority of schools are structured. According to Stevenson (1987) and Huckle (1995a), the very nature of schools does not allow for the development of critical thinkers, decision-makers and problem-solvers. In fact, schools have been criticised as reflecting the values of the Dominant Social Paradigm (DSP), which is related to the capitalist mode of production (Fien 1993). In the South African context, Ashley (1989) confirms this viewpoint by stating that the relationships of the capitalist mode of production, or the way wealth is generated in society, are so fundamental that they determine the nature of all other social institutions (such as schooling) and forms of consciousness. Stevenson (1987), too, refers to the uncritical role of schooling in maintaining the present social order. With this type of schooling, the dominant practices in schools are based on the passive assimilation and reproduction of simplistic factual knowledge and an unproblematic truth. The teacher is the source of knowledge who presents facts (from the textbook) to the students. Ironically, such education claims to be value-free (Robottom 1987, Fien 1993).

In socially critical environmental education, however, it is acknowledged that knowledge is socially constructed by the learners (students), who are active in participation and meaning making. Furthermore, there is an overt emphasis on teaching values. However, the teachers' own educational training and experiences do not prepare them for this; in fact, the educational system is generally geared to reproduce the dominant society's values (Trainer 1990), and therefore schooling is designed to be authoritive, disciplined-centred and technical. Schooling prepares and selects people for jobs in the existing production system (Kemmis 1983) and develop values which will perpetuate this system. Here teachers act as technicians, implementing educational values determined by others (Robottom 1987).

2.6.2 Education in South Africa

Education in South Africa has been marked by imbalances, which have ensured that the interests of the dominant minority (also the dominant class) have been enhanced and protected (Van den Berg 1994). In this regard, Meerkotter (1993), for example, refers to the previous government's concern with the unfair "protection" of the interests of the white minority group, while Meerkotter and van den Berg (1994) points out that the education system played a major role in promoting the views that this dominant order sought to establish and sustain.

During the apartheid era, education was administered by a number of racially defined education departments (Walker 1989), steeped in the apartheid ideologies of Christian National Education (CNE) and Fundamental Pedagogics (Ashley 1989, Kallaway 1984, Hartshorne 1992). Consequently, the ideological paradigm of those in power was perpetuated without it being questioned or challenged. It was especially black 'citizens' who were denied their rights to make vital decisions about economic, political and social activities (Meerkotter and van den Berg 1994). Schools in the former Department of Education and Training, for

example, were characterised by processes dominated by teacher talk and the transmission of prescribed "knowledge" (Walker 1989), with teachers acting as technicians rather than reflective practitioners.

In the mid 1980s, the concept of "People's Education for People's Power" began to emerge as a struggle against the profoundly undemocratic and repressive schooling system (Sisulu 1986). For me, People's Education shared similar concerns with socially critical education, as described earlier. These similarities are encapsulated in Sisulu's definition (1986:37) of People's Education as:

> ... education at the service of the people as a whole, education that liberates, education that puts people in command of their lives ... The demand for free democratic people's education we have said is part of, indeed inextricably tied to, the struggle for a free, democratic, people's South Africa.

People's Education as a process was seen as developing "a critical mind that becomes aware of the world" (Molobi 1986:77). During 1987, however, the Government banned People's Education (Meerkotter 1993). Schools continued to function in an undemocratic top-down hierarchial system, where teachers as products of the same educational system, became active participants in the process of maintaining the status quo, namely contributing to the capitalist norms of competition and individualism.

It is abundantly clear from the above, then, that apartheid educational structures mitigated against the development of emancipatory education[8], the importance of which has been articulated, amongst others, by Davidoff (1993a).

[8] This is also true, more specifically, of emancipatory action research praxis (to be described in the following chapter of this thesis).

2.7 Conclusion

This chapter has outlined, in part, the historical and conceptual development of environmental education, internationally and in South Africa. In conjunction with this, education *in*, *about* and *for* the environment, as approaches to environmental education, have been discussed. It has been stressed in this chapter that education *for* the environment, building on education *in* and *about* the environment, should be the ultimate goal of environmental education because of its emancipatory and critical underpinnings. However, it has been pointed out that very little education for the environment has ever taken place in, especially, South African schools. Some of the reasons for this have been outlined in this chapter, and have to do with the misconceptions commonly held by teachers on the one hand, and the educational structures which impact on them, on the other.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, I outline the research methodology, the research plan and the process utilised in the study.

The research method I followed was action research, specifically participatory action research, which I briefly describe below and comment on in terms of its appropriateness for this kind of study. In addition, I go further to mention the research setting, the stages (cycles with phases) of the research process and the techniques for data collection.

In the discussion chapter of this thesis (see section 5.8) I reflect on the methodology in the light of my experiences and observations, and go on to consider the usefulness of action research and participatory action research for an Environmental Education research project.

3.2 Action research : location and description

Action research is generally located within a tradition commonly known as qualitative research (Davidoff *et al.* 1993). The qualitative research paradigm is rooted in phenomenology and recognises that reality is socially constructed (Firestone 1987). Furthermore, qualitative research is concerned with understanding social phenomena from the actors' perspectives rather than with explaining the causes of 'facts'. Qualitative researchers direct their attention to the meanings given to events by participants (Kincheloe 1991). This view is reinforced by the assertion of Kemmis and McTaggart (1988:9) who describe action research as "participatory, collaborative research which typically arises from the clarification of some concerns generally shared by a group". For them, the importance of group activity is

emphasized, as action research is not individualistic. Consequently, in this paradigm, there are no claims of absolute 'truth'. Instead, the individuals' perceptions are a very real aspect of the research material and the researcher is not a neutral observer of objective, quantifiable phenomena.

The rationale for action research in this study is based upon the fact that I wanted the study to be collaborative, involving participants in environment education programme development. A further, possibly more important, aspect of the rationale is that action research shares the assumptions of socially critical environmental education (Robottom and Hart 1993).

The methodology of action research originated in the work of Lewin and Collier (McTaggart 1991). Originally, their studies were not conducted in an educational setting, but both realised that their studies were aimed at involving and democratising research practices (McNiff 1988:22). Lewin described action research as "a spiral of steps" consisting of four stages - planning, acting, observing and reflecting (McNiff 1988:22). Modern approaches to action research are still based on the reflective nature of the original model but have further developed and been refined to include spirals of cycles.

Different definitions of action research have been put forward, one of the most widely accepted being that of Carr and Kemmis (1986:162):

> Action research is simply a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out.

In summary, action research has been described as "trying out ideas in practice" (Kemmis and McTaggart 1988:6), "to learn to be critical of that practice and then to be prepared to change it through understanding of what has happened in the group or

classroom" (Davidoff 1994). Action research is thus an attempt to link the action of the teacher (educator) with reflection (or research) on that action.

The aims of action research (there are two essential aims) are to improve and involve. After the participants have identified the problem to be studied, action research seeks to:

i) improve the practice;
ii) improve the understanding of the practice by the practitioners; and
iii) improve the situation in which the practice takes place (Carr and Kemmis 1986:165).

Carr and Kemmis (1986:165) further argue for three minimal requirements necessary and jointly sufficient for action research to exist: firstly, a project takes as its subject-matter a social practice, regarding it as a form of strategic action susceptible of improvement; secondly, the project proceeds through a spiral of cycles of planning, acting observing and reflecting, with each of these activities being systematically and self-critically implemented and interrelated; thirdly, the project involves those responsible for the practice in each of the moments of the activity, widening participation in the project gradually to include others affected by the practice, and maintaining collaborative control of the process.

An aspect of action research which is highlighted by the above is that of participation. A crucial aspect of the methodology is the active involvement of all the participants. In this regard Grundy and Kemmis (1981:325) write about the participatory character of action research as follows:

> In action research, all actors involved in the research process are equal participants, and must be involved in every stage of the research. The research process cannot be planned outside the participant group and then 'handed over' for implementation and subsequent evaluation by an outsider.

Grundy and Kemmis (1981:325) link the requirement of collaboration in so far as, for them, "the participatory element of action research extends beyond individual participation ... to ... collaborative involvement".

Due to its reflective and collaborative character, action research can contribute to professional development in environmental education. Such qualities would include closing individual theory-practice gaps and the theory-practice gaps between individuals and social structures and relations (Robottom 1987). Like socially critical environmental education, action research adopts a politicised view and concerns itself with ideological critique. This means that educational action research regards the role of teachers' understandings as significant in the shaping of educational change (Walker 1988).

Another feature of action research is that it differs from "traditional research". In action research, researchers are not considered to be the "experts" who possess specific expertise to make the "right choices" for their "clients". Participants involved in action research would therefore not work according to rules established by experts, but rely on self-conscious analysis and development. Carr and Kemmis (1986:210) say of action research that "it challenges the 'expert' authority of academic educational researchers, and in education systems, it challenges bureaucratic authority in its notion of participatory control".

Action research in educational settings is therefore not an "objective" technique of doing research, but should rather be viewed as being situated within a critical paradigm of educational theory. In this model the essential feature is that it is committed to transformation (Grundy 1987:153-154). In the light of the above description, I decided on action research as an appropriate paradigm to employ for programme development, a decision clarified and reinforced by McKernan's assertion (1991:3), that action research can be used

> ... to solve the immediate and pressing problems of practitioners.

3.3 Three modes of action research

Shirley Grundy (1987) describes the three modes of action research - the "technical, practical and emancipatory", based on Habermas's three knowledge constitutive interests (Habermas 1972 in Grundy). McNiff (1988) goes further and describes the same three action research models as the scientific-technical action research model; the practical-deliberative action research model; and the critical emancipatory action research model. Without going into too much detail in distinguishing among the three models, it is nevertheless important to glance very briefly at action research in their light.

In the technical form of action research, the teacher is seen as a technician who practices what the outside "expert" has designed or prescribed. Technical action research, therefore, is product-orientated, aimed at efficient and effective practice (Carr and Kemmis 1986:202). It is not really concerned with the practitioners' understandings of their own practices and situations (Carr and Kemmis 1986) or with linking educational change to social transformation.

Practical action research promotes the development of the teachers' own understanding of situations, so that informed action can lead to improvement. In other words, it is phenomenologically based and, as such, takes the subjective experiences of the actor seriously. Carr and Kemmis (1986:203) contend that in practical action research

> participants monitor their own educational practices with the immediate aim of developing their practical judgement as individuals. Thus, the facilitator's role is ... to provide a sounding board against which practitioners may try out ideas and learn more about the reasons for their own action, as well as learning more about the process of self-reflection.

However, the experiences of the participants are not contextualised within an understanding of the power relations in society.

Emancipatory action research, by contrast, "promotes a critical consciousness which exhibits itself in political as well as practical action to promote change" (Grundy 1987:154). Further, according to Grundy (1987) the mode which is fully consistent with the principles of improvement and involvement is the 'emancipatory' mode. This mode of research is collaborative, involving all the participants as controllers of the research process. It is also about the democratisation of social situations and the purpose thereof would be to bring about change in a wider social context. According to Grundy (1982:358) in Kemmis and McTaggart (1988) emancipatory action research has as its purpose:

> the emancipation of participants in the action from the dictates of compulsions of tradition, precedent, habit, coercion, as well as from self-deception. In this it focuses ... upon ... the theoretical and organisational structures and social relations which support it.

Research which is informed by an emancipatory interest, has the potential to help teachers focus on the constraints under which they work and on the broader social effects of their work (Davidoff *et al* 1993).

Although action research has been categorised by means of the above three modes, Grundy (1987) warns that it is not always possible to identify a project as belonging to one particular mode. Instead, the three modes may sometimes be regarded as phases of a project. She also warns that "action research is not a formulaic methodology which, applied in any situation, will produce emancipatory practice" (ibid: 159). To regard it like that would be to imbue it with a technical interest which, through its interest in control, automatically denies emancipation.

In conclusion, it can be seen that action research (especially emancipatory action research) shares similar features with socially critical environmental education, as described in the previous chapter (section 2.3.3.1). I will now sketch the research process and later comment on the usefulness of action research as an appropriate approach in developing an environmental education programme, based on critical pedagogy.

3.4 Description of the research process

The following section provides a description of the research project, and gives an account of the action research cycles which developed during the study.

3.4.1 Setting the research scene

The research was carried out in the greater Cape Town area, Western Cape, in 1995 and 1996. I worked with secondary school teachers who had previously approached the Unit for environmental education programmes. Fifteen teachers from a range of schools (previously under the administration of the former House of Representatives and controlled by the Department of Education and Culture)[9] were invited to participate in the project. Some of these teachers, prior to the project, indicated that they did not know where to start environmental education and needed some assistance. All of us saw this project as an opportunity to develop our own understandings of environmental education and to, according to some of the teachers, "get to know what is happening in the field" (teacher DR). Most of the teachers visiting the Unit taught Biology and the participating group, therefore, consisted predominantly of Biology teachers.

All the teachers were either telephonically or personally

[9] This department was created as a result of racial segregation in the education system, in which each racial or ethnic group in South Africa was expected to attend its "own schools". The House of Representatives was created for the so-called coloured people.

approached regarding their willingness to participate in the study, whereupon the project proposal was described in detail to them. With the exception of three teachers, all of those approached indicated that they would like to be part of the project and were willing to be interviewed. Of the three unwilling teachers, one apparently was continuously involved with other school activities and in the end asked me to approach another teacher, the second teacher emphatically stated that he did not want to be part of decision-making processes, and the third teacher gave no reason for not wanting to be part of the project.

3.4.2 Data collection : The first cycle, first phase - identification of the problem

During the month of February 1995, the teachers who had agreed to be part of the study, were individually approached. I held preliminary meetings with them to provide background, discuss the research and to clarify uncertainties. Most teachers were initially scared to be interviewed, and a typical question they asked at the preliminary session was how they had to prepare for the interviews.

The first data collection method was semi-structured interviews. With these interviews the aim was to determine teachers' understanding and involvement of environmental education. The interview schedule is shown in appendix 1. All the interviews were completed at the beginning of April, 1995. This delay was caused by some interviews which had to be rescheduled due to unexpected meetings at schools where teachers were required. At one school, after a third visit, I still could not manage to interview that specific teacher.

The value of semi-structured interviews (Behr 1983, Burroughs 1975) was that it allows for flexibility. In his discussion on the methodology of action research Elliott (1981), in Flanagan *et al.* (1984), comments on the usefulness of semi-structured

interviews, contending that they allow the interviewees freedom to digress and raise their own concerns.

Throughout the study I kept a research diary, in which I recorded personal accounts of observations, feelings, reactions, interpretations and possible explanations for what happened (Kemmis and McTaggart 1988). Although the same authors recommend that all members of an action research group should keep a diary or journal, the teachers in this study were not asked to do so. I felt that in this study there was no reflection that was based on their (teachers') own practices and that collaborative reflection was more important for this kind of study. The participants however, received notes and letters summarising all the events and outcomes for them (see appendix 14). Although this could be regarded as a drawback in a participatory study, I address this concern later in sections 5.8 and 6.4.

3.4.3 Data collection : The first cycle, second phase - workshops

I decided on a follow-up workshop for the fourteen[10] teachers who indicated that they wished to continue their involvement with the project. The aim of the workshop was to discuss the outcomes of the semi-structured interviews and to plan action accordingly. Due to the limited availability of teachers, one of the constraints I faced in the study was the difficulty to plan activities which involved the teachers. This resulted in the first workshop only taking place on 17 June 1995, for one group, and a repeat workshop on 27 June 1995, for those who could not attend the previous one.

After the semi-structured interviews, I regarded the workshops as an opportunity to provide a situation where the synergy of the group would add to the depth and insight of the outcomes of the semi-structured interviews. The brainstorming techniques which

[10] Seventeen teachers were initially approached but only fourteen indicated that they wanted to be part of the project.

I used during the sessions were similar to that which Anderson (1990) described for focus groups. The workshops were introduced with a set agenda for two sessions. All the participants received a copy of the summary of the preliminary results of the interviews. The results were also presented on an overhead projector, to allow for comment and questions. Based on the results, two set questions were posed for group discussion. By using the above-mentioned interview results, participants had to list and prioritise the issues of concern they wanted to focus on in the programme; in the second session they had to suggest possible action to address those issues.

Ten people attended the first workshop, while six attended the second workshop held the following Saturday morning. During the workshop sessions, the groups divided into smaller groups consisting of three or four people. This allowed for greater interaction and participation by all present. Two teachers who had not been interviewed, but who had expressed a keen interest in the study, also attended. Teachers commented afterwards that they felt they had been able to speak openly about issues and problems related to education because they 'knew the facilitator' (Goliath, pers. comm. 1995).

3.4.4 Attending the 1995 EEASA conference (18-21 July 1995): The first cycle, third phase

During the first workshop, the participants identified that they needed teacher development programmes. The Environmental Education Association of Southern Africa (EEASA)[11] conference was seen as an opportunity to fulfil this need. Three of my EERU colleagues, seven teachers and myself attended the annual EEASA conference held from 18 to 21 July 1995 in Kwazulu-Natal[12]. At the conference the participating teachers had the opportunity to

[11] The Environmental Education Association of Southern Africa (EEASA) is an association which support environmental education through its publications, the annual conference and workshops, as well as with the activities of working groups in different regions in southern Africa.

[12] Shell South Africa sponsored the transport of the teachers.

sit in on and participate in various workshops. While some workshops focused on the concept of environmental education, others focused more on developments in the field of environmental education, for example, networking structures and available resources. For a copy of the programme see appendix 5.

Our meetings held during the conference, indicated to me that the teachers felt their conceptualisation of environmental education had broadened, and they requested a follow-up meeting or workshop to compare their views. We jointly decided to hold a meeting to reflect on the EEASA conference and to address our understanding of the concept of environmental education.

3.4.5 Reflection on the conference and planning the next step : The first cycle, fourth phase

In this session, held on 28 July 1995, the participants first reflected on the conference, re-visited their definition of environmental education and then decided on possible future action for the programme (see tables 4.7 and 4.8 in appendices 7.1 and 7.2 respectively). At this meeting we also did an activity taken from Huckle (1995b, WWF) and which focused on our understanding of environmental issues.

From amongst all the aspects related to possible action and which they wanted to focus on, the participants decided to start a small-scale project with interested teachers from their respective schools (see section 4.5.2). The participants wanted to draw these interested teachers into the project and run programmes for them in an Open Day workshop. The purpose of this Open Day was to help draw other teachers into the process, and to help them come to a better understanding of environmental education. Involving more teachers, the participants reasoned, would increase and support them in their environmental education initiatives at their respective schools.

The participants attended a special meeting on 25 August 1995 to

discuss the planned Open Day workshop and to report back on the number of interested teachers at their schools. Thirteen people, which included my three Unit colleagues and myself, attended this meeting. The participating teachers were very specific as to what they wanted for the Open Day. First of all, the participants proposed to have the Open Day at the EERU to introduce visiting teachers to the Unit. Further, from conversations at this meeting, I could detect that the participants were reluctant to decide on a specific date for the Open Day, raising all kinds of concerns, for example, holidays, difficult times for teachers, and so on. Eventually, 14 October 1995 (six weeks later) was accepted as the only time which would suit the participants and the other teachers.

As a group, we also decided that in order to bring other interested colleagues to a better understanding of environmental education we, the participating teachers, the two staff members and myself, would do presentations at the Open Day workshop. We decided to present interactive types of activities as opposed to lectures or talks. These presentations were also designed to give the participants in the project an opportunity to develop their newly emerging understanding of environmental education in a practical situation, (i.e. to share it with others).

The participants undertook to work in pairs. The topics which we decided to cover were:

- Introduction to environmental education (EERU staff member and myself);
- The "other side of Environmental Education" i.e. the social, political and economical aspect (teachers GA and SN);
- Integrating environmental education across the curriculum (teacher KH);
- A play and a talk to introduce the concept of sustainability (teacher ML and DF);
- A case study of one teacher (teacher CC);

- Possibilities in environmental education - i.e. competitions and games, developing resources and networking (teacher BF and HM);
- How to use an Environmental Education Centre (teacher CC);
- Problem-solving, cognition and environmental education (teacher DR);
- Viewing of resources and evaluation (Unit staff and myself).

Some of the teachers who had to do presentations proposed that we hold a trial workshop in order to evaluate ourselves and to ensure that what we were planning to present was the correct information. The trial workshop was held a week before the Open Day workshop (on 9 October 1995).

I sent letters to all the teachers, in which I summarized the outcomes of the last planning meeting to remind them of the trial meeting and the Open Day workshop. I also included copies of the letter of invitation that they had to give to the teachers whom they wanted to invite (the other interested teachers, see appendix 15). I offered the teachers the opportunity to plan their activity in close collaboration with myself or my colleagues at the Unit.

3.4.6 The Open Day presentations : The first cycle, action

Various difficulties were experienced in the time leading up to the workshop, from participants being absent from the planning meetings, to themselves and invited people unable to attend the Open Day. The workshop nevertheless took place. However, only three of the newly invited teachers (non-participants) attended the Open Day. Seven of the research participants (including one who had recently joined the group) did presentations. The five other participants (three of whom were regular participants) who had also committed themselves to do presentations were absent.

After the event, six participating teachers who had formed part

of the project right from the start, and who were present at the workshop, gave written comments on how the project should proceed and made recommendations for programme development for the Unit (see section 4.7.1).

3.4.7 Reflection : The end of the first cycle, start of second cycle

At this stage I felt it was necessary to have follow-up interviews with all the core participants, including those teachers who had not been present at the Open Day. I wanted to ascertain whether they still wanted to continue with the project, and why they felt some teachers had not attended the Open Day. I also wanted them to make recommendations[13] regarding environmental education and programme development at centres. These interviews were done telephonically (Anderson 1990) since this is a quick and economical research technique.

3.4.8 Planning meeting : The second cycle, phase one

At this time, October 1995, this research project still had to be written up for academic purposes. In addition, teachers were very occupied with their preparation for the impending final examination. I therefore felt that if we wanted to continue with the project, it probably would only happen in the following year. Then some of the participants started to contact me and had several comments about the process (see section 4.7.2). Some of them also felt that we should have a meeting before the beginning of the next year (1966), so that we could plan for when schools re-opened. A meeting was planned for 29 November 1995 but, due to the researcher taking ill, this meeting was postponed to 2 December 1995. Five teachers, an EERU staff member and myself attended this meeting. The results are reported in section 4.8.

[13] This was requested from the participants who had not attended the Open Day; those who had been present at the Open Day gave recommendations in written form.

3.4.9 A resources day at the Unit : The second cycle, phase two

At an informal meeting on 23 February 1996, at the EERU, the participants suggested that the project should proceed and they decided on various ways in which it had to happen (see section 4.9). One such decision was that participants should visit the Unit, explore its facilities and look at already existing worksheets.

Twelve of the participants attended the formal first meeting of 1996, which was held on 8 March at the Unit. At this meeting the participants wanted me to indicate how the Unit could assist them with the implementation of environmental education in the syllabus in each standard (level) of school. Despite them seeking assistance on how the Unit could help, they assured me that they were going to be pro-active in seeking ways in which they could implement environmental education in their specific lessons in each standard. One teacher withdrew herself from this process, stating that her immediate needs were to learn Xhosa in order to accommodate black students at her school with whom she had communication problems.

We planned on meeting at least once a month to exchange ideas and to compile a resource file with all our work. For a programme outline of this resource day, see appendix 11.

3.4.10 Presentation of the project at the 1996 EEASA conference, Stellenbosch : The second cycle, phase three

After the enthusiasm experienced at the 1995 EEASA conference, the participants then (during 1995) already proposed that this project had to be presented at the following years' conference. The 1996 annual EEASA conference and workshop took place from 9 to 12 July 1996 at Stellenbosch University. For a copy of the programme, see appendix 12.

Of the five participants who had indicated that they were going to the conference and jointly present the project, only three of the core group eventually attended. The three staff members who were part of the project also attended. Our presentation was attended by approximately 100 conference delegates. Although the participating teachers preferred me to do the presentation, they felt more comfortable and confident dealing with questions and discussion pertaining to the study.

This presentation marked the end of our group activities but some participants continued to work with the Unit individually. This led to additional outcomes of the research project (see section 4.11 and section 4.12.1) on how teachers experienced the project differently.

3.5 Data analysis

Miles and Huberman (1994) suggest specific tactics for drawing meaning from data, in order to verify the conclusions one reaches. In qualitative research, these tactics are important for confirming means, for avoiding bias and for assuring the quality of the conclusions. Based on Miles and Huberman (1994), I used the following techniques in the data analysis:

i. **Counting** This technique played an important part for me in identifying themes and patterns from the responses of participants to specific questions in the interviews and workshops.

ii. **Noting themes** I frequently used this technique, especially in the discussion parts of the project. I often noted recurring patterns and themes in the data.

iii. **Clustering** This technique was very useful in the grappling with the data. I also made use of diagrams to draw links between categories or clusters.

3.6 Validity

Validity, in general terms, refers to the trustworthiness or authenticity of a given study and its findings. To qualitative researchers, however, validity means much more than the traditionally defined positivist internal and external validity usually associated with the concept (Kincheloe 1991). Positivism has traditionally defined internal validity as the extent to which a researcher's observations and measurements are true descriptions of a particular reality. External validity has been defined as the degree to which such descriptions can be accurately compared to other groups (i.e. generalizability). Various categories of validity that are relevant to qualitative research have been proposed in the literature (see Miles and Huberman 1994, Maxwell 1992, Lather 1986). Drawn from this literature, the requirements for assessing validity as proposed by Lather (1986) offer a reconceptualisation of validity appropriate for an emancipatory approach to research, that is openly committed to a more just social order. I will only refer to these types of validity, which I found relevant to this study.

3.6.1 Triangulation

Triangulation is one of the most common methods of determining validity mentioned in the literature (Grundy and Kemmis 1981, Elliott 1981, Elliott 1984, Lather 1986). Lather (1986) feels that triangulation is critical in establishing data-trustworthiness. Triangulation involves gathering accounts of a situation from three quite different points of view. This method brings different kinds of evidence into some relationship with each other, so that they can be compared and contrasted (Elliott 1981).

Triangulation in my action research facilitation has been with the assistance of my EERU colleagues, who sat in on all the meetings and workshops as participant observers (Elliott 1984). After each meeting, they made comments about the process, teacher

responses and their own observations. At the start of each subsequent meeting, the teacher participants were presented with my summary of the previous meeting or workshop, which afforded them the opportunity to comment on whether I had interpreted everything accurately. Another means of triangulation has been in the form of the feedback I received on an informal basis from the teachers (through conversation).

3.6.2 Face validity

Face validity is described as the process of going back to the participants with the tentative results, and refining them in the light of the participants' responses (Reason and Rowan 1981 in Lather 1986). I employed face validity by discussing the outcomes of the project with some of the participants, especially those who displayed more interest in the project[14].

However, one of the drawbacks I faced in attempting to utilise this type of validity during the writing of the thesis, was the time constraint. As a consequence, I was unable to give written parts of the research document to the participants. However, I felt this did not impact on the validity of the study overall, for I believed that the other forms of validity were sufficient.

3.6.3 Catalytic validity

According to Lather (1986:272) catalytic validity represents the "degree to which the process re-orientates, focuses, and energizes participants towards knowing reality in order to transform it." Freire (1973) termed the same notion conscientization, which is the 'measure' of the extent to which the participants have gained self-understanding and, ultimately, self-determination through research participation.

[14] For example, they were more involved in the project through their interest in the writing of the project and through their commitment to remain part of the project throughout.

I perceived the following as examples of catalytic validity in this study:

- One of the teachers who had initially felt that the socio-economic problems at her school were too enormous to surmount, and that she therefore could not continue to participate in environmental education projects, afterwards started to participate actively by involving those same pupils in activities at the Unit. This involvement included, for example, bringing pupils for life-skill workshops, where they were taught how to propagate their own plants. I related this to a better understanding of environmental education by the teacher.

- One of the participants enrolled for a B.Ed. course at the University of Stellenbosch at the beginning of 1996, in which she chose to include an environmental education module. After passing her course, she indicated that she would like to continue with further studies in environmental education.

- Participants in the study started to visit the EERU on their own accord, using the resources and asking to be kept informed of the latest developments in the field, for example, by wanting to stay abreast with the publication of new resources.

- My three EERU colleagues (the participant observers) hosted a workshop for teachers on Arbor Day activities. The workshop hosted was based on similar principles as in the study, namely, identifying a problem and taking action to improve a situation. This Arbor Day workshop was aimed at assisting teachers to do their own Arbor Day activities, instead of being reliant on centre staff to do it for them.

- One of the participants in the study started to involve more people at his school in environmental education.

Eighteen plots at his school were develop for indigenous plants, with individual classes taking responsibility for each plot. The Unit assisted him with this.

- This same teacher also commented on how his experience in this project helped him to come to a better understanding of environmental education. He said he felt more confident when he took school groups and teachers on excursions.

- Instead of acting on invitations to meetings, some participants started to contact me or members of the Unit on their own to discuss the potential of the EERU. They also made recommendations on how the Unit could be utilized more effectively.

CHAPTER 4

RESULTS AND OUTCOMES OF THE STUDY

4.1 Introduction

My work with teachers who bring school groups to the EERU has revealed that teachers find it difficult to participate actively in, or run, programmes for their pupils. Some of them have, indeed, directly expressed a need for guidance in environmental education. In this study, the aim was therefore to jointly develop programmes for the Centre which could be of benefit to the teachers, and which would help both them and the staff at the Centre come to a better understanding of environmental education. Consequently, the next stage of the research was conceptualised as the first cycle, first phase : Joint clarification of the problem.

4.1.1 Joint clarification of the problem : The first cycle, first phase

This phase in the action research cycle consisted of a semi-structured interview and workshops. It was also aimed at exploring the participants' understanding of environmental education, as well as their perceptions of centres and whether they wanted to be involved in programme development. This information was to serve as background to, and the start of, the participatory action research project. The semi-structured interview schedule used is presented in Appendix 1. In the first section of this chapter I provide the results of these initial semi-structured interviews.

4.1.2 General comments and observations on the semi-structured interviews

All the teachers initially felt uncomfortable about speaking into a tape-recorder. I therefore had to make notes during the first

interviews. This may have been related to the fact that they felt a lack of confidence and were uncertain about being questioned on environmental education.

The teachers used the interview as an opportunity to air their general concerns and problems they experienced in teaching. The interviews therefore took longer than I had anticipated. Interviewees mentioned various factors, for example the poor socio-economic conditions where the school was situated; gangsterism and vandalism at school; overcrowded classes; them being overworked and working with children who are apathetic; lack of enthusiasm from other teachers who "just teach" and are not interested in educational innovation; past teacher strikes which changed teachers' attitudes. Retrenchments were also influencing teachers' work in the sense that they felt demotivated to initiate projects because of uncertainties.

To illustrate the above I quote two teachers who said the following:

Teacher JO ~ "our school does not always have the apparatus, eg. a video machine, and so it is difficult to plan or even do the easiest task."
Teacher DR ~ "we do not have fancy equipment like overhead projectors ... even our light fittings on the ceiling get stolen".

4.2 Outcomes of the semi-structured interviews

The following sections reflect the responses of the teachers to the questions as outlined in the semi-structured interview schedule in appendix 1.

4.2.1 Teachers' involvement in and understanding of environmental education

All fifteen teachers that I interviewed stated that they were

"doing environmental education"[15]. Exactly what their understanding of "doing environment education" entailed is graphically illustrated by the list of activities in table 4.1 in appendix 2.1. For example, the activity listed most frequently by the interviewees as an illustration of their environmental education practice, is going on excursions to either an environmental education centre or taking pupils into nature. Other activities mentioned related to teaching about ecology and awareness about the environment; their involvement in recycling initiatives; running litter awareness campaigns; teaching about values and responsibility; and making links between environmental and social issues. Without being questioned about it, five teachers added that it was because they themselves felt that the syllabus is too "limited" that they decided to take it upon themselves to do the environmental activities.

It was my assumption at the time of doing the interviews that teachers' practice would be related to their understanding of environmental education. Interviewees' understanding of what is meant by "environmental education" were therefore explored. Their responses are summarised in table 4.2 in appendix 2.2.

Most interviewees had a limited understanding of environmental education, by which I mean an understanding of the concept environment as referring to nature (the biophysical) only. This would explain why their environmental education is characterised by teaching *in* and *about* the environment (see Chapter 2, section 2.3.2 and 2.3.3). Table 4.2 (appendix 2.2) also shows, however, that some teachers did have a broader understanding of environmental education. While three of them mentioned that it included a social component with people being a part of the environment, two others made the connection between social, economic and biophysical components.

[15] Note: Interviewees were chosen on the basis of their apparent interest in environmental education as evident from their visits and enquiries to the centre.

4.2.2 Problems teachers experience in teaching environmental education and assistance required

In an effort to establish some common ground from which to embark on the project, interviewees were then asked to mention the problems they have in teaching environmental education. The results are depicted in table 4.3 (appendix 2.3).

The results indicated that out of the four teachers who said they did not have a problem with teaching environmental education, three regarded it as part of Biology or the syllabus (as ecology), while the last one regarded it as an integral part of the syllabus. For me, this outcome could be related to teachers' understanding of environmental education. The group who did report problems, most frequently mentioned factors associated with excursions. Teachers also mentioned frequently (5 times) the lack of teacher development programmes and the syllabus, which was seen to be too full and exam-orientated, leaving no room for environmental education. Some teachers referred to education which is period-based (teacher LP), that the syllabi are biased in what needs to be taught (teacher CA) and that teachers were guided by syllabi, which did not allow for environmental education to be taught.

The support teachers required to assist them in teaching environmental education, and to overcome their problems, generally corresponded with the problems they mentioned. The assistance most frequently mentioned (six times) was teacher educational programmes; followed by the need to make other teachers at their school, "not only Biology teachers", but also aware of environmental education. Other responses less frequently mentioned are presented in table 4.4 in appendix 2.4.

4.2.3 Teachers' expectations of centres

In the light of the project's goal of programme development at the Unit, I regarded it as necessary to determine what teachers'

expectations of centres were in order to help guide the process. Table 4.5 in appendix 2.5 shows that seven participating teachers felt that they needed information on centres and what was available there. Centres, they felt, must also provide resources (such as books, magazines, posters, and videos) to teachers. Interestingly, five teachers also mentioned that they wanted centres to run programmes for children. Perhaps this can be related to the point raised in the introduction, that teachers wanted centres to do programmes for them, because they did not feel comfortable about doing it themselves. See table 4.5 for other responses to this interview item.

4.2.4 Interviewees responses to doing and planning environmental education programmes at centres

The next question dealt with whether teachers should plan and run their own programmes at centres. With hindsight, I do not think that I could deduce much from the teachers' responses to this question. One should keep in mind that at this early stage of the research many teachers were still very uncertain about environmental education, and this uncertainty could have influenced their response to this question. They expressed mixed feelings when I questioned them about doing their own programmes with their pupils at centres (Item 8, appendix 1). Those in favour of teachers running programmes at centres themselves, felt that teachers would know better what their pupils need to know. However, they said teachers would only run their own programmes if they had the necessary knowledge on how to do programmes and had information about centres (eg. a brochure or self-guide). Those against doing their own programmes at centres felt that children listened better if someone else, other than their teacher, spoke to them. They also said that teachers were not familiar with the "set-up" at centres and that centre staff are better equipped to do programmes. To me, this indicates that there were those teachers who wanted to do things for themselves, but needed guidance, as opposed to others who merely said that it would be better for someone else to do the work.

Although ten teachers felt they would prefer the centre to do environmental programmes for them, all teachers felt that they should have a role in the design of programmes at centres. This clearly indicated that the concerns of the study were relevant to teachers. Reasons for this response were that teachers felt they knew what important aspects in the syllabus should be related to environmental education (six teachers). Others felt they knew "where the children are in their development" (meaning they have a better understanding of the children) and would therefore be in a better position to decide on the nature of programmes for children. Lastly, some felt it would be necessary for teachers in general to be part of programme design so that teachers could feel a sense of ownership and therefore feel more confident to use programmes. Others gave no reason why they felt teachers should be part of the design of programmes at centres.

The reason most frequently mentioned by teachers for not feeling equipped to do their own programmes was that they felt they needed background or a course in environmental education (eleven teachers mentioned this). They felt their knowledge was limited and they had not received the relevant information in their teacher professional development programmes. Others felt "intimidated" and "scared" and felt the "expert" at the centre could more successfully do such programmes for the teachers.

With the exception of two teachers, the interviewees all said they wanted to be part of the process to address the issue of programme development (i.e. for this study). One teacher felt that he did not want to be part of decision-making but was only interested in acquiring information. Another teacher said that her knowledge was too limited to inform others about their own centres ("experts know their own centres"). Those teachers who indicated that they would like to be involved in the process, mentioned that time was a factor to consider, meaning that they might not always be available to participate in this study.

The results of this first data collection activity clearly

indicated the relevance of the research to the teachers; however, it also highlighted possible constraints on the study, such as the limited time teachers had available for the study and their overall lack of confidence.

4.2.5 In summary

By interviewing the teachers, as reported in this section, I came to a better understanding of how teachers understood environmental education. The interviewees also provided me with a very good background to the circumstances of teachers at schools. Despite problems teachers experience, most of the interviewees in the study showed a sense of commitment to environmental education, and indicated that they would like to be involved in programme development.

The outcomes of the semi-structured interviews determined, to a large extent, how the next step - a workshop - would proceed. At these workshops we would discuss the outcomes of the semi-structured interviews in order to further clarify the problems encountered and raised, and decide on possible actions in order to remedy these.

4.3. Further clarification and planning action : The first cycle, second phase

This clarification phase consisted of workshops to identify issues to focus on and to decide on possible action.

4.3.1 Introduction

It was difficult to find a date for the workshop which would suit all the teachers who wanted to participate. As I regarded this first workshop as an important one, I decided that the same workshop should be repeated, on different days, so as to accommodate more participating teachers. For details about attendance and dates refer to Chapter 3, section 3.4.3.

4.3.2 Workshop proceedings

The participating teachers engaged in small group discussions after I had presented the results from the semi-structured interviews and the description of the action-research cycles and methods. The results of the semi-structured interviews, as I presented them, were summarised in the key points (see appendix 3).

In contrast to the first individual interviews, teachers felt far more comfortable about being recorded during the workshop discussions. During the workshops, I also noted that small discussion groups, consisting of three to four people, allowed for greater interaction and for all the participants to contribute to the discussions. The main outcomes of the workshops pertaining to this study are reflected in table 4.6 (appendix 4).

4.3.3 Outcomes of the first workshops

I discuss the main outcomes of the first workshops in the following three sections.

4.3.3.1 Availability of teachers

An emerging issue was the influence of factors which limited teachers' availability to participate in the research. These factors included examinations, marking periods, holidays and other social events. This time limitation frustrated me, because I felt it placed a serious constraint on the study. As the facilitator working towards a thesis deadline, I felt that the cycle appeared to proceed too slowly. The workshops, for example, were held six weeks after the semi-structured interviews were completed.

4.3.3.2 The issues to be addressed

The issues emerging from the first group discussions, and in which the teachers prioritised the main issues to address in the context of the study, are presented in the top row of table 4.6, appendix 4.

The two main issues that were highlighted most frequently by the teachers were firstly, teacher development, which was mentioned by four groups and listed by most of these five groups as the issue to receive priority. Secondly, the fact that environmental education was not yet part of the syllabus was regarded as a problem.

4.3.3.3 Actions to take

In the second half of each workshop, participants looked at ways of addressing the above issues (i.e. suggested plans of action for this study). The results of this activity are presented in the bottom row of table 4.6, appendix 4. Group 2a felt that the issues they had listed were interrelated and therefore suggested an integrated plan of action. With no exception, all groups identified a need for teacher development programmes. As part of teacher development, they suggested "skills workshops", for example. Activities to draw more teachers into the programme were also suggested. Groups 1a, 1b and 2c suggested that the "Unit should go out more to the schools" or work more closely with individual schools (group 1a). In discussions it transpired that the idea behind a centre going to schools was so that people can realize that the environment is not far removed (i.e. in a nature reserve) but "around you" (i.e. also at school). The Unit should therefore help to raise awareness (among teachers, parents and pupils) of the environment in the local community where the schools are. This indicated to me how some participants already had a broader understanding of the environment. This understanding also reflected differences in the teachers' thinking about environmental education. Three groups further

highlighted that the Unit should function as a resource for teachers. Other participants (group 1a), suggested that the Unit should have some input into the changing of the syllabus.

Some teachers in this study felt strongly that environmental education had to become part of an examinable course. Others, though, indicated that they felt it had to become part of all subjects. The latter group's view reflects the multidisciplinary approach to environmental education recommended by UNESCO-UNEP (1978). The result shows that some teachers were beginning to recognise the integrated nature of environmental education. This evidence was also supported by their request to also have other teachers involved in the study (not only the Biology and Science teachers).

In the light of the above results, which strongly advised teacher development programmes, we decided as a group to attend the 1995 EEASA conference which, it was felt, could help with improving and broadening our understanding of environmental education, especially in terms of critical praxis.

4.4 Attending the 1995 EEASA conference - "A Moment in the research" : The first cycle, third phase

This section outlines the participants' experiences of the conference and their understanding of environmental education was influenced by attending the conference.

4.4.1 The conference

I used the first workshop (see section 4.3.2) as an opportunity to inform the teachers of an environmental education conference to be hosted by the Environmental Education Association of Southern Africa (EEASA). With their attendance at this conference, I was hoping to introduce them to as many activities in the field as possible since, in the words of teacher DF, they wanted to "learn more of what is happening in the field of

environmental education". See appendix 5 for a copy of the 1995 EEASA conference programme.

At the conference teachers made notes which were later summarized in brief reports (See appendices 6.1 - 6.7). The data here is drawn from these written feedback reports, my observations and the informal talks we had during the conference.

From the reports it was clear that participants attended mostly those sessions which could help them with their understanding of environmental education and those which could give them ideas on how to practically implement environmental education in their teaching. I could sense that they wanted to attend as many activities as possible, in order to learn as much as possible. In fact, several teachers reported being frustrated about not being able to attend more sessions (sessions were presented in parallel).

During the conference I became aware of the ongoing, spontaneous discussions on environmental education among this group of teachers. The discussions, initiated by themselves, generally dealt with aspects of the conference or workshop sessions, such as new concepts they might have come across[16]. These discussions, and the spirit of camaraderie which started to develop, led to them organising themselves into a 'teachers forum'. One teacher commented that as a group (forum) they work well together, and in the future it would be easier to help each other with the implementation of environmental education. This links well with their need for support identified earlier (section 4.2.2, tables 4.3, 4.4 and 4.6).

In one of the planned meetings I had with the participating teachers during the conference (to discuss the events), the teachers asked for a meeting to be held soon after the conference. The reason they gave was that their "concept of

[16] Note: the teachers did not know each other before the start of the study, except for two who taught at the same school.

environmental education has broadened" (teacher DF) and they wanted to get together to compare how they each had experienced the conference and what they had learnt from it. Some of the comments teachers made in their written reports on the conference to illustrate this better understanding, are :

> The conference ... has broadened my scope of Environmental Education. Previously, I think I was quite narrow in my views and now feel better equipped to deal with Environmental Education (teacher BF),

and

> ... my perception broadened ... how social, economic and political aspects also play a role in the environment. I have never thought about EE in this way (teacher CA).

In general, the teachers who had attended the conference said they had enjoyed being part of it, especially because they felt they could interact with others and they could get exposed to a range of ideas, perspectives and experiences of people involved in environmental education.

4.4.2. Themes arising from the report back on the EEASA conference

I report on the following three themes which emerged from attending the 1995 EEASA conference.

4.4.2.1. Teachers' comments on their understanding of environmental education after the 1995 EEASA conference

The first outstanding result obtained from my informal talks with the teachers who had attended the conference and from their individual reports, is that they all indicated they had experienced a change in their understanding of environmental education. The only exception was one teacher who already had

a broadened understanding of environmental education. To illustrate this new understanding, teacher (CA) stated that his

> ...perception of Environmental Education was very narrow. The basic idea I had was that EE was about teaching people about the biotic components, how they integrate it, and how they identify it.

He further stated that after the first workshop of the conference

> ...my perception broadened...how social, economic and political aspects also play a role in the environment.

In this "broadened" understanding of environmental education several teachers mentioned that they now understood :

i) the role of social, economic and political factors in environmental issues (teachers CA, DR, DF);

ii) the role of environmental education in addressing social, economic and political problems : "Now I can understand better how recycling, gangsterism, etc. fits in with EE" (teacher CA); "...the impact environmental education has...and its pivotal influences on the economy and politics" (teacher DR); and that "...the environment is in the people and that it shouldn't be taken away from the people..." (teacher DF);

iii) that environmental education is not simply for children, but for adults and educators too : "...my perception now includes the education of the educator..." (teacher HM).

4.4.2.2. Addressing the need for practical examples in environmental education

Generally the participants regarded the conference as a learning experience, but felt opposed towards what they called "academic jargon" and said that some workshops were far too "theoretical and intellectual" (teacher BF). They stressed the need for

"hands-on" experiences.

For other participating teachers, however, the need for practical examples on how to do environmental education had, to some extent, been met by the conference. This was reflected in statements from the reports : "I got good ideas on how to implement EE with children" and certain workshops had "shown teachers how to teach EE in a very real and practical way" (teacher KH).

4.4.2.3. Teachers who attended the conference : Experiencing motivation

Some of the participating teachers who were already involved in environmental education projects reported that the conference helped them in coming to a better understanding of how to approach environmental education differently. Teacher CC reported: "The conference was very motivating. I started to feel as if I could start all over." Another teacher who, in our first workshop felt that socio-economic problems first had to be overcome before one could do environmental education, stated after attending a workshop on environmental education in poor communities:

> ...I allowed myself to become despondent because of the community I teach in. This workshop gave me the courage to carry on again....The lesson learnt is not to give up, but to carry on. (teacher ML)

Teacher ML further noted "...I was motivated and encouraged to start projects which I never even thought I would have started on my own" and DF said "...(the conference) inspired me and gave me hope for the future."

From these quotations it is clear that the participating teachers who attended the EEASA 1995 conference found it inspirational and encouraging. They felt a motivation towards renewed environmental education action.

4.5 Reflection on the EEASA conference and planning the next phase : The first cycle, fourth phase

The workshop in this phase consisted of two parts, namely reflection and planning. I report on both in the sections below.

4.5.1 Reflection meeting on the conference

This meeting was held one week after the 1995 EEASA conference. The meeting was attended by teachers who had attended the EEASA conference as well as those who had not but still wanted to remain part of the project.

4.5.1.1 Differences in participating teachers' understanding of environmental education

I noticed a difference in the understanding of environmental education between teachers who attended the conference and those who did not. The better understandings of environmental education of those teachers who had attended the EEASA 1995 conference, is reflected in appendix 7.1, table 4.7 (and section 4.4.2.1). In contrast, the responses of those teachers who had not attended the conference (appendix 7.2, table 4.8) tended to focus on conservation, protection and awareness raising for a harmonious co-existence between people, animals and the environment.

Part of this reflective workshop consisted of an additional exercise to determine the teachers' understanding of the environment through their views on the environmental crisis (eg. causes and basic problems). This activity was adopted from Huckle (1995b). See table 4.9 in appendix 8, for the result of this activity. It was interesting to note that the four teachers who had not attended the conference, all blamed individuals for the environmental problems of the world, whilst the majority of those who had attended the conference blamed social structures.

4.5.1.2 Comments on the EEASA conference attended

It is difficult to explain the eagerness[17] of this group of teachers to attend the 1995 EEASA conference, but their commitment to environmental education was demonstrated by their active engagement at the conference and by them wanting to attend as many sessions as possible. These acts also confirmed their need for teacher development programmes. One can speculate that "committed" teachers would participate in similar activities which could enhance their understanding of environmental education, if only they are aware of such events taking place. The participants in the study, for example, had not previously known about EEASA and its activities. This may be a confirmation of Spork's (1992) findings that teachers' complaints about the lack of resources could perhaps be related to them not knowing what is actually available.

4.5.2 Planning the next phase and individual teacher meetings

The second part of the workshop was spent planning the next phase in this action research cycle. At this stage of the research it became difficult to distinguish between cycles and spirals in the study (i.e. when the one cycle ended and when the other started).

The participants then decided what they wanted to focus on. These were :i) addressing the syllabus, and ii) initiating staff (teachers) development programmes. Teachers felt they first wanted to determine how the syllabus was going to change (with the new proposed curriculum) before they could inform centres, about their (teachers') needs with regard to changes. One teacher disagreed however, and felt that too much emphasis was being placed on the syllabus which "should only be there for guidance" (teacher DF).

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[17]The teachers could have seen this as an opportunity to be away from school during normal school hours. Also, the conference was held in Durban, and it could have been seen as an opportunity to go there.

Secondly, they felt that the proposed staff development programmes should involve other teachers as well. Suggested activities included teacher excursions, workshops to introduce environmental education, presenting talks at schools to teachers and working with small groups of interested teachers.
The comments made during the meeting indicated that the participants first wanted to determine what their respective school communities needed before they could approach the Unit with specific recommendations for staff and programme development. They referred to a "needs assessment" to be carried out at their schools, i.e. to identify those teachers who would be interested in environmental education. The participating teachers did not mind if the project had to start on a small scale and only later involved more teachers.

The role of the principal was also mentioned. Teachers commented that the role the principal contributed to the degree of ease or difficulty with which they would be able to do environmental education. They felt it was easier for them to do environmental education if their principal supported them. One teacher explained that her principal was rude to teachers, behaved totally undemocratically, had his favourites and gave little acknowledgement or encouragement to those he did not like.

For the purpose of the project, an Open Day workshop was decided on (see appendix 9.1). The participating teachers were very specific as to what they wanted for the Open Day. First of all, the participants proposed to have the workshop at the EERU to introduce visiting teachers to the Unit. A one day event was suggested as more appropriate for the teachers who were going to join the project (see section 3.4.5).

At this stage of the project, I developed some difficulties with participating teachers. Some of the teachers appeared to be reluctant to do the presentations. They gave various reasons, from having other commitments to the time period being a difficult one. Another participant, for example, asked that we

postpone the workshop to the first week of school of the following year (i.e. 3 months later). After the trial workshop I also learnt that three people had forgotten about the meeting, or had other activities planned. Some teachers complained afterwards that it was difficult to work in pairs and they lived far apart. In a separate meeting I held with one teacher, I learned from him why teachers were probably reluctant to participate at this stage. In our meeting, he mentioned that the practical implementation of environmental education was still difficult and that environmental education was extra work for teachers, and not part of examinations.

At this stage of the study, there were ten core participants and three other regular visiting teachers. Despite the concerns that some teachers raised regarding not wanting to do the Open Day, six of the core participants and three of the other teachers wanted to go ahead with the presentations at the Open Day. Amongst those who wanted to do presentations, there were two core members who did not attend the 1995 EEASA conference. Eventually, just before the Open Day had to take place, four core participants and two of the other regular visiting teachers (who did not attend the 1995 EEASA conference) indicated that they would not do presentations at the Open Day.

Four of those who cancelled their presentations had not attended the EEASA conference and did not always attend all the meetings in the study. I suspected that they lacked some confidence to do presentations on environmental education. One of the core participants could not be present due to a seriously ill relative (her father).

4.6 The Open Day workshop : The second cycle, action

4.6.1 Attendance

Only three additional people (invited teachers) attended the workshop. There are numerous possible reasons for this poor

turnout, ranging from teachers not having been invited in good time to a number of other activities taking place elsewhere simultaneously, which took priority. However, whatever the reason, I think the perception of one teacher who said to me "teachers are funny, they would rather go to a carnival, than attend a workshop" was quite accurate. This is borne out by a later comment from another participating teacher that he felt, in general, teachers "are just lazy" and that they could have attended the workshop if they had wanted to. It was, however, difficult for me to determine whether the participating (forum) teachers had actually invited their colleagues to the workshop.

4.6.2 Open Day workshop proceedings

Seven participating teachers (including the two who had not attended the EEASA conference) and myself did the presentations. The proceedings of the workshop appear in appendix 9.2.

4.6.3 Comments on the Open Day workshop

The Open Day workshop demonstrated that the participating teachers found it difficult to put their knowledge into action. They thus presented a very theoretical workshop, which indicated that they could use the theory; however, they seemed to find it difficult to progress beyond this stage. In addition, most of their ideas were taken from the 1995 EEASA conference or from resources at the Unit. In one case, for example, two presenters took ideas from resources at the Unit and applied them uncritically, not using them in an integrated manner.

The reason for this, it appeared to me, was that when the participants realized that they had to prepare some work, they started to feel that environmental education was not a priority. This perception is substantiated somewhat by an admission of this nature from one of the participants during a discussion before the workshop. Furthermore, the participating teachers mentioned all sorts of difficulties they had experienced when they had to

plan for the Open Day workshop. They also felt that they could not spend too much time on the preparation.

In the final analysis, therefore, it appears that it was easier for them to borrow ideas from the recently attended EEASA conference than to make the effort themselves. This echoed the old story: if time becomes a problem for teachers, it is easy to leave environmental education out of their work. However, it must be admitted that leaving environmental education out could also be related to the fact that it is not a prescribed part of the syllabus.

In a project of this kind it appears that teachers work under various constraints which should be kept in mind when planning, for example, fund-raising events, and sport and cultural events. It therefore becomes difficult for teachers to plan events, like this workshop, well in advance. Another constraint (specifically mentioned) was the time of the year. Teachers in this study felt that the term (which they referred to as the third term) was a difficult one, with too many activities. Some suggested that we plan short meetings and events after school (on weekdays only) or during school hours.

4.7 Reflection : End of cycle one, start of cycle two

I could not get all the core participants to reflect on the study during the Open Day meeting because not all of them were present. This phase consisted of written and telephonic responses.

4.7.1 Written reflection

The most profound impressions I gained from the Open Day were, firstly, how difficult teachers seemed to find it to do environmental education and, secondly, how difficult they seemed to find it to participate regularly in an action research project. Following this Open Day, I therefore asked the participating teachers to describe in some detail the

difficulties they experience in doing environmental education, with special reference to our project, and to give recommendations for programme development at the Unit. Such recommendations, it seemed, would be useful for teacher development programmes in environmental education in general.

Both the teachers who had been invited to attend the workshop and the participants wrote down their responses to these questions, which are summarised in tables 4.10 and 4.11 in appendices 10.1 and 10.2 respectively. This time all the participants highlighted the eduction system as presenting problems for practice of environmental education (eg. subjects are too compartmentalised). Related to the education system, was the difficulty teachers experience due to environmental education not being part of the prescribed syllabus.

The recommendations these same participants made on how the Unit could contribute to the effective implementation of environmental education are presented in table 4.11.

4.7.2 Further Reflection : Interviews

This reflective phase of the research, designed to explore the teachers' reasons for absence from the Open Day workshop and to determine their further involvement in the project, revealed a host of reasons why it had been difficult for them and others to participate in the Open Day. Most of these reasons had to do with inadequate **time** to attend, for example:

- three participants had other commitments and activities on that particular day;
- one teacher mentioned that week-ends were generally a difficult time to organise events for teachers, because not all teachers are prepared to engage in activities outside working hours;
- four participants felt that it was a difficult time of the year for teachers to attend any workshop, and one

teacher thought that they had been "shortsighted" when they had planned the Day (meaning that they had not thought about how the rest of the term was going to proceed).

The issue of 'time' thus constituted the major reason given by teachers for the poor attendance. However, two other reasons also seemed important. Two interviewees (who did not present at the Open Day) said that a lack of confidence could, to some extent, have prevented them from doing a presentation at the Open Day. Furthermore, others who did not do presentations, added that with only few people showing an interest, it made them despondent because "people in general are not aware of the importance of environmental education".

In response to my question to participating teachers as to how such a project could be run better, they generally commented on their needs and the nature of such a programme. This information is provided here because it provides additional information to that reflected in table 4.11. They wanted:

- an environmental education programme to be practical, giving them "direct guidelines" on how to do activities and booklets, worksheets, information on what is available for use in environmental education (most frequently mentioned);
- more contact between the Unit and the teachers; and the Unit to be promoted to other schools through more frequent visits to such schools;
- the Unit to start with programmes early in the year and to run programmes during school hours;
- the Unit to keep them informed of the latest developments and new ideas in the field of environmental education;
- environmental education programmes presented to be linked to the new continuous evaluation system in schools;
- the Unit to motivate more people and to inform them what environmental education is;
- environmental programmes which are more "alive as opposed

to theoretical", eg. environmental plays or slide-shows;
- environmental education programmes to include teacher development programmes;
- more networking between teachers with regard to environmental education.

These often excellent suggestions indicated that teachers became very specific about the nature of programmes to address their needs. All ten teachers interviewed confirmed that they wanted to continue their involvement in the project. Two teachers intended doing full-time studies the following year but they still wanted to stay abreast of developments in the project and be part of it.

Of those who wanted to remain involved in the project in future, one expressed a need for more talks and workshops, another for more assistance to support teaching, while two participants suggested that the forum had to meet before the next year to plan the programme. In response to the last request, I decided to have a planning meeting before the next year in order to plan the way forward.

4.8 Planning meeting : Second cycle, phase one

This meeting took place during the last week of the school year, and many of the teachers were finishing off tasks related to the examinations. This could possibly explain the low teacher attendance (five participants) although other possible reasons (such as those raised in section 4.7.2) did enter my mind.

Nonetheless, there was a positive response to my suggestion that teachers should start to take initiative in, and ownership of, the project. After reviewing the whole process in the project, the cycles in the action research spiral and their outcomes, participants present in this meeting made the following comments:

- the teacher development programme of 1995 had been "too

theoretical" and the 1996 programme should be more "practical", for example, "how to use...eg. an area, a nature reserve, or a resource." They felt practical work would also build confidence;

- the core group should continue and learn from each other and others;

- the role of the Unit should be de-emphasized, the focus should rather be on groups and others as resources; they should rather learn from each other, eg. how to lead their own groups through a learning experience at the Unit;

- the role of the Unit should rather be to assist the teachers, eg. with the production of teaching resources;

- It was sometimes impractical to take pupils to centres like the Unit (eg. large groups) so teachers should rather learn to use their own environment;

- the environmental educators of the Unit should keep teachers informed of what is happening (especially "outside" in the field of environmental educators);

- environmental education should be a stimulus for a new way of teaching; teachers needed to know how to make environmental education part of the changes in teaching, eg. how it fits in with continuous evaluation;

- those present felt they wanted to be part of policy-making and they suggested that the Unit could possibly represent the teachers;

- environmental educators should be aware of the changes in teaching and the problems associated with teaching;

- the education department should grant teachers permission

to work on aspects in environmental education (eg. two chapters in a textbook) and this information can then be made available to other teachers;

- projects might start on a small scale, working with a small groups of teachers and then "going out" and showing others what has been achieved ("teachers want to see something");

- programmes designed should be relevant to the teachers and of interest to them;

- we should link with teacher resource centres to see what they are doing, and perhaps the concepts they apply could be used.

Despite this range of suggestions, the group could not decide on a plan of action. They felt that we should involve the whole group ("get everyone together") to decide on a plan of action. It was suggested, however, that whatever strategy was followed, we need to focus on practical examples and specific regions (eg. Kuils River) when aspects in environmental education are dealt with.

This meeting, which was held at the request of the participating teachers in order to plan for the following year, was the first time they had started to take initiative to guide the research process. It marked a change in the project, from the teachers being the passive recipients of my initiative, to a wish for themselves to become involved, not just in the project, but also in developments in environmental education. For example, they suggested they should develop their own resources with the assistance of the Unit, they wanted to have an input in policy-making and they wanted to stay informed of what was happening in environmental education broadly. Those present were optimistic that environmental education could enrich teaching ("provide a stimulus for a new way of teaching"), but there were still conceptual problems for most teachers, and environmental

education, according to them, needed to be "demystified".

4.9 A resource day at the Unit : Second cycle, phase two

At an informal meeting held early the following year, on 23 February 1996, the group decided that they would like the project to proceed as follows:

- As a forum we were going to develop a resource file which would contain all the practical information of activities that had been successfully tried at schools. The resource file would be housed at the Unit, so that others could draw on it or consult it;

- As a forum we were going to work in groups to determine how continuous evaluation and environmental education could be linked to the syllabus. Each group would tackle a specific standard (level);

- The individual teachers would continue working with the Unit on an individual basis.

One teacher withdrew herself from the above decisions, stating that she no longer had the time to participate actively in the project. With the intake of black students at her school, she had become involved in extra classes and with learning Xhosa.

It was also at this informal meeting that the participants asked for an exploration day of the Unit, i.e. a guided walk in the reserve in order to look at possibilities of how the Unit and its reserve could be used by them, and to have a look at worksheets already at the Unit. The decision for this meeting was in line with a request made at the previous meeting for more practical examples of what could be done (section 4.8).

Twelve teachers subsequently attended this meeting that was held

on 8 March 1996[18]. This was the highest number of teachers attending a meeting since the initial workshops of this study. For this meeting teachers wanted me to address the total syllabus, to point out to them how the Unit could assist them in every standard of school. This was subsequently done, but with some caution, trying to impress on teachers that the syllabus was not to be seen in a compartmentalised fashion.

The visit to the reserve was characterised by participants discussing various ways in which a natural area could be used in their teaching. The group also decided that they should meet at least once a month to exchange ideas. This never materialised, due to my own and the participating teachers' time constraints.

4.10 Presentation of this research project at the 1996 EEASA conference in Stellenbosch

During 1995 the participants had already proposed that this project be presented at the following EEASA conference, which was to take place in 1996. The conference, however, was scheduled to take place during the school holidays, 9 - 12 July 1996 (see appendix 12), and many of the participants whom I contacted informed me that they had other activities planned for the holidays. Of the five teachers who indicated that they were going to the conference, only three eventually attended. In my opinion, these three teachers' continuous commitment to the project was displayed by their attendance. The three staff members who were part of the project also attended the presentation.

In contrast to what I had expected, there was great interest in this presentation at the conference, and it was attended by approximately 100 people. The teachers preferred that I did the presentation, although they acknowledged that they were part of

[18] For a programme outline of this resource day see appendix 11.

it. They decided to deal with the questions pertaining to them, and I was interested to observe the confidence they displayed in speaking about their experiences.

Some of the conference delegates tended to generalise from this action research process, while others were very interested in the methods of involving teachers and principals in the study. Yet others made me aware that the research, as I described it, was similar to what they had experienced in their work, except that their work had "not yet been described formally".

4.11 Additional outcomes of the research

Reflecting on the research made me realise that there were more outcomes than I had anticipated. Although these were unplanned events, I only realised later that they formed part of the study. These unexpected outcomes revealed that teachers had started to make more use of the Unit. Some of the outcomes were the following:

- On discovering that the Unit has more to offer (such as assistance in greening projects), one teacher (CC) started to involve more people at his school. Eighteen plots were developed at his school for indigenous planting, with individual classes taking responsibility for each plot. The Unit's horticulturist assisted him with this. This teacher also invited Unit staff members to accompany him on activities with other teachers or students, thereby improving the link between the Unit and this particular school.

- Teachers started to visit the Unit on their own, used the resources and generally tried to find out what was available in environmental education (teachers HM, ML, BF and MK).

- One teacher (SN) brought his school group to the Unit and

did an environmental education project with them.

- Teachers in the forum started to interact with each other for assistance and ideas (eg. DF and HM; BF and HM.)

- The Unit staff were invited to send information on environmental education to schools, or to address the principal about the importance of environmental education.

- One teacher (ML) brought her students to attend one the Unit's life-skills workshops, which included learning about techniques on how to grow one's own plants. This led to students making cuttings and growing their own plants.

- Three of my colleagues were motivated to host a workshop for teachers on Arbor Day activities. More than twenty teachers (including six of the participating teachers from this study) attended. Their workshop was based on similar principles as in this study, i.e. identifying a problem, taking action, etc. The workshop was aimed at helping teachers to do their own Arbor Day activities, instead of relying on Unit staff to do it for them.

- One of the participants requested me to allow her to do a shadow study of myself at the Unit in the following year. She stated that she wanted to get more involved in the Unit's programmes.

4.12 Vignettes of four participating teachers

To illustrate how the participants experienced the project differently, the character sketches of four teachers were recorded (see appendices 13.1 - 13.4 for details on the vignettes). All these teachers attended the first workshop and the EEASA conference, but not all of them could be present at the Open Day workshop.

4.12.1 Comments on the vignettes

These four examples describe how teachers responded differently in the project, and how their understanding differed in terms of describing environmental education, taking action in environmental education and the level of confidence they displayed.

Teachers ML and CC, for example, stood out as two exceptional leaders in their commitment to environmental education. They took initiative to start projects even before this research project, for example, running environmental clubs and recycling projects, and taking groups out. It appeared as if they gained immensely from the research process (as indicated by them) in terms of encouragement and, in Teacher CC's case, in particular, there was a better understanding of environmental education. Teacher ML was unique in the study in that she had started out with an understanding of how socio-economic factors played a role in environmental issues and education. This understanding may be related to the prevalence of socio-economic problems at the school where she works. Both teachers are quite individualistic, in that they do not wait on others to take the initiative, and Teacher ML was even involved in changing the syllabus to do environmental education. Despite Teacher CC's experiences, he sometimes displayed a limited understanding of environmental education by focusing too much on the natural environment.

Teachers HM and DR were also interested in environmental education, with Teacher HM joining, for example, the research programme out of her own and remaining committed to attending it. It is, however, not clear that their participation benefitted them much initially. Both teachers' presentations showed that they interpreted environmental education in a quite superficial way. For example, Teacher HM wanted to use environmental education to keep pupils busy, rather than to engage them in a process of socially critical change. Furthermore, initially, she used the Unit in a very limited way, i.e. copying the available

materials. Generally, while Teacher DR thought he was benefitting from participating in the research process, he was not really developing a sense of initiative and meaningful action for environmental education. He seemed content to simply follow simplified instructions for implementing environmental education in the existing syllabus.

Teacher HM, on the other hand, decided to further her knowledge of environmental education by choosing environmental education as a module in her post-graduate degree course work. Her interest in environmental education was based on the experiences she had had in this study. She became very critical of her environmental education course presenters. In addition, she also made, out of her own, recommendations as to how the Unit could improve its programmes. Teacher HM asked to work more closely with the Unit and asked me whether she could do a "shadow" study of me in the Unit the following year.

CHAPTER 5

DISCUSSION OF RESULTS AND REFLECTION ON THE PROCESS

5.1. Introduction

In this chapter I discuss the results of this action research project, as they informed the development of an environmental education programme at the Unit, and as they clarified what a socially critical approach to environmental education means within the context of the Unit. I also reflect on the role the action research methodology played in this process.

The rich diversity of research outcomes described in the previous chapter means that a wide range of issues could be addressed in this chapter. I have however limited the discussion to the following topics:

- the education system and the ways in which teachers tend to function within it, where they either reproduce the hegemony or try and contest it;

- difficulties teachers experienced in trying to do environmental education in schools;

- clarifying the concept of socially critical environmental education in the context of the Unit;

- understanding environmental education more broadly and more deeply;

- theory, practice and action; the dichotomy experienced by all the participants, both researcher and teachers;

- action research as an opportunity for professional development;

- action research as a methodology for research.

These topics appeared to me and the teachers to run as central themes throughout the study. They are also the main areas to discuss in order to respond to the research question (see section 1.3).

In reflecting on the study, I realised that as a researcher who had previously only worked in a positivistic paradigm, my 'too fixed' an idea of what the outcome of the study should be, distracted me at times from the richness of the data. In many instances, I did not regard the 'unintended and unanticipated' outcomes as part of the data in the study. Kemmis and McTaggart (1988), in fact, warn against this tendency in action research. It was only when I revisited the data in more depth, towards the end of the first action research cycle - and more so when I was writing up the research report and revisiting the literature - that I became aware of the many meaningful outcomes. This is in line with the contention of Gerber *et al.* (1995:291), who list "rich, complex data" as one of the aspects of the essence of qualitative research. They state:

> the data that are used in the qualitative research process are experienced quite differently from those in other types of research...qualitative data are complex and rich in detail about the relationships that exist between the subject, object and context of the study.

In my case, my previous educational experience had not prepared me for the richness of educational research, which requires critical reflection and which is based on the principles of critical pedagogy.

5.2 The education system and how it shapes our lives

In this section I describe all the issues related to the

education system which emerged for the participants.

5.2.1 Introduction

Right from the start of the project I became aware of the tensions between what teachers would like to do (eg. environmental education, to initiate projects etc.) and the constraints they experienced associated with schooling and the education system. The interview data highlighted these tensions and the problems teachers experience in education (sections 4.1.2 and 4.2.2).

In fact, at the time of this study (Jan 1995 to October 1996), many specific problems in the education system participating teachers worked in (the former House of Representatives), were driving these schools to the brink of a crisis, and participants often reported feelings of demotivation, despondency and uncertainty. For example, teachers explained:

> I feel frustrated with teaching and its associated problems...because of that other teachers also lack enthusiasm...Our education system never provided me with the opportunity to pursue the field I am really interested in (teacher LP);
>
> I generally feel frustrated because of the problems at our own school. Our school is plagued by vandalism, children are hungry, there is a shortage of books...there is competition between teachers because of the politics... (teacher FT);
>
> The school climate, at the moment, is very negative...there are also problems with the coming retrenchments...teachers do not feel like starting new projects (teacher KH).

Such statements led me to want to develop a better understanding of the functioning of the education system and schooling, and how it influenced us to behave in particular ways. Meerkotter and van den Berg *et al.* (1994) reflections in this regard were useful. They contend that schools:

- tend to promote the views that the dominant order within society seeks to establish and promote, and

- tend to function to reproduce the social, economic and political order supported by those who rule.

Stevenson (1987) also refers to the traditional purpose and structure of schooling and how it contributes to maintaining the existing social order. Schools can thus reproduce authoritarianism, oppression and inequality in society (Freire and Shor 1987, Fien 1993). This could be one of the reasons why the dominant practices in most schools emphasise the passive assimilation and reproduction of simplistic factual knowledge and an unproblematic 'truth'. I agree strongly with Stevenson (1987) when he further states that current schooling is not designed to develop critical thinkers, and problem-solvers, or active participants in environmental and political decision-making.

South Africa (of the past) can be regarded as a society in which, according to Meerkotter and Van den Berg (1994:3),

> human rights and freedoms have been whittled away to an alarming extent, it is also a country in which schooling has played a well-nigh demonic role in the perpetuation and consolidation of the political exclusion and economic exploitation of the great mass of the people.

Furthermore, the influence of Christian National Education (CNE) and Fundamental Pedagogics (FP) (Ashley 1989, Meerkotter and Van den Berg 1994) forced education into being regarded as a value free, 'neutral' activity which perpetuated positivistic modes of thought, thus reducing the possibilities of engaging in critical and reflective thinking (see section 2.6.2). The term a 'banking model' of education is used by Freire (1973) to describe this type of education, namely a system where the teacher narrates the subject to the students (transmission of information).

Although South Africa has, since the first democratic elections in 1994, been going through processes of transformation, we still experience the legacy of the past, especially at a psychological and a structural level. This has narrowed South African education down to little more than a socialization process, which perpetuates the *status quo* in treating knowledge as truths which are to be discovered, rather than as something which is humanly constructed. In fact, in our South African context, schools have been designed to sell knowledge, a practice which corresponds to the dominant capitalist ideology.

Thus, the inherited education system in general, the brainchild of the previous, oppressive 'apartheid' regime, has exacerbated, through its insidious conditioning, the inability of students and teachers to think critically or to have the fortitude to voice their opinions when they disagreed with something (Adams 1992:25). This effect of schooling in South Africa has been highlighted by Brown (1992:77) who quotes Molnar (n.d.) as follows:

> The worst influence school has is not on the excluded or the truants, but on those who stay on...The bulk of dispirited, grossly lacking in intellectual self-confidence, diminished in articulateness, stultified in imagination, always undervaluing their own capabilities, and robbed of any ability to see themselves as a source of intellectual creativeness.

We, as teachers and environmental educators are long-habituated to passive schooling, and the actions of participants in this study can thus be explained against this background.

There are several problems in the Education System which have an impact on practitioners. In the words of teacher DF :

> the whole education system is a problem and it is difficult to get out of it [referring to old ways], to now want to change the total teaching method is difficult, teachers are comfortable with the syllabus,

and do not see themselves changing it now.

Aspects of the South African education system, and the ways in which they seem to influence the lives of the teachers participating in this study, are discussed below.

5.2.2 Socio-economic factors affecting participating teachers

In this section I highlight the socio-economic factors which had an impact on the participants and how they viewed such factors.

5.2.2.1 Lack of physical resources and overcrowded classes

Participating teachers were confronted by overcrowded classes, poor facilities and few resources. In the South African context, it is well-documented that teachers have been working under severe difficulties because of the wretched physical conditions where schools are overcrowded and poorly-equipped with poorly trained teachers (NEPI report 1992, SAIRR report 1995). These led to demotivation, reflected in the fact that some teachers considered the lack of resources to be an important constraint in doing environmental education in schools (see section 4.1.2, and table 4.3 in appendix 2.3).

This latter result reflects an important finding - the prevalence of a belief that in order to practice environmental education, one needs expensive resources. This corresponds with the view (sections 4.2.1, 4.2.2, and table 4.3 in appendix 2.3) that environmental education only involved studies in nature, and that costly excursions were therefore a prerequisite.

5.2.2.2 The presence of poverty

Some teachers felt that the presence of hunger due to poverty amongst their students should be addressed first, before children

could learn about environmental education or go on excursions. Teacher FT stated that the reason why she thought it was difficult to do environmental education is that the "pupils coming to school are hungry." These results also seem to reflect a narrow view of environmental education, for most participating teachers failed to make the link between the poor socio-economic backgrounds of their students, and the heightened relevance of education for sustainable living to those students' lives.

5.2.2.3 Gangsterism

Gangsterism in and around the schools in which participating teachers worked (see section 4.1.2, Earthyear 1995) seemed to contribute further to their reported feelings of despondency. Disruptions at schools, caused by gang related activities, interrupted teachers' daily programmes and created an atmosphere of tension and unease. Teachers thus felt that not only environmental education, but also gangsterism had to be addressed. I could not ascertain whether teachers made a connection between gangsterism and environmental education or whether this was only mentioned as a concern as to how the possibility of doing environmental education is affected by the presence of gangsterism. One teacher mentioned that her pupils were more interested in gangster activities than in environmental matters.

5.2.2.4 Teachers' perceptions of socio-economic conditions and environmental education

At the initial interview stage, the socio-economic conditions under which teachers worked seemed insurmountable to them. Teachers separated socio-economic problems from the environment, as if the latter was 'out there'. This perception is reflected in their view that socio-economic problems first had to be addressed before they could do environmental education. As the project progressed, there appeared to be a change in the mind-set

of the core group of participating teachers with regard to socio-economic problems. Some of that same group of teachers were, for example, encouraged after attending the 1995 EEASA conference. This happened after learning that others working under worse conditions still continue with environmental education projects (see section 4.4.2.3).

It appeared to me as if aspects in the socio-economic situation affected the teachers' approach to teaching. Some teachers felt apathetic towards their situation, whilst others had a deep concern about their pupils and, despite negativity, still attempted new projects. Teacher ML, whose school, at the time of this study was the worst affected by gangsterism, reported that although her recycling materials were often stolen, she continued motivating her pupils with their recycling project.

5.2.3. Political-economic influences on practice

At the time of this study it was announced that, due to education budget cuts, the Western Cape Education Department had to retrench or redeploy 5 935 teachers (SAIRR 1995, Cape Times 20 March 1996, Sunday Times 22 September 1996) as part of a policy of rationalization. This move was also intended to achieve the nationally set pupil-teacher ratio of 40:1 in primary schools and 35:1 in high schools, before the end of 1998. The situation was characterised by great uncertainty amongst many teachers, which also impacted on the teachers in this project. Teachers, for example, had to decide which of their colleagues had to go (Chalkline 28 August - 10 September 1996). Several participating teachers felt very uncomfortable with the idea of deciding which of their colleagues should lose their jobs. During this period in 1996 many important teacher meetings were held and participants (teachers KH, BF, NG) in the study often reported in interviews that they felt stressed about the unpleasant working environments and feelings of insecurity. Teachers said this factor contributed to them feeling discouraged to start new

projects or to get involved in projects, or to practise environmental education.

Towards the end of the second cycle (October 1996) of the research, the effect of the above was so severe on individual participants that they completely forgot about meetings. Clearly, the threat of retrenchment caused some participating teachers to be very uncertain and dampened their enthusiasm for the teaching profession.

5.2.4 Lack of support from colleagues

Another factor contributing to the problems that the participants faced at their schools was articulated by them as their lack of motivation caused by isolation. I would argue that this was related to the isolation most of the participants experienced in their schools, with no sharing of ideas, or collaboration with their colleagues, to do environmental education. Participants complained that their colleagues did not realise the importance of environmental education and there was a lack of support from the principal in what they were doing. These feelings of isolation, were reflected in the teachers' wish to involve their colleagues through an Open Day presentation.

One teacher, KH, had the following explanation for his colleagues' lack of interest in developing enthusiasm for environmental education:

> Teachers who are now entering the teaching profession are typically from the 1985 boycott era; they are lax, do not have drive, cause a breakdown in discipline and do the absolute minimum.

However, it is not within the scope of this study to determine whether laziness is really such a contributory factor to some teachers not wanting to get involved in environmental education initiatives. A more pertinent reason may be related to a

perception that environmental education is for Science teachers only (as was noticed with the Open Day).

Another aspect that the participants mentioned relating to a non-supportive attitude of colleagues was the role of the principal. The authority of the principal was identified by some participants as a problem for teachers wishing to do environmental education. One teacher reported on her principal's non-supportive behaviour (see section 4.5.2). He seemed to be contributing towards creating a working environment, in which teachers who felt enthusiastic and motivated about environmental education found it difficult to fully express themselves in their professional interests.

Although schools do differ in terms of the kind of culture that prevails among staff, the principal does appear to be a major influence through his/her role as leader of the school. In a study by Davidoff (1993b) she argues that the principal's leadership was a vital aspect of any change initiative.

Teacher ML however, asserted quite confidently that their staff were "far too liberated to allow our principal to get away with that" (referring to authoritarian behaviour). Thus, while a mind-set of passive acceptance of authority contributes to, and perpetuates constraints of the system, in some schools there is positive resistance against authoritarian principals. If the staff decide otherwise, principals in reality might not have all the power we assume they have. The acceptance of the authority of individuals displayed by some teachers could be attributed to a past in which they as pupils and student teachers were taught to follow the instructor without questioning.

The study indicates that there is a great need for principals of schools to become involved in environmental education initiatives, or at least to be better informed of the importance of environmental education. In this way, through purposeful

leadership, the principals could actively become involved in the curriculum initiatives in their schools, without exerting stifling control.

5.2.5 The role of the curriculum

Another serious constraint to the practice of environmental education identified by teachers was the nature of the curriculum. Some participants in this study complained that the curriculum was "too full, sometimes with unnecessary facts" (teacher DF) that they have to teach to their pupils (see also section 4.2.2). It was difficult to ascertain to what extent this aspect was a real or merely a perceived constraint, especially in terms of time, on environmental education practices. One participant (teacher CC), for example, despite his many extra-curricular activities, managed to participate throughout this study and he attended all the meetings.

A second view related to the curriculum was that "education is too compartmentalized" (teacher GA), with the result that there is hardly any interaction between different subject teachers. The many views on this topic which reflect a compartmentalised view on 'curriculum' is reported in chapter 4 (see section 4.3.2). There was also a concern from teachers that environmental education which could support the syllabus should be designed, thus indicating their concern to be syllabus orientated.

The view that environmental education programmes should support the syllabus (and not be a part of it) suggests that these teachers see environmental education as something to be done separately from the subjects they teach, and not related to all subjects. Once again, this view displays a need for environmental education which is multi-disciplinary, compared to a compartmentalised view of knowledge as presented currently to students (Fien 1993).

An additional concern relating to the curriculum was the changes it underwent during the time of the study, for example, towards continuous assessment, which caused uncertainty amongst participants and made them look towards environmental education staff for assistance (see section 4.8). Environmental education was seen as a tool to help teachers with continuous assessment. The fact that these teachers requested specific guidelines on how to implement continuous assessment perhaps indicated a wish for authoritative guidance, in accordance with what they were used to.

There were those participants who felt it was difficult to do environmental education because the curriculum did not prescribe it. Those who generally mentioned this point had their own interpretation of the curriculum, namely, that it is something that needs to be strictly followed. On the other hand, there were also those who argued that the syllabus was only there for guidance (see sections 4.5.2 and 4.12.1). Here was a sign that some teachers had undergone a change in their thinking.

Changes such as these started to occur as the study progressed. The core group of participants started to realise that they too could participate in change. Towards the end of the first cycle they requested, through the unit, to be part of changing the syllabus. Earlier, most participants had seemed to unquestioningly accept the prescribed syllabus. The experiences of the participants in this study made me believe that there were signs of a more empowered mind-set. I felt that the experiences in this action research project, where teachers could openly discuss issues, think about issues and participate in decision-making, led them to behave differently. Freire and Shor (1987) feel that through participation in discussion and decision-making, and through analysis and illumination of issues, teachers and students develop themselves in the skills needed to speak up and to act on matters which affect them.

5.2.6 Educators' mind-set as shaped by the education system and environmental education

In the introduction to this chapter (see sections 5.1 and 5.2), I argued that the authoritarian forms of education, influenced by CNE and FP, have had certain effects on educators and on the research participants' lives. Teachers in this system tend towards transmissive styles of teaching to passive learners. This is, after all, to be expected, since these teachers, themselves, were taught and completed their professional development in this system. In this study most teachers appeared to accept the educational situation as one in which they simply have to do the best under the circumstances, and saw themselves as powerless to control that situation. One teacher (DF) referred to school and teaching as a matter of "survival".

An uncritical practice of education is perpetuated by uncritical teachers, and thus an unquestioning nature in both pupils and teachers is the result. This nature in teachers was apparent in the way most participants reported to be following the syllabus without realizing that they could change or adapt it, thereby behaving as 'victims' of the system. Teachers did not appear to realize that it was they themselves who chose not to do more than what is prescribed. One teacher (ML) mentioned that whereas other teachers cannot change the syllabus, she can and has done so (see section 4.12.1).

I started to become aware of the effect of schooling on our lives. It has been so insidious that we are seldom aware of it. We are socialized to accept authoritarian classroom practices to such a degree that we do not realize to what extent they have shaped our lives, our minds and the kind of people we have become. This insight, developing from the research, made me look critically at the influence of the education system, not only on the teachers, but also on myself.

Some critical theorists (Fien 1993, Trainer 1990, Huckle 1988, Carr and Kemmis 1986) report on how the education system promotes the dominant views of society (see section 2.6.1). Curriculum researchers state that one of the ways in which this occurs is through hegemonic ideologies which act through overt and hidden curricula to mould the values of the students and teachers in line with those of dominant social groups. In this way, educational institutions are predominantly geared towards the socially and ecologically unsustainable values of industrial, affluent, consumer society. Teachers participate - through their action - in unquestioningly supporting these views. The term "false consciousness" is used to describe the status of such distorted and uncritically accepted beliefs (Carr and Kemmis 1986), the impact of which undoubtedly has negative implications for the well-being of the environment.

Furthermore, our education system, being practised in a capitalist state, also functions in perpetuating unsustainable environmental practices. Environmental education, especially a socially critical approach, can thus be regarded to function as a counter-hegemonic activity in its challenge to the role of schools as agencies perpetuating economic and cultural reproduction, and unsustainable development.

Stevenson (1987:75,76) also referred to environmental education as being in conflict with how schools function. He noted that while environmental education advocates "learning that is holistic and co-operative, school learning tends to be atomistic and individual". Environmental education aims to encourage students to be active thinkers and generators of knowledge, whereas in schools, students are usually the passive receivers of other people's knowledge and thinking. He (ibid:79) refers to Esland (1971) who stated:

> Introducing environmental education into a school challenges the dominant conception, organisation and

transmission of knowledge, creating for most teachers conflict with their approach to teaching and learning.

Environmental education would thus demand a change in the way in which the teachers generally teach and the way in which schools are organised.

Education *for* the environment (socially critical environmental education) challenges the dominant worldviews (see sections 2.3.3 and 2.3.3.1). Through this study I started to realize just how entrenched the dominant worldview is in our ways of thinking and living. It is even more difficult to change a system of which we are implicitly a part and the way life is designed in it. Although education for the environment requires action, the focus should perhaps not necessarily be on action, but in coming to a better understanding of how systems, for example, schools function and how they have contributed to our 'false consciousness'. To expect changes in the form of action might be to adopt a technicist approach. In the project it seemed that the teachers started changing their views and actions unconsciously and I started to reflect on those observed changes.

5.2.7 A language of possibility for teachers

In attempting to do environmental education, teachers face a combination of real and practical constraints in the system, and those that they themselves have created. These latter, self-created constraints, which formed insurmountable problems in the minds of the teachers, I regarded as being created by the 'mind-set'. This perception is in keeping with Carr & Kemmis (1986), who refer to a difference between 'objective' and 'subjective' constraints. The former, within the educational system, refer to those aspects which are beyond the power of a particular individual's influence at a particular time; the latter are rooted in individual comprehension of a given context and are thus subject to change.

The results of this study show that objective constraints (eg. the curriculum, the principal's attitude) for one person, may be the subjective constraints for another person or teacher (who, for example, never thought of taking action against the situation). In this connection, Carr and Kemmis (1986:184) state:

> ...there are 'objective' constraints on social thought and action which are beyond the control of particular individuals or groups. Equally there are 'subjective' constraints which people could change if they knew more or understood the world differently, but which do limit their potential for thought and action.

Within the context sketched above, most the participants in this study seemed to be functioning on the level of victims in the education system. However, this study has shown that action research can play a meaningful role when it sets out to locate the actions of teachers (actors) in a broader social and historical framework. Carr and Kemmis (1986) say, in this regard, that :

> It (action research) treats the actor as the bearer of ideology as well as its 'victim'. By changing his or her own practices, understandings or situations, action research reminds the practitioner that he or she is, in some small way, changing the world.

5.2.7.1 Agents for change

Against and within the context discussed above, there are teachers who attempt to do environmental education, demonstrating the potential for 'taking action', and for being agents for change (see sections 4.2.1, 4.5.2 and 5.2.4). Fien (1993) refers to a "language of possibility" in environmental education, which can replace the pessimistic language of critique and determinism, thereby empowering teachers to understand both the limits and enabling possibilities that characterise schools. According to Fien, the values and social participation objectives of education

for the environment are based upon such a language of possibility.

Giddens's structuration theory of 1970 addressed the dualistic nature between the potential of individuals (individualism) to act in ways they choose and the view of structure (structuralism) as an overwhelming constraint to human action. Giddens (1981, in Fien, 1993), taking his structuration theory further, argued that all human action is carried out by knowledgeable agents who construct their social world through their action but, at the same time, their action is restricted by the very world of their creation. In other words, we create society at the same time as we are created by it. However, according to Giddens (ibid), social practices are performed by agents who have the ability to act differently, since they have the capacity for self-reflection, which provides consciousness to what they are doing. This, in turn, makes them capable of some degree of penetration of the social forms that oppress them. They thus become able to influence and change these structure.

The implications of this view for teachers are that teachers are able to 'make' their roles in schools and classrooms, either by participating in, acquiescing to, or resisting the power relations and ideologies active in a teaching context. This is borne out by the current study, which has shown that teachers' work is characterised by a degree of relative autonomy, and that different teachers interpret that level of autonomy differently within hegemonic limits. Teachers who are doing environmental education, despite the nature of the syllabus, can thus be described as 'resisting or transformative intellectuals' (Giroux 1985).

5.3 Difficulties experienced in trying to do environmental education

The fact that environmental education is not part of the formal

curriculum can probably be regarded as the biggest difficulty faced by teachers who wish to teach it. Furthermore, its informal status means that environmental education is further relegated to an extra-curricular concern by most teachers. The impact of these two factors combined means that environmental education is always the first to go whenever teachers experience a difficult period in the education system (eg. curriculum changes or possible teacher retrenchments).

Initiatives were, however, on the way to make environmental education a focus in curriculum development (EECI newsletter 1996, EECI, EEASA and DE&T September 1996). The first democratic elections in the country brought expectations of transformation, including a new education system and a reconstructed curriculum. The implementation of new initiatives generally cause feelings of uncertainties for teachers as I have found in this study.

The absence of environmental education in the school curriculum also implies its absence in curricula for teacher education. This help to explain the participants' feelings of not being confident to do environmental education (see sections 4.2.4, 4.7.2 and table 4.10). In the first workshops, participants identified a need for teacher development programmes. Non-governmental organisations have played a major role in in- and pre-service environmental education programmes for teachers (see sections 2.5 and 2.5.1).

I had assumed that teachers could, with basic background to environmental education, "do" it for themselves. However, I realised there should perhaps, in environmental education initiatives, be a greater interaction between teachers and environmental educators to jointly develop a better understanding of environmental education practices. Environmental education should not be viewed as a set course but rather as an ongoing process.

The language the participating teachers used further reflected their mind-set of dependence on guidance through authority. To them, environmental educators are the 'experts' to do and show them how to do environmental education. The complexity of environmental issues, and the limitations of existing knowledge, both require environmental education to be a process through which teachers, environmental educators and others get together to jointly develop new solutions. In this way, environmental education will be viewed differently, namely, as a process of developing, rather than a tool used to show people how to become environmental educators (Janse van Rensburg 1995).

As for myself, I started to realize that attempting to explore and understand the full extent of socially critical environmental education could become such an overwhelming 'goal' that I felt, at times, disempowered and despondent, wanting to achieve 'it', for both the participants and myself. This made me realise how teachers, who are facing practical constraints, and who have not had the experiences of environmental educators, could easily also become overwhelmed and despondent. Despite the need for socially critical environmental education, especially for teachers and other educators, I realised how difficult it must be for teachers facing all the (objective) practical constraints in the education system. Therefore, I concluded, environmental education should be viewed as an ongoing process with many facets, the ultimate goal of which should be an engagement in the processes of socially critical environmental education.

5.4 Clarifying the concept of socially critical environmental education in the context of the Unit

As one of the objectives of the study was to clarify a socially critical approach to environmental education within the context of the work of the Unit, I will briefly explain (further to sections 2.3.3 and 2.3.3.1) how a socially critical approach to environmental education is described in the literature, and then

discuss it in the context of the Unit. I will then look at a socially critical approach to environmental education in terms of its implications for the study.

The classifications of environmental education described earlier (education *in*, *about* and *for* the environment, in section 2.3) are usually based on Habermas's (1972) theory of knowledge constitutive interests. These different frameworks of knowledge, namely technical, practical and emancipatory interests embody different ways of seeing the world and of organising knowledge about the world. Socially critical environmental education can be located in the emancipatory interest, described by Grundy (1987:19) as:

> a fundamental interest in emancipation and empowerment to engage in autonomous action arising out of authentic, critical insights into the social construction of human society.

This quotation embodies the idea that emancipation occurs through a process of reflection, and that this process itself constitutes the possibility of empowerment. Empowerment is seen as the ability and willingness of individuals to take action to develop control of their lives.

It is therefore the 'false consciousness' described in section 5.2.6 that has to be identified and cast aside in the process of emancipation. And, education *for* the environment is seen as a central means to achieve this end since, it has a socially critical focus, which challenges the 'business as usual' approach to social institutions such as economic development and education (Fien 1993, Stevenson 1987, Huckle 1993, Greenall-Gough and Robottom 1993). Such an orientation concerns itself with a critical understanding of society and seeks to empower students to participate in a democratic transformation of society (Greenall-Gough and Robottom 1993).

Other features of socially critical environmental education which I regard as important are: understanding social systems and structures, acquiring experiences in critical reflection, and taking action through participation, to change aspects of social life when it seems necessary.

Socially critical environmental education should therefore include developing a critical consciousness based upon an understanding of how environmental problems are social problems, with their root causes in the nature of the social systems in which they are found (Fien 1993).

In the light of the preceding description on the education system and how teachers have been 'deskilled' (Aronowitz and Giroux 1987, Freire and Shor 1987) to become 'instructional technicians' (Carr and Kemmis 1986), the question to be asked firstly is what a socially critical approach to environmental education means under those circumstances. Secondly, we need to ask what the implications for socially critical environmental education are in the context of the Unit.

The process of socially critical environmental education, when involving teachers, should concentrate on overcoming a mind-set of powerlessness. Powerlessness can be regarded as a key constraint to doing environmental education in schools (i.e. the mind-set of teachers, which causes no action to take place). This victim-of-the-system mind-set may, to a large extent, explain why several participants reported the time factor, curriculum and socio-economic conditions as problems in doing environmental education (see sections 4.2.2, 4.5.2, 4.7.1, 4.7.2 and 5.2.2).

By the above I do not imply that there are no real practical constraints on teachers' efforts to do environmental education. Even those who are trying to do environmental education come up against constraints. Furthermore, the constraints which the

teachers in this study mentioned are common and fairly universal, as evidenced in studies carried out by Ham and Sewing (1987/1988) and Spork (1990) (see section 5.2.2.1). Teachers have a real need for support, a need for more information, assistance and resources. These constraints have implications for the recommendations on the teacher support programme(s) at the Unit (see sections 6.2 and 6.3).

Throughout the study I assumed, mostly subconsciously, that environmental education can only be achieved if all the participants became socially critical practitioners. Many times I felt that the goals of the study were not being achieved, and I kept seeking ways to address this aspect. My idea that being socially critical was a goal to be achieved and not an ongoing process is similar to that of Hungerford (1983, in Robottom 1987). My other thought was that in order to become socially critical environmental educators, teachers would have to be 'empowered', especially in critical thinking skills. To empower would mean that power is given to the teacher or student by the researcher or 'change agent'. Firth (1996) explains that power is not something one can give from one party to another. He quotes Foucault (1980) who stated that power is something which circulates; it only exists in action (relational) and that individuals are the vehicles of power, not its points of application. To empower someone else would then mean that there is a distinction between those who give power (the researcher or teacher) and those who need to be empowered (teachers or students), setting up a divisive relationship of 'us' and 'them' (Firth 1996).

Regarding myself as researcher however, I was in a favourable position to achieve a good understanding of a socially critical approach to environmental education, due to my engagement with the literature and my interaction and discussions with my tutor. Despite this privileged position, I realized from the outset of the study that I was not in a position to assist the participants

as much as I wanted to because of my incomplete understanding of socially critical environmental education. It was only in the second cycle that I came to realize the deeper nature of this approach. At the same time I realized that I was also developing a better understanding of my own 'false consciousness'.

Coming to a better understanding of socially critical environmental education made me realise that all of us (teachers and environmental educators), in the light of socially critical environmental education, need the following:

- more information on environmental education for teachers (sections 4.2.3, 4.4.1, 4.5.1.2 and 4.7.2), especially information on environmental education in order to make informed decisions;

- to understand how the education system functions, with the influences of CNE and FP, and their effects on us (enlightenment);

- to reflect on the way in which our perceptions about authority, expertise, power or lack of power constrain action;

- skills in decision-making and leadership; and most of all confidence in forming conclusions and opinions; this would allow us to encounter ideas and arguments as enquirers rather than as victims;

- to critically reflect on issues, the situation we find ourselves in, their history and how things came to be the way they are; meaning that nothing is cast in concrete - knowledge and systems are socially constructed;

- opportunities to experience our own ability to take action to change our situations and do what we find meaningful -

in this case environmental education;

- to realise that teachers have theories of their own, and that theory and practice cannot be separated - see section 5.6.

This list, derived as points from my experience in the study, constitutes what socially critical environmental education would mean in the context of the Unit. These are the areas in which the Unit needs to help teachers, in order to put into action the processes which comprise socially critical environmental education. The actual implications and recommendations for the teacher support programmes to be run at the Unit will be addressed in the last chapter.

5.5 Developing a broader and deeper understanding of environmental education

The results reported in the previous chapter, reflect the broader understanding of environmental education that the core group of participants (including some of those who had not even attended the first EEASA conference in 1995, but had stayed part of the process) and I all came to through the research process.

At the start of this study most of the participants had had a limited understanding of environmental education as having to do only with ecology and interactions in ecosystems (sections 4.2.1, tables 4.1 and 4.2). This view of environmental education, as being only concerned with the natural (biophysical) environment, is narrow compared to the broader view of the environment, environmental issues and environmental education as advocated by Greenall (1987), Di Chiro (1987), Robottom (1987) and O'Donoghue 1993a). However, this narrow view is not unique to these participants; in fact, it is quite widely held (Fien 1993; O'Donoghue 1993b).

A broader view to environmental education means coming to a realisation that social aspects are part of socially critical environmental education. However, this does not give the full story. An understanding of how social aspects are related to environmental education has to be viewed as part of that story in order for people to become socially critical environmental educators.

As a means to achieving such a 'big picture' there was, from the outset of the study, a commitment from the participating teachers, especially the core group of participants, to develop a broader and better understanding of environmental education. This is illustrated in them attending meetings and conferences, and in their ongoing interacting engagement with each other and with me. The gradual dawning of the broader understanding required was noticeable in their reports after attending the 1995 EEASA conference, and the manner in which they subsequently spoke about environmental education (sections 4.4.1 and 4.4.2.1).

It was difficult for these participants, however, to put their broader theoretical understanding 'into practice' (see section 4.6.3). This is similar to Van Rensburg's findings (1995), who argues that people (like environmental educators), with a growing awareness of what comprises socially critical environmental education, begin taking on the newer 'discourse' - since it makes sense to them ('resonates' with them) - but without necessarily knowing what it would mean in practice for them. Likewise with the participants in my study: I realised that despite their broadening understanding of environmental education, as reflected in their frequent use of the newer discourse, their fundamental grasp of the concept of environmental education was still too tenuous to give them the confidence to articulate this broadening understanding in practical terms.

This process of a broadening understanding turning slowly into practical articulation, finds an echo in O'Donoghue's (1993a)

proposed model, in which learning is conceptualised as consisting of interacting processes of dialogue (talking), encounters (touching or becoming part of real issues) and critical reflection within a context of action (doing something). In the context of this study, however, the 'action' of the Open Day, as an aspect of critical reflection within a context of action, was insufficient for adequately meaningful learning to have taken place. See section 6.3 for recommendations in this regard.

Although I was excited about the commitment teachers displayed by participating in this study, I was also full of doubt about the action research process itself. My main concern was how to facilitate the process, so that it could become emancipatory for the teachers. I wanted the teachers to reflect critically on their environmental education practice in relation to the broader political context in which they were working. However, even if this had not happened, I noticed tremendous growth in the teachers towards the end of the second year of the project. This growth was manifest in the fact that some of them started to make use of the Unit on their own, while others began expressing a broader understanding of environmental education (eg. its interconnectedness and its relations to structures).

My own understanding of environmental education has also undergone significant changes since the start of the study. This was due, in part, to my interactions with, and observation of, changes within the participants. Then, the ongoing discussions between the tutor (supervisor of the study) and myself also aided in the achievement of a deeper understanding of environmental education for me. However, it was my engagement with the literature, as well as the actual writing process itself, which had a much greater effect in me developing a deeper understanding of environmental education.

Nonetheless, despite the advantages I had over the teachers by doing course work for the M.Ed in my first year, this still did

not prepare me for the practice of environmental education: the real learning for me started when we started engaging with practical aspects.

5.6 Theory, practice and action: The dichotomy

This section introduces an issue which emerged for those participants who had attended the 1995 EEASA conference, and for myself. Most of those participants viewed the theoretical background on environmental education presented at the conference as "jargon" and referred to it as "too academic". On questioning the teachers further about this, my suspicions were confirmed that the participants were confusing theory with academic language. They also felt they had no theory of their own. From their point of view, theory is something they cannot apply or use in relation to their practice; it is remote from their practical experience of the way things are. From my own observation, the two major components of the 'theory' construct for teachers are firstly, that it, implies 'remoteness' from their professional knowledge/experience and secondly, that it implies a threat to their professional knowledge and status from the academic community.

Theory, however, should be understood to refer to the relationship of ideas to action: how reflection expresses itself in the life and work of the practitioner. On this basis, says Carr (1995:13), we might speak of every practitioner as being guided by theory, meaning no more by this than that the practitioner has ideas. Kemmis and Carr (1983) state that by being theorized, practices have meaning and, inversely, it is by being practised, that theories have historical, social and material significance. Theory and practice cannot be separated

but are mutually constitutive aspects of one another (Carr 1995)[19].

It could be said, for this study, that the teachers needed the 'theory' in environmental education to broaden their view of environmental education. However, they also found the same 'theory' disempowering because it (theory) did not provide them with a 'recipe' for how to do environmental education; neither did it seem to take into account the practical conditions under which they were working.

Initially, I had also thought that more information (or 'theory') on environmental education presented to the participants, would lead to better action/practice (eg. to make informed decisions on how to do environmental education) but I discovered that this is not necessarily the case. The main reason for this failure is that both the teachers and I tended to separate theory from practice. However, as this study (an exercise in praxis) has shown, this dichotomy, challenged by Carr's explanation of 'theory' above, can be overcome through the action research process (Robottom 1987, Elliott 1991, Carr and Kemmis 1983).

This dichotomy between theory and action in my understanding is exemplified in my action where I previously had a certain theoretical background about action research, by knowing about it only from the literature and having had a particular understanding of how it should work. Practice, however, made me change that understanding, which is now quite different. When

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[19] Carr (1995:32) explains that 'theory' can have at least two distinct meanings. On the one hand, it can refer to the actual products of theoretical inquirers and, when used in this way, it is usually presented in the form of general principles, laws, explanations and the like. On the other hand, 'theory' can refer to the framework of thought that structures and guides any distinctive theoretical activity. For a historical background on at least two quite different approaches to the meaning of 'theory' in the history of Western thought, see Carr (1995).

I now look at the literature with the benefit of my experience of doing action research, I understand the literature ('theory') in a very different way. The interactions between 'theory' and 'practice' are thus cyclical. I can therefore not argue for a greater interaction between 'theory' and 'practice' for that would mean viewing the two concepts as dualistic[20].

5.7 Action research for professional development

In this section of the discussion I reflect on the action research process as an opportunity for professional development, for both the participating teachers and for myself. Some points discussed here have been raised before.

This group-based action research project (Robottom 1987), where practitioners from different settings were drawn together because of similar curriculum interests, has shown that our present schooling system, with its concern for maintaining the status quo, makes teacher and student empowerment through participation in collective action and critical reflection, as in action research, both particularly difficult and urgent[21]. The difficulty is mainly due to constraints of two different kinds - practical or real constraints, which mainly involve the full programmes of many teachers as well as the influence of CNE and FP, and secondly mental constraints, or a certain mind-set, namely, the belief amongst some teachers that they really cannot get involved, that they do not have the time.

Despite the constraints, I believe action research provides a

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[20] I will not discuss this tendency of separating theories from practices in greater depth here, but will touch on it again in the recommendations for possible follow up actions to take in this study.

[21] Teacher and student empowerment through participation in collective action and critical reflection is urgent on two main fronts: to assist in the transformation of South Africa; and because our environment is in crisis.

feasible opportunity for teachers' professional development, as proposed in the literature. In fact, the literature advises that active participation in action research projects is a valuable opportunity for professional development (Robottom 1987). In this study there were signs of professional development in the way in which, for example, some teachers overcame their mind-set by starting to take action and initiative in the project (see results section 4.7.2, 4.10, 4.11 and appendix 13).

There were also many other signs of teachers changing in this process. Despite the initial view that socio-economic problems first had to be overcome, one participant still continued with environmental education activities. Another teacher enrolled for higher studies and chose environmental education as a module, and participants became more critical in their view of the Unit and started making recommendations on how programmes could be improved, asked for reports, attended the EEASA regional meetings with me and one teacher asked if she could do a 'shadow' study of me at the Unit the following year. This latter finding also reflected a shift in the power relations between me and the other participants.

I was heartened by the initiatives of the participants towards the end of the study, indicated by requesting meetings and enquiring about the development of the project. All of these, to me, illustrated that the process was contributing to the professional development of the participants. Instead of me trying to concentrate only on the "emancipatory" possibilities of action research, I realized that action research has perhaps a contribution to make towards any of the "technical, practical or emancipatory" modes (Grundy 1987:7), and there should not be such a big concern about placing it in a particular context. We should start 'where the teachers are'. Like Davidoff (1993) I experienced the tension between working 'where teachers are' and wanting to play a more critical role by asking the kinds of questions typical of more focused and critical self-reflection

(as in action research).

As the project continued, I noticed how different teachers responded differently in the study, and I started to wonder about the personal theories they hold and their personal transformations in this process. Although not an objective of this study (due to time constraints), I felt strongly that this aspect of the study should also have been an important one. My thoughts found resonance in the work of Davidoff (1993:59) who stated that "the personal dimension.....is an implicit, yet under theorised and minimally understood aspect of emancipatory action research". She argues for a more explicit understanding of the dynamic relationship between personal, professional, institutional and political transformation. One can argue that teachers as people, and the way they interact with their students, are not separate from how they are as people in the world beyond the classroom. Fullan and Hargreaves (1992:36) summarize this very clearly by saying that

> You cannot understand the teacher or teaching without understanding the person the teacher is too... Teachers become the teachers they are not just out of habit. Teaching is bound up with teachers' lives, their biographies, with the kind of people they have become.

Any attempt, therefore, to offer professional development for teachers, if it is to recognise teachers as people rather than merely technicians, must also take personal transformation into account. In most cases, in South Africa at least, professional development has been seen primarily in terms of the improvement in the subject-knowledge base of teachers, or their classroom methodologies (Davidoff 1993b). Their personal journeys, the events in their lives which have shaped who they are and how they relate to the world and to their students, have largely been omitted as a fundamental aspect of professional development. Understanding teachers' actions better, and keeping the

'personal' in mind, would also have implications in designing environmental education programmes with teachers.

Out of the above understanding, I came to realize that the literature proposed ideal characteristics for doing action research (Kemmis and Mc Taggart 1988). With that in mind, I kept on wanting to measure the 'performance' of the participants in the study against the principles as proposed for action research. I was however, failing to take the 'real life' situation of teachers into consideration. In this regard, Robottom (1993) describes a project undertaken in Australia, which demonstrated how difficult it is to be completely faithful to the proposed principles in action research. According to him, participatory research is responsive and contextual rather than pre-ordinate and generalisable. Action research should rather, therefore, seek to be committed to participation, democracy, self-realisation and collaboration.

My own understanding of action research has subsequently changed, in that I now have moved to a more integrated (theoretical and practical) understanding of what the action research process is about. For example, I used to have an assumption that teachers needed skills in critical thinking to be able to participate critically in the process of emancipatory action research. My approach should rather have been to provide the building block ('scaffolding') for critical thinking, instead of expecting people to first have critical thinking skills in order to be able to do environmental education.

The process of professional development through utilising action research as one of its components is a painstaking one. This is mainly due to the fact that the nature of the learning that is involved in action research, namely transformatory as opposed to accumulator knowledge, calls for the need to work through a new understanding of environmental education and its implications very slowly.

5.8 Action research as a method for research

In this section I consider the usefulness of action research as a research methodology for the purposes of this study. I also assess and comment on some of the associated claims and problems in the light of my experiences, focusing particularly on the emancipatory and participatory nature of the research methodology.

Equality is an important aspect of participatory action research (McKernan 1991). Although the democratic nature of action research serves to provide suitable opportunities for the teachers and researchers to work together on an equal basis, in this study, teachers still viewed the process as one where the researcher had to take the lead in the process. The participating teachers had shown that they were capable of forming opinions and making responsible decisions, and they were involved from the start; nonetheless, however, at the initial stages of the project, I had to play a dominant role.

I started understanding that the methodology of critical action research holds immense possibilities as an alternative to traditional, positivistic research. My practical understanding of participatory action research, by actually doing it, helped me to better understand some of the significant differences between it and traditional positivist forms of research:

- Action research provides opportunities to improve social settings, whereas positivistic research does not involve participants to the same extent.

- Action research, further, is aimed at improving a social practice; thus it involves all those responsible for the practice (Carr and Kemmis 1986).

- Lastly, action research is aimed at improving participants'

understandings of both their action and their situation.

In short, the major difference between traditional research and action research is that the former claims to contribute to the body of scientific knowledge, whereas the latter is concerned about practical knowledge in order to bring about an improvement in a situation. Traditional research, consequently, strives to verify facts through objective observation and has gained universal acceptance because research findings are presented as predictable and replicable (Carr and Kemmis 1986:186).

Furthermore, the method of inquiry used in action research differs from the positivistic research mode. Action research usually makes use of the qualitative 'research with' instead of the quantitative 'research on' approach. In this regard, the fact that action research is located within a qualitative research tradition, gave me the theoretical backing to explore processes of interaction and understanding rather than to feel compelled to isolate empirical data.

At the same time however, the very features of qualitative research which make it such a viable method of getting inside situations, also make it susceptible to the charge of subjectivity. An area of concern in this regard is interviewing, especially in terms of the types of questions asked and how these are interpreted. On the point of the researcher influencing the kinds of research questions asked, Robinson (1989:204) says "although this is not necessarily a contradiction within a qualitative research paradigm and is, indeed, not a weakness particular to qualitative research, action research does need to build in some "checks"". I overcame this inherent difficulty through triangulation, and by constantly communicating with the participants as to whether I was interpreting them correctly.

Initially, I found it difficult to work in the action research paradigm. At the beginning, I felt uneasy about teacher

disappointments and low responses, believing that events ought to run smoothly if the research was to be considered as good action research and 'valid'. The uneasiness, I feel, came directly out of my earlier training in positivist research techniques, in which emphasis was laid on controlling variables and isolating research from unpredictable moments. Furthermore, in traditional, scientific research unplanned outcomes are strongly guarded against by minimizing the complexity of the real life situation. As the current research progressed, however, I became aware of the complex array of variables in the educational setting and, indeed, began to value the unintended outcomes and interruptions as useful research data in themselves.

Another problem I experienced in doing qualitative action research with the teachers, was that I did not always feel comfortable about monitoring the research process. I was concerned that the participating teachers would feel that they were being used to further my own academic qualifications, or, alternatively that they would try harder if they were being monitored. As an example of the latter, teacher CA commented on the interest I had shown to involve him in the project and said that he felt guilty if he did not participate in the project or attend meetings.

Then, in analysing the efficacy of action research as a method of research, one has to consider the social context in which action research takes place. In my study, this factor further made me realize that context should not be seen as static or prescriptive in its application. It should be viewed as a process and not a model. According to McNiff (1988:21):

> Action research is never static. The term itself implies a continuous process, a search. It is a process which shows how ones person's ideas develop and may be used by another to move his (sic) ideas forward.

In retrospect, consequently, I do not believe that this project proceeded in the cycles suggested by Lewin and others (McTaggart 1991). The flexible nature of action research allowed for the cycles with the phases to be loosely used. It also allowed for the implementation of new ideas as the process developed, for example, the moment in the research of attending the EEASA conference. This links to the point that Robinson (1989) makes, namely that action research by definition cannot have a tunnel vision of its intentions. She further states that it is important for the researcher to be flexible about the development of the action.

The participating teachers were not particularly interested in the action research method. It appeared to me as if the method followed was not really an issue to them, which leaves the method in the hands of the researcher, who then has to make sure that some principles of action research is followed, for example, as proposed by Robottom 1993 (see section 5.7). I sensed that when I introduced the topic of action research, it was regarded as part of 'theory'. I also sensed that the teachers were used to a specific kind of research setting, in which there is a researcher (me) and those being researched (them).

For the purpose of this study action research worked well. I feel I am now in a position to embark on further programme development for the centre, with my understanding of working from where teachers are, understanding their context and situation and how they understand the situation. My understanding of the teachers was improved through my interactions with them. For example, I realised that the teachers' conversations should not be separated from the research process itself. Their conversations formed part of valuable data gathering. I sometimes felt anxious for not being ready to record significant comments over coffee-breaks, or lacking the time to write extensive notes.

The 'slowness' of action research should be taken into account when doing a project such as this, especially if it is for academic purposes. It is extremely difficult to set deadlines for action research cycles. Researchers need to realise that in this form of research, taking place as it does in real-life as opposed to a laboratory situation, there are multiple factors involved. Some of these include needing to consider every individual's programme, their levels of confidence in themselves, my own mind-set, the particular period in the history of South African education, economic and political decisions, etc. It is therefore impossible to 'run' an action research project 'according to the book'.

Earlier I commented on the difficulty of doing action research in a South African school context (see section 5.2); nonetheless I believe that it is possible to do school-based and inset-based action research in our schools and education system. As this study has shown, the constraints on action research lie in both the material and the subjective constraints that operate at schools. In addition, there are structural as well as power relation problems in education which make it very difficult for teachers to change their practices. But it is also important, I feel, that teachers transcend the subjective constraints existing in their minds, in order to begin participating in at least some processes of change in their practice, perhaps through action research. Action research can provide an opportunity for teachers to collaboratively devise ways of challenging the system and examining their own educational practices, in order to discover the ways in which they are distorted.

Finally, the action research project I embarked on, dealt with real concerns. When the participating teachers and I presented our findings (see section 4.10) to colleagues involved in other environmental education projects, the latter seemed to find the research interesting, and reported that they were very similar to findings in their own practices. It was encouraging to sense

that my research pursuit was not an esoteric exercise. In fact, I feel that the changes I observed in the teachers and myself, far outweighed the benefit of receiving another academic qualification.

By using action research as a process, I have found a means of reflecting critically on my work with teachers and how I understand environmental education and teacher practices. Action research and critical pedagogy have not only influenced how I now see things in my work but have also enriched me in ways which make it easier for me to think and act differently in areas which fall outside my practice. The 'learnings' that emerged from the process have been deeply enhanced by my reading for the thesis itself. In this regard, I was in a more advantaged position than the teachers. However, I feel I still have a considerable way to travel on this journey, but that using action research will enable me to address problems which might arise, should I initiate other projects in the future. Action research has empowered me and provided me with some skills to negotiate and work collaboratively with different people and in different contexts. It has also helped me not only to understand others better, but also myself.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1. Introduction

This research was motivated by what I noticed in teachers'[22] actions and what some teachers told me when they brought their school groups to the Environmental Education and Resources Unit (EERU). Some of them asked me directly how to do environmental education and how one starts doing it. My work at the EERU involved working with teachers in environmental education, and I was concerned to provide them with the best possible support. The overall goal of the project was therefore to do programme development with the teachers, which would be of benefit to both the teachers and the Unit.

My idea of what that programme development had to be changed quite significantly, based on what I learned during the study. Not only did my ideas about the nature of research, in particular socially critical environmental education change, but the study revealed a very clear and rich picture on what really happens at school level, with teachers, in the educational context. It is very important to realise that doing environmental education cannot be separated from what teachers do and experience in the school context; what happens at school affects what teachers do or how they behave.

A participatory action research process was the method employed in this study. However, reflecting on the research after using this method changed many of the assumptions I had held about the meaning and processes of participatory action research before the

[22] These are the teachers who approached the Unit for environmental education programmes or whom I worked with at schools.

start of the action research study.

In the light of the above observations, in this chapter I present a synopsis of the conclusions to the study, and make recommendations, in the light of the research experience, to all the participants. I also summarise the discussion on action research and make recommendations about its application as a research method.

6.2. Conclusions

Environmental education was not, and still is not, at the time of this study, part of the formal curriculum. However, some of the teachers whom I interviewed in this study displayed very positive attitudes towards doing environmental education, and many of them were committed to try and do it. Those who felt committed to implement environmental education, however, felt they lacked the necessary skills on "how to do environmental education". In addition, a closer examination of teachers' comprehension of environmental education revealed that they had their own understanding of the subject, which was mostly related to a study of, and problems in, the biophysical environment, with very few of them making links with social aspects.

It was my understanding that teacher education could help to address this problem of teachers not having a holistic understanding of environmental education. In fact, this particular group of teachers had, early on in the study, identified a need to become involved in teacher development programmes, in order to help them with their practice of environmental education. The participants also thought that an environmental education centre, such as the EERU, could contribute much in supporting them. They had very specific ideas about how this could be done.

The results of the semi-structured interviews reflected that all

the teachers who claimed that they were doing environmental education were, in fact, doing environmental education *in* and *about* the environment, with no real education *for* the environment taking place.

Closer interaction with the teachers revealed that there were both real (objective) constraints which teachers have to deal with, related to socio-economic and political features of the education system (see sections 4.1.2, 4.2.2, 5.2.2, 5.2.3, 5.2.4, 5.2.5 and 5.2.6), as well as perceptual (subjective) constraints in the minds of teachers. Additional factors which contributed to the constraints in practising environmental education include the sense of apathy, uncertainty and helplessness, related to an often unquestioning need for authoritative leadership and direct guidelines from elsewhere for action, exacerbated by a lack of pre- or in-service background in environmental education. An understanding of what socially critical environmental education means in the context of the EERU as it works with these teachers, therefore needs to be seen in conjunction with both the 'realities of schooling' (i.e. what really takes place in the schools) and the mindset of teachers, which results from, interacts with and perpetuates some of these constraints to environmental education.

The practice of socially critical environmental education, then, would imply support, which would help teachers to identify the influence of the education system on them to become the uncritical implementers of a curriculum or mere 'technicians'. Indeed, the very wish and ability to become critical and reflective practitioners, able to participate in debate, deliberation and decision-making, is suppressed by the system.

Despite teachers coming to a better understanding of environmental education, for example, through attending an EEASA conference, and through interacting with each other and with limited literature, their practice - as observed - did not seem

to reflect any significant growth. There was still uncertainty and lack of confidence. In reflecting on this, I concluded that there is a need for interaction between theory and practice, and for more guidance in environmental education for teachers. Teachers' perception of theory as 'jargon' or academic language in this regard needs to addressed.

My own conceptual understanding of socially critical environmental education was clarified, largely through engaging with the literature, the research participants and others, including the research tutor from Rhodes, who assisted me to reflect critically on my actions in the action research process, and those of my colleagues, the teachers. My better understanding is reflected in how I understood and viewed the literature in chapter 2, and how this understanding has further changed between the completion of that chapter and the interpretation of the results in discussion (in chapter 5).

As a result of this deepening of my understanding, I came to realise that socially critical environmental education at the EERU would have to mean working with teachers to help them develop confidence, decision-making skills, a critical perspective, critical knowledge about education and environmental education, the ability to realise that theory and practice are linked and the ability to take action and learn from action (see section 5.4).

This realisation is reflected in the fact that, as the study progressed, a shift in the teachers' responses to top-down decisions imposed on them started to emerge. They started to ask how they could contribute to changes in the curriculum and to call for meetings, and they seemed to find it easier to make decisions related to the project. Instead of relying on others, like the Unit, to do their programmes, the participants started to want to 'do' things for themselves (i.e. wanting to develop their own resources). From this, one can deduce that the

process has become a professional development opportunity for them. A particularly pertinent example here is that of a participating teacher (HM) who, during the study, decided to pursue a post-graduate degree in education and chose to do a module in environmental education. She commented on how her interest in environmental education had grown.

6.3 Recommendations to the participants in the study

Based on the research outcomes as described in chapter 4, and the implications discussed in chapter 5, various recommendations can be suggested for future initiatives in this project. These recommendations, which may also inform similar projects, but which are not to be seen as generalised principles, are as follows:

The teachers in this study should think about ways in which they have become passive implementers or acceptors of the education system and yet, how in small ways, they are also 'actors for change'. The next cycle of the programme development at the EERU should provide more opportunities for questioning our ideas and values. Some ideas that may be challenged are the fact that all 'theory' is the domain of academics or is jargon and separate from practical ideas. This could be addressed through work on a resource file as a focus for exploring how theory and practice inform each other. Another idea to challenge is that teachers have to slavishly implement the curriculum. The next cycle should bring many opportunities for active involvement in curriculum development, and we could utilise the EECI to do so - both learning from it, how to write 'learning programmes' for environmental education and contributing what we have learned and are still learning.

Developing a greater sense of participation in the project, and taking more initiative by acting like people who really 'own' the process, can have implications for educational transformation

too. Engagement in issues which affect teachers can help develop confidence to challenge the authoritarian power relations within the educational system. For example, by acting against authoritarian principals and by not waiting on me, the project initiator, to continue driving our joint project.

Participation in reflection and action in their own teaching setting, or in programme development, can make teachers realize that they do not have to be passive recipients of someone else's knowledge, but that they could be the "producers of educational knowledge" (Walker 1989:9). Once again, the working on a resource file lends itself to the possibility of the participants hopefully taking more ownership of the project. Through such an exercise, they will be contributing their own ideas (old and new), as well as examples of themselves and their colleagues to the resource file.

Participants should jointly and collaboratively address the constraints they impose on themselves and seek ways to surmount these. In this regard, I have found that when the participating teachers interacted and communicated with each other, they learned from each other. Furthermore, it has been interesting to note how in the conversations of people they come to clarity on matters.

To continue working together, as the teachers did in the study, helped to build very good relationships among them. They also started to work on concerns outside of this project. An orientation of this kind would also help to reduce the feelings of isolation, which are so prevalent amongst teachers who try to do environmental education in schools.

6.4. Some conclusions on action research as a method for research

My experience in action research prompts me to suggest that this form of research has enormous potential for growth, and I would

advise others to use this method for academic research or professional development. The recommendations I make, with some caution, are as follows:

In qualitative research the social context of all the participants should be taken into account, as social settings are not fixed. I have learnt, for example, about how school settings change all the time, thereby shifting priorities. Other factors to keep in mind are time constraints, the changing syllabi, etc.

Then there is also the aspect of personal transformation in relation to these changes. It would seem that people generally operate with a very limited knowledge of themselves on a personal level (Davidoff 1993b). This aspect needs to be brought to the fore. It would seem necessary, to my mind, to incorporate the personal aspect into any action research project, so that people can gain greater insight into themselves in relation to their professional life.

Following an action research method can give rise to many unexpected outcomes. These outcomes should all be regarded as data in the process. This aspect places some emphasis on the data collection methods in action research. Facilitators should always be alert to what participants say and why they say it. It is important not to miss anything. However, it is vital to collect data in such a way that participants feel at ease and not as if they are being monitored all the time.

During this study, I found that in this kind of research (i.e. action research) the aspect of 'trust' is an important factor. Participants, in this study, commented on how they felt more comfortable to reveal real feelings about, and experiences of, their settings. Mutual openness is therefore important. Participants should know what the facilitator's intentions are with the process.

An important strength of action research is that it allows for responsiveness to changing social and personal circumstances (i.e. flexibility) and to new insights. Although this is all part of the process, care should be taken, however, not for researchers to be pulled in too many directions and then to 'drown' in data.

Another important benefit of action research lies in its closing the theory-practice gap that exists in the participants' minds. In this regard, however, it is necessary to make participants realise that their understandings of theory as academic language should not be confused with "jargon". The concept of theory might have more than one meaning for teachers.

Action research sometimes leaves the participants uneasy if the process does not proceed and end with the cycles as set out or planned. In this connection, the time aspect is then viewed as a serious limitation. It also often leads to the facilitator wanting to lead the process. The slowness of a project is also a result, and could be indicative of the amount of time that might be necessary for change.

The assumption researchers might have, from reading the literature and others' research reports, that all the participants will 'automatically' participate in the process of action research, needs to be reviewed. I found that it cannot be expected that people suddenly have decision-making skills. It also cannot be assumed that they will be interested in the method per se, so this again means that the researcher will have to take responsibility for this aspect, and to take great care that this does not set her apart from the rest of the group in such a way that it breaks trust.

In summing up, two points must be stressed. Firstly, that to want to use action research as tool to 'achieve' awareness, emancipation, or critical perspectives is to adopt a technicist

approach in qualitative research. This should be guarded against. As mentioned earlier in the project, people experience situations differently with their own understandings of life, and in action research there may always be unintended outcomes. And secondly, the researcher in an action research project is a facilitator and should not view the project as an outsider. It is easy for this to happen given the researcher's advantage of having a better theoretical background or if the other participants expect the facilitator to lead the process all the time.

EPILOGUE

The value of this research lay in its potential for bringing about change in all the participants (both research facilitator and the participating teachers). The greatest benefit of action research is that it takes place within the context of the immediate environment (eg. the school, and in my case, the centre) and society as a whole. It therefore does not stand isolated from the social context in which it happens, meaning it is useful and can contribute to real change. This is a reflection of the fact that people's self awareness is shaped by their experiences in their environment and society; and, likewise, the society is shaped by the way in which people experience themselves.

I think the most significant feature of the project was the growth that took place, away from our original intentions, expectations and plans, and which was mostly as a result of the understandings we developed of ourselves and our situations.

In the introduction to this study I stated that the teachers' intention was to develop a better understanding of how to practice environmental education, while my intention was to involve teachers to become more involved and have some control over what should happen at a centre. We expected to achieve this

by working collaboratively through action research. I could not predict the remarkable effect the process would have on all of us. We had all been accustomed to accept authority, without questioning, and now we were placed in positions to decide for ourselves - we had to discover and contribute to our own learning. The learning which occurred through interaction with each other was another advantage in the process. Teachers could learn from each other that they could overcome the subjective constraints if they really wanted to.

In conclusion, much of what I learnt was also unexpected. I started, above all, to realize the effects of the hidden curriculum, on all of us, in aiding the reproduction of the distorted values and beliefs that constitute the dominant ideology. This, in turn, has renewed my commitment to working with teachers, through an action research framework, to ensure that socially critical environmental education, ultimately, finds its rightful place in our school curriculum.

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APPENDIX 1

The semi-structured interview schedule on teachers' understanding of environmental education and their views on Centres.

1. Are you practising environmental education in your teaching? Why do you regard what you are doing as environmental education?

2. What is your understanding of environmental education.

3. Are you experiencing problems in teaching environmental education?.

4. What would you need to overcome some of these problems or what would you need to help you to make the teaching of environmental education better?

5. Do you make use of Centres (Environmental Education Centres). Which ones?

6. What are your expectations of these Centres?

7. What should the role of teachers be in the design of programmes at centres?

8. Should teachers take their own groups, and run their own programme at Centres? If no or yes, give reasons.

9. Are there any reasons, from your own experience, why teachers do not feel equipped to do the above?

10. If a process is to be set in motion (programme development at Centres) would you like to be interested in being part of it? (Give reasons)

11. What would be the teachers' limitations in such a process?

APPENDIX 2.1

TABLE 4.1 : Participating teachers' descriptions of their environmental education activities.

Interviewees' activities regarded as EE	Frequency mentioned *
1. Taking pupils for visits to Environmental Education centres and on field-trips	7
2. Teaching about ecosystems, ecology and how people interact with ecosystems	4
3. Teaching for awareness and know-ledge of the environment	3
4. Running litter awareness programmes at school	3
5. Teaching about values and responsibility	3
6. Starting recycling programmes at school	2
7. Making links between environmental and social issues	2

* Total frequency from 15 interviewees, some of whom mentioned more than one activity.

(EE = Environmental Education)

APPENDIX 2.2

TABLE 4.2 : Participating teachers' initial understanding of the term environmental education.

Aspects in the understanding of environmental education		Frequency mentioned *
More Limited:	Awareness of environment, eg. flora & fauna	6
	Education about the environment for pupils (rather than everyone)	5
	Ecological studies: "part of Ecology", linked to Ecology syllabus	5
	Education for protection of environment/conserva-tion issues	3
	"Conscientize the illiterate" (awareness)	1
Broader:	People are part of the environment (EE includes the social component)	3
	Linkages between social, economic, biophysical components	2
	Identify and address problems/ involvement	4

* Total frequency from 15 interviewees, some of whom mentioned more than one aspect.

APPENDIX 2.3

TABLE 4.3: Interviewees responses on problems they have in teaching environmental education.

Responses of interviewees on problems in teaching environmental education	Frequency mentioned*
<u>Group with no problems</u> :	
1. Does not have a problem (Environmental education is seen as part of Biology	3
2. Integral part of syllabus)	1
<u>Group with problems</u> :	
3. Problems with excursions: - financial; - time to prepare; - too big groups.	6
4. Teachers lack : background, qualification; in-service development in environmental education; and need a better understanding	5
5. Syllabus does not make provision for teaching environmental education (optional)	5
6. Support of other teachers and principal lacking	4
7. School not ideal for teaching environmental education (eg. hierarchy, funding, no equipment and resources)	3

* Total frequency from 15 interviewees, some of whom mentioned more than one problem.

APPENDIX 2.4

TABLE 4.4 : Assistance teachers require to help overcome problems they have in teaching environmental education.

Assistance teachers require to overcome problems in teaching environmental education	Frequency mentioned *
Teacher education	6
Other teachers to be made aware of environmental education	5
Resources (videos, pamhlets, books)	5
Ongoing teacher support and guidance (eg. workshops)	4
"Expert advice" and a "place" to go to	4
Assistance with field-trips (financial problems)	3

* Total frequency form 15 interviewees, some of whom mentioned more than one issue.

Appendix 2.5

TABLE 4.5:Participating teachers' expectations of centres.

Expectations of centres	Frequency mentioned *
Information on centres and what is available	7
Resources	7
Facilitator; guide; visiting speaker from centre	5
Programmes for children	5
Teacher development programmes	4
Closer link between centre and school	3
Workshops	2
Newsletters on developments	1
Awareness programmes and campaigns	1
Programmes which cannot be done in the classroom	1
More guidance	1

* Total frequency out of 15 interviewees, some of whom mentioned more than one issue.

APPENDIX 3

RESULTS OF SEMI-STRUCTURED INTERVIEWS

SUMMARY OF KEY POINTS

ENVIRONMENTAL EDUCATION

MAIN REASONS WHY TEACHERS FELT THEY WERE DOING

1. Teach about ecosystems, and how people interact with ecosystems
2. Visit centres and go on field-trips
3. Teach more than what is required in the syllabus and relate it to the child's immediate environment
4. Are involve in other projects such as recycling and litter awareness

TEACHERS' UNDERSTANDING OF ENVIRONMENTAL EDUCATION

1. Interaction of people and the environment; inter-dependence of organisms
2. Awareness and conservation (i.e. to protect the environment)
3. It is a broad field which has to do with economic, social, political and natural environment (it should be related to the child's immediate environment)
4. To identify problems in the environment and to take action
5. To change attitudes of children, and also to instill values

PROBLEMS TEACHERS HAVE IN TEACHING ENVIRONMENTAL EDUCATION

1. Teachers need background in environmental education; lack the necessary qualification; they need in-service development; better understanding
2. Support of other teachers (and principal) lacking
3. School set-up not ideal for the teaching of environmental education
4. Syllabus does not make provision for teaching environmental education
5. Problems with finance, eg. when they want to go on field-trips
6. Teachers who do not have a problem with teaching environmental education see it as part of Biology. Another saw it as integrated in all her teaching, the syllabus

ASSISTANCE REQUIRED TO OVERCOME PROBLEMS IN TEACHING ENVIRONMENTAL EDUCATION

1. Teacher education
2. Other teachers also need to be made aware and give their support
3. Expert advice and a place to go to
4. Resources to help them
5. Assistance w.r.t. excursions and field-trips (eg. finance, etc.)

EXPECTATIONS TEACHERS HAVE OF CENTRES

1. Information on what is available at centres
2. Facilitator/visiting speaker/guide from centre
3. Programmes on how to do their own programmes
4. Resources
5. Closer interaction between the centre and school
6. Basic programmes for the children (not too academic)
7. Teacher education programmes
8. Newsletter (ongoing communication from centre)

THE ROLE OF TEACHERS IN THE DESIGN OF PROGRAMMES AT CENTRES

1. Teachers should be involved in the design of programmes at centres,
   - the teacher know at what stage the child is in his/her development,
   - teacher has a better understanding of the child
2. Teacher knows what important aspects to related to the syllabus
3. Important for teacher to be involved to ensure ownership, better usage of programmes and participation in the programme

REASONS WHY TEACHERS SHOULD/SHOULD NOT DO THEIR OWN PROGRAMMES

1. Teachers have too little time to prepare
2. Children listen better to someone else (tired of hearing teacher)
3. Teacher do not know how to do programmes
4. Teacher not always familiar with the set-up / facility
5. Sometimes a specialist is needed
6. It should work both ways - sometimes the teacher should present and other times the centre staff
7. Initially the centre staff should present but later teachers should take their own groups
8. Education officer should prepare a self-guide / brochure for passing on
9. Groups of teachers could present / run programmes
10. Teacher should be involved especially in groups with discipline problems

REASONS WHY TEACHERS ARE NOT EQUIPPED TO DO THEIR OWN PROGRAMMES

1. They do not have the necessary background, need a course in environmental education
2. Feel intimidated
3. Scared, expert at centre can rather do programme
4. Teachers' knowledge is limited, did not receive the relevant information in their education; whole education system is a problem
5. Teaching difficult; teachers are overworked - heavy workload; classes too big

REASONS FOR WANTING TO BE PART OF THE PROCESS TO ADDRESS ISSUES MENTIONED EARLIER

1. Awareness of recent developments will be promoted
2. Knowledge can be gained through the interaction with other people
3. Wants to know more
4. Will help teacher with programmes for children

LIMITATIONS TO SUCH A PROGRESS

1. - Time

APPENDIX 4

TABLE 4.6: Issues listed by participants and suggested plans of action (EE = environmental education)

Issues listed				
Group 1a	Group 1b	Group 2a	Group 2b	Group 2c
1. Socio-economic problems - to be addressed first.	1. Need for teacher development workshops in the light of EE being a new concept.	1. Need for teacher development programmes.	1. Need for Teacher development. Need for the empowerment of teachers through skills workshops.	1. Lack of interest in EE among other teachers.
2. Syllabus does not allow for extra work eg. EE	2. EE to be an integral part of syllabus in all subjects.	2. Lack of awareness of EE and knowledge among teachers (in Primary and Secondary School).	2. Teacher lack time to do EE.	2. Attitudes and values of teachers and pupils a problem.
3. EE should become part of a subject or course.	3. Centre to go to schools more often (to address misconception that the environment is out there in nature reserves).	3. Lack of knowledge on how to use the school grounds and local environment for teaching/education.	3. Subject advisors are not supportive enough to implement EE in schools.	3. Teacher development and skills lacking.
4. Overcrowded classes (up to 40 pupils in class).		4. Lack of resources (eg. gardens) at school.	4. EE is not used to promote integrated studies at school.	4. Lack of confidence among teachers to try new ideas (especially with new syllabus).
5. EE is not relevant to a child's daily life.				5. Problems with field trips for large groups; organisation, expenses and time involved.

Suggested plans of action

Group 1a

1. Centre staff should visit school;, not all teachers can visit centres.
2. Centre must help to change syllabus.
3. Authorities should make EE part of all subjects.
4. Teachers need guidance to incorporate EE.
5. Other teachers not aware of EE - need a programme for all teachers at school.
6 EE should teach about relevant issues eg. litter instead of ozone.
7. Centre should be a resource and provide information (eg. videos).
8. Joint projects between school and Centre suggested.
9. Centre should work individually with schools.

Group 1b

1. Teacher development programmes needed.
2. Workshops are needed to involve teachers from all subject areas in EE, not only Science teachers.
3. Centre should reach out to schools.
4. Worksheets / practicals / exam questions relating to EE.

Group 2a

* Integrated plan of action required because issues are interrelated.

1. Teacher development is required.
2. Skills development in EE is needed.
3. Do ongoing workshops - small workshops with interested teachers who then have to report back to other staff.
4. Unit should invite teachers so that they can familiarise themselves with unit's resources.
5. Resources - to be developed by the Unit should be based on teachers' needs and the syllabus.

Group 2b

1. Skills workshop for committed teachers on:
   - awareness of centre
   - resources available
   - how to do worksheets
   - how teachers can become facilitators for other teachers.
2. User-friendly programmes to be designed at centre.
3. Workshops with centre staff to set up programmes for teachers which can be used at the centre.
4. Centre to be marketed as a cross-curricular facility for EE. Active field workers needed to market the centre.

Group 2c

1. Unit should visit schools to discuss topics:
   - What is EE;
   - What are the available resources;
   - How to improve the school environment.
2. Teacher development needed, eg.:
   - Organise interested teachers who will help draw up a programme which can be used by other teachers (ongoing);
   - Guidelines for outdoor activities to be formulated (skills, etc.);
   - Pupils should be involved in testing the pilot programmes.

APPENDIX 5

EEASA '95 PROGRAMME

DAY ONE TUESDAY 18 JULY 1995

8.00 - 9.30	9.30 - 10.30	TEA	11.00 - 12.00	12.00 - 1.00	LUNCH	2.00-3.30	TEA	4.00 - 5.0
PLENARY VENUE 1 Choir *Welcome* **EEASA** *Welcome from President Mandela* *Welcome from Government* **Ministry of Education & Training** *Opening Address* **Mike Tagg** **Gold Fields Foundation** *Introduction of the conference theme: Progress & Paradox* **Zureta Janse van Rensburg** *Announcements* **Jim Taylor**	**PANEL SESSION 1:RETHINKING EE** VENUE 1 Chair: Maria Mbengashe *The Unsustainability of "Sustainable Development"* **Nelleke Bak** *Leaving "Behaviour" Behind: An Alternative American Perspective on Environmental Action* **Katherine Emmons** *OR* **PANEL SESSION 2:RECONSTRUCTION AND EE** VENUE 9 Chair: Albert Mfenyana *The Roles of Environmental Educationists as Change Agents in Community Development* **Axel Jooste** *A Role for EE in the Process of Educational Reconstruction in South Africa* **Danie Schreuder** *OR* **PANEL SESSION 3: RESEARCH AND EE** VENUE 7 Chair: Ursula van Harmelen *Resource Development in EE : Exploring some of the Myths and Tensions in Participatory Resource Development* **Heila Lotz** *Delusions of Progress: Reconceptualising EE* **Malcolm Plant**		**WORKSHOP SESSION 1** *Exploring EE(An Introduction)* **Nicky Schoeman** VENUE 4 *OR* *Non-racialism and Affirmative Action in Outreach Programmes* **Mohale Thoka** VENUE 5 *OR* *Industrial Theatre* **Rina van der Watt & Andre Stolz** VENUE 1 *OR* *Mythical Mr. Average: Eco-Access* **Rob Filmer, Julie Filmer & Sandy Heyman** VENUE 2 *OR* *Reaching Out : A Model of Professional Development for Teachers in the Field of Education for Sustainability* **John Huckle & Phil Champain** VENUE 9	**WORKSHOP SESSION 2** *Paradigms in EE: An African Perspective* **Oupa Lebeloane** VENUE 4 *OR* *A Department of Environmental Affairs and Tourism Resource to Explain Sustainability* **Willeen Olivier** VENUE 5		**MARKET PLACE** VENUE 1		*WORKSHOP SESSION 3* *ECOSA Repo Back* **Paul Vare** VENUE 9 *OR* *Interpreti Trails - Their Relevance Now?* **John Roff** VENUE 4 *OR* *EE in Pre and Primar Schools: Themes, Syllabus, Resources and Suppor* **Jeanette Stewart** VENUE 3 *OR* *Teaching Screens: Evaluation of a video* **Alistair Clacherty** **Robyn Hofmeyr** VENUE 1 *OR* *Why Do Projects Never Turn Out as Planned?* **Peter Hill** VENUE 2

DAY TWO WEDNESDAY 19 JULY 1995

8.00 9.00	9.00 - 9.30	9.30 - 10.30	TEA	11.00 - 12.00	12.00 - 1.00	LUNCH	2.00 - 5.00
PLENARY *VENUE 1* *Short Country reports* **Various speakers**	*PAPERS* *Cultivating a National Strategy for EE: A Grower's Guide* **John Smyth** VENUE 1 *OR* *Environmental Education in formal education: the case of Botswana* **Mokgwetsi Masisi** VENUE 9 *OR* *Ecoliteracy, the University and the R.D.P.* **Stanley Frielick** VENUE 6 *The Scientists Will Save the World : EE in an Alienated Society* **Jaap Ruiper** VENUE 2 *OR* *EE vs. Extension: The Way Forward* **Johan Jodenstein** *VENUE 7* *OR* *Experiences of a Community Worker* **Mathilda Roos** *VENUE 6*	*WORKSHOP 1* *Research in EE in South Africa* **Pat Irwin** *VENUE 1* *OR* *Issues- or Enquiry-based Teaching for the Environment* **Debbie Heck** *VENUE 9* *OR* *EE in Agricultural Education* **Pumla Pholo** *VENUE 2* *OR* *Marine Education in South Africa* **Judy Mann & Tom Heinsken** *VENUE 3* *OR* *Water : Participatory Resource Materials* **Fenny Gumede, Steve Camp, Bongi Thabede** *VENUE 4* *OR* *A Mystical Journey through EE in Namibia* **Judy Storm and Namibian EE Network** *VENUE 5*	TEA	*WORKSHOP 2* *How Do We Think of Human-Nature Relationships? Making Sense of Interview-based Research Methods.* **Alistair Robertson** *VENUE 9* *OR* *Whole School, Whole Environment.* **Sue Spies & Nicky Reay** *VENUE 1* *OR* *When is a Centre a Centre? Towards Contextualising EE Centres in Implementing EE in South Africa.* **Ursula van Harmelen** *VENUE 2* *OR* *Accessing the Airwaves : Using Radio for EE.* **Hugh Tyrrell** *VENUE 3* *OR* *EE in Australian Schools* **Helen Sharp** *VENUE 4*	*WORKSHOP 3* *The ESPI, What Do WE Do on the Morning After the Night Before?* **Alistair Clacherty** *VENUE 1* *OR* *EE for Tanzania : A Success Story.* **Mary Shuma** *VENUE 2* *OR* *Action Magazine: an Appropriate Medium for Introducing Environment & Health Issues to Rural Youth in S.A.* **Steve Murray** *VENUE 9* *OR* *EE Through the Eyes of Children : Puppets in Practice* **Cheryl Ogilvie** *VENUE 3* *OR* *EE & Training in Industry - Does it Work?* **Arend Hoogervorst** *VENUE 4*	LUNCH	**EXCURSIONS**

APPENDIX 5

EEASA '95 PROGRAMME

DAY THREE THURSDAY 20 JULY 1995

8.00 - 9.00	9.00 - 9.30	9.30 - 10.30	TEA	11.00 - 12.00	12.00 - 1.00	LUNCH	2.00 - 5.00
PLENARY VENUE 1 Connecting Theory and Practice in Education for Sustainability: Progress & Paradox John Huckle	PAPER 1 The Paradox of Pedagogy Transposition : What can be Learned from Inhibitors to Change? Kathy Greaves Stiles VENUE 1 OR Paradoxical Needs in South Africa: A Situational Approach in Solving Environmental Problems Attie Botha VENUE 2 OR An Agnostic Stance to Knowledge within EE Roger Firth Venue 9 OR What Role Should EE Fulfill in the New S.A.? Lucliaire Lirey VENUE4 OR Problem-solving in EE Kantilal Parshotam VENUE 5 OR Socio-Economic Development and Preservation in Africa : The Critical Role of EE Anne K. Kinyua VENUE3	WORKSHOP 1 Enviro-Pictures INSET Resource Pack Rob O'Donoghue VENUE 1 OR Using Ergonomics to Improve the Living Environment : A Case Report on Distance Learning Experiences at UNISA. William Williams & Theo de Koker VENUE 5 OR EE in Agricultural Education (cont'd.) Pumla Pholo VENUE 2 OR Plastics in the Environment Shadrack Madingwane VENUE 9 OR The Macro-politics of the Environment and an "a-political" EEASA Tsepo Mokuku VENUE 4	TEA	WORKSHOP 2 Enviroteach - Experimenting With Cross Curricular EE in Namibia Derick Du Toit, Teresa Squarzin & Silas Shakuru VENUE 4 OR Stories of South African EE : An EEPI/EEASA Publication Glynis Clacherty & Heila Lotz VENUE 3 OR Volunteer Education Officer Programmes Ally Ashwell & Judy Mann VENUE 5	WORKSHOP 3 Environmental Ethics : Values in and Duties to the Natural World Holmes Rolston III VENUE 3 OR Environment Clubs and Share-Net: Exploring Low-Cost Resources to Support both Clubs and EE Activities Clare Holland VENUE 4 OR Life Science : A Modern EE Subject at Junior Secondary level in Namibia Soren Mark Jensen and Cliff Olivier VENUE 6	LUNCH	EXCURSIONS
				Indigenous Knowledge Mba Mangele & Barrie Barnes VENUE 1 OR Coastal Conservation video C.M.A.P. VENUE 9 OR Curricula for Conservation Colleges and Distance Education Courses VENUE 2 Jim Taylor, Pippa Heylings, Joe Venter, Lynette van Rensburg & Doo Shongwe			

DAY FOUR FRIDAY JULY 1995 21 JULY 1995

8.00 - 9.00	9.00 - 10.30	TEA	11.00 - 12.00	12.00 - 1.00	LUNCH
PLENARY VENUE 1 Resources, Networking & the Road Ahead Share-Net: Case Studies in a Risk Society Jim Taylor	EEASA AGM Annual General Meeting VENUE 1	TEA	MARKET PLACE VENUE 1	PLENARY VENUE 1 Thank-you's Closure	LUNCH

APPENDIX 6

TEACHERS REPORTS AFTER ATTENDING THE 1995 EEASA CONFERENCE

APPENDIX 6.1

EEASA Conference Durban

18 - 21 July 1995

Mrs B Fernandez
Sibelius High School

A number of different workshops were presented to us during the course of the conference. Some workshops were, in my opinion far too theoretical and intellectual, and were of very little value to me as a teacher and as a person interested in Environmental Education(EE).

Many other workshops on the other hand were very interesting to say the least; eg. EE in Namibia where they experimented with Cross-curricular Environmental Education. They changed the emphasis from teacher-centred and text book centred lessons to Learner Centred education.
Instead of memorization of facts, they are involved with Activities based on Understanding. Pupils are encouraged to have an integrated approach to education and not regard education as being Subject based.
Instead of Learning for an examination, they adopted the Locally Relevant approach. Many of Namibia's problems appear to be very similar to ours and I am sure that we can learn from their experiences in changing the Education system with regard to EE.

EE in Tanzania spelled another Success story, where they had specific problems like Soil Erosion, Deforestation, they were able to educate the community to overcome these problems by starting a Tree-Nursery and by making their own charcoal. They made their own charcoal by using their area's natural resources: Mlenda plant is a gluey bulbuous plant, Ash; Soil; Water. In effect, they satisfied their own needs without

degrading the environment. What is also of particular interest is that teachers realized their responsibilities and initiated many activities like school gardens, collection of seeds, etc.

EE in Australia has many major problems which need to be addressed. Teachers did not know How to take Action in EE. They did not see EE as a priority. People have difficulty in defining EE. They have an over-crowded curriculum. They say that they have too much to do. These problems sound very similar to our South African problems. We need to develop a New Approach, attitude.

A very controversial workshop I attended was:
"What Role should EE fulfil in the new South Africa"
Luclaire Airoy identified a few problems with EE presently in South Africa: She says that:

a. We have no adult education
b. We create Environmental awareness not Environmental Education
c. Non-participatory approach
d. Programmes take place away from own environment
e. We have no follow up ... pupils do not go back
f. We are using a Euro-Western Approach

She believes that the solutions could be the following:

1. We should live with the community
2. Increase adult emphasis
3. Train the trainer
4. Determine what they want and what they need

I would like to discuss this workshop further with some people who attended it.

The workshop on "Environmental Clubs and ShareNet" was very useful in terms of resources, contact persons, and the formation of Environmental Clubs at schools. It made me realize that net-working in EE is very important.

"Marine Education in South Africa " - This workshop made me realize that we are not utilizing our resources effectively at all. My school is situated 3,5km from the coast, but the Environmental Club has only visited the Rocky Shores once. Even though our pupils visit the beach on a daily basis during summer, we should do more work in this area. Many contact numbers were exchanged during this workshop and hopefully it will lead to more effective Environmental Education.

Axel Jooste delivered a paper on: "Reconstruction and EE". He stated very clearly that the Community and not the Environmental Educationist should take the leading role in decision making. That we should work with the people and not assume to know everything about the people's community. Environmental Educationist should not impose their ideas, they must assist, they must not cut people out in their attempt to rush projects. The people must determine the pace.

Many of these points are very relevant and have broadened my scope of Environmental Education. Previously, I think I was quite narrow in my views and now feel better equipped to deal with Environmental Education.

APPENDIX 6.2

REPORT: CONRAD ADENDORFF

KLEINVLEI SSS

EEASA CONFERENCE 18 - 21 JULY 1995

First of all, I would like to inform you that my perception of Environmental Education (EE) was very narrow. The basic idea I had was that EE was about teaching people about the biotic components, how they integrate it, and how they identify it. I could not see how 'recycling', indigenous gardening, etc. fits in with EE.

After the first workshop, 'Exploring EE (an introduction) my perception broadened. Nicky and Sue indicated how social, economic and political aspects also play a role in the environment. I have never thought about EE in this way. The goals of EE that were highlighted had a great influence on my personal goals with regard to EE. The time, however, did not allow for further discussion about the goals.

Another interesting workshop was the one on 'Paradigms in EE' - an African perspective. It was not presented very well. I feel that the workshop presenter could have presented positivistic, interpretative and critical paradigms in a better way. Here my meta-theory helped me and the discussion was beneficial on which theory was applicable to EE. Once again the time was inadequate and many others still did not know what the discussion was about.

Some of the workshops were not well presented. Presenters delivered lectures and there was too little time for discussion. I feel more time had to be allocated for the

workshops. Many times I felt frustrated at the end of a workshop because there were so many other ideas I wanted to share and discuss.

The workshop - 'EE through the eyes of the children' was very exciting. I am planning to take the Std. 6's and 7's next year and here I got good ideas on how to implement EE with children. Children learn better by playing.

The excursions were very good and with the one to Valley Trust, one could experience the practical implications of EE. Here, in particular, I could see that EE is much broader than I thought. The week also inspired me to see that EE functions at a national and international level. It was exciting to meet all the different people and to exchange ideas. Basically I was surprised to discover that EE covers such a wide field. In one workshop someone indicated that we even have to look at Space (just show how far it stretches).

What I have learnt during the week at EEASA I will try and implement to the best of my ability at school and in the community. Now I can understand better how 'recycling, gangsterism' (to give a few examples) fit in with EE. I enjoyed everything, even the group interaction and hope this forum will be successful.

Many thanks to the sponsors of the project. I appreciate being part of the teachers forum and learnt so much.

APPENDIX 6.3

Report on EEASA Conference

Mr D Roman

My fantasy of extending the mid-year holiday on the Durban beach front, scrutinising and socialising with other holiday-makers was shattered by:

1. cold unpleasant weather conditions for most of the period associated with a "stubborn", resistant cold virus which somehow seemed to have found a comfortable home in my body;

2. An intense, though provoking informative experience of Environmental Education at micro and macro levels. These sessions ultimately caused a spontaneous perspective transformation with regards to:

   2.1 the concept of E E
   2.2 the factors contributing or hinder E E
   2.3 the impact E E has on individuals of communities, and its pivotal influences on the economy and politics (eg. contribution to the democratization process (RDP) in changing countries as RSA).
   2.4 the cardinal concept of sustainability of the optimum number of individuals in respective populations (of organisms) within communities.

   Parties whom have contributed successfully to my sincere appreciation of the conference were:

1. our group of EERU subjects who befriended each other within a short span of time. The close-netted integration and interaction amongst us provided the

required stimulus to attend lectures, workshops and excursions with coinciding constructive discussion on various topics.

2. the lecture of Mokgewetsi Masisi, Senior educational officer for the social studies curriculum in the curr. development and evaluation of the Botswana Ministry of Education His vibrant presentation of their experience to infuse E E in the already established disciplines of formal education needs to be honoured. In spite of severe time constraints, he managed (in my opinion) to enlighten us adequately about the state of affairs in Botswana and possible implications in the South African E E content.

3. Tsepo Mokuku's informative workshop orientated session reflecting on environmental problems experienced by Lesotho as a result of:
   (i) constant change in government related to intolerant political behaviour
   (ii) authoritarian governing with less or no concern with E E
   (iii) major technological advancement (eg. Lesotho hydro-electrical project) without prior impact studies or outcries from concerned groups or individuals from within Lesotho. I detected a subtle plea from Tsepo, which I echo, to request EEASA to adopt a more revolutionary, assertive contributory role in the resolution of such national issues which violates, social justice, peace and the harmony of the environment. A request that EEASA regional or provincial branches should be established was favourably entertained to identify and campaign ecologically deranged projects or exploitive political activity.

4. Kantilal Parshotam's (Academic developer in the Medical facility at Wits) impressive account of E E projects based on problem-solving in Australia; Issue investigation in America 1990. I could associate with his sustained argument from a school of thought which underpins the following:

(a) people will change in attitude/behaviour if their respective thinking is altered;

(b) E E projects or activities must be structured so that individuals are channelled into reflective thinking about the environment and their contribution;

(c) knowledge is individually and/or socially designed;

(d) the consent of individuals within a community is a prerequisite for the initiation of E E projects or activities.

5. The Happy Valley Project (a socio-economic project of the Happy Valley Trust - NGO) was shown to us as a successful E E project which was based on prior mentioned criteria towards community upliftment. A learning experience here was the practising of E E within the immediate environment of the people who need to be uplifted with projects approved by them. They experience problems though eg. minor theft, political intolerance etc. but they have shown considerable results.

E E contribution in the reconstruction of the socially damaged new South African society is cardinal. Without its infused contribution in the curricula, progress to social justice and ecological stability would remain at a distance.

APPENDIX 6.4

REPORT: EEASA CONFERENCE 18 - 21 JULY 1995

MR D FULLARD

WESTRIDGE SS

The conference, which was presented as a series of lectures and workshops was an extremely privileged opportunity for me as a Secondary School teacher to be exposed to the range of ideas, perspectives and experiences of people involved in environmental education . What was striking to me was the fact that people of all walks of life were present at the conference.

I went to the conference with, what I thought was a fair idea/understanding of what EE was about. My knowledge of EE included awareness of the environment (both the bio-physical factors and to a lesser extent the socio-economic conditions) and was essentially based upon or limited to the formal education set-up. By being part of the conference I realised and discovered the EE is not confined to classrooms/schools or environmental clubs, etc. but is much broader than I thought and involves a greater spectrum of people and organisations.

I attended a few lecturers and workshops which broadened my views on EE considerably. A view of EE that I have not given much thought was the socio-economic and political/cultural perspectives. Two important views made an impression on me at the conference and that is that "EE can play a role in creating a democratic life for all and incorporates citizen building". Another view which I also feel strong about was the fact that the environment is IN the people and that it shouldn't be taken away from the people especially by intellectual academics within

EE fold. I realised that community development through EE was given great interest and throughout focus was placed on sustainable development/living.

Besides giving me some new perspectives, the workshops specifically gave me new ideas w.r.t. teaching practice and approaches to EE. The following workshops were particularly interesting and helpful.

Topics:
- Exploring EE (An Introduction)
- Whole school, whole environment
- EE through the eyes of children
- Issues - or enquiry - based teaching for the Environment
- Enviro-Pictures Inset Resource Pack
- Enviro-Teach (Cross-curricular in Namibia)
- Life Science (An EE subject in Namibia)

Through interaction during workshops I could learn from other's experiences, their successes and failures which in some cases provided some solutions to problems/constraints which we might experience. I was also inspired by the commitment of some people who have experienced tremendous difficulties, but succeeded despite.

I found the idea of Life Science as a subject in Namibia very interesting, especially the textbooks they use. It contains material which is relevant to the learners lives. Everything in the books relate to Namibia, so learners can directly associate with it. The resources displayed and the workshops where the use of these resources was practically explained was a benefit. Resources are readily available and valuable contacts were established. "Whole school, whole environment" emphasized the importance of involving the local community before starting outdoor projects (such as school-gardens) at schools. Issues - or Enquiry based teaching and Enviro-Teach focussed on the shift of teacher-centred to learner-centred approach to teaching.

Criticisms against the conference could include the following:

- The time allocated to the workshops was inadequate. The time allocated did not allow for proper interaction, discussion and debate.

- I experienced that in some sessions academics and intellectuals tend to dominate discussion.

However, on the whole, the conference was a great success to me because it inspired me and gave me hope for the future.

APPENDIX 6.5

REPORT: H. MELVILLE

BELHAR SSS

KEARSNEY COLLEGE, 18 - 21 JULY 1995

The conference, in general, was well organised and as teachers we felt immediately at home.

Valuable contacts were established and many resources were collected which can be used in the education of pupils in EE. The concept of EE was broadened for me and my perception now includes:

- The education of the educator;
- The development of resources to protect the environment, eg. Mary Shuma's success story in Tanzania;
- The development of simple things like cartoon strips (Willem Olivier) which can contribute to the awareness of our environment;
- The continuous support and collaboration with people involved in the field.

We have met people who are actively working in the field and who can support you as a teacher to make your task easier. The session on marine education was in particular very useful because so many people attended and this, no doubt contributed to the further development of marine biology. I especially became aware of the importance of our beaches and that there is a lot to learn about this. It was an

eye opener to see that the intellectuals and academic (who are always far removed) could work so well with the teachers. We did not feel intimidated by them.

The workshops were definitely too short and in many cases we could not really get to the important points. There was also not always enough time for questions. There was a great variety of workshops and I would have loved to attend more of them, especially those which had to do with the development of EE. By attending the workshops which had to do with EE in various countries, made me realise that EE is dynamic and regarded in a serious light all around the world.

Some papers delivered, eg. by John Huckle were too academic and I found it difficult to follow (subjective).

The experience further gained out of this experience is that the group of teachers (this forum) worked well together and in the future it would be easier to help each other. It was especially beneficial as teachers to have discussions throughout the conference.

My thanks to the people who made it possible.

APPENDIX 6.6

EEASA CONFERENCE REPORT

KEVIN HENDERSON

The message from President Mandela, was especially inspiring, since it demonstrated some interest in environmental education (EE), shown by the government. This in itself is important, since a good relationship between the government and NGO's are important for EE.

The idea of having such a wide variety of panel discussions and workshops, are quite noble, but in reality it wasn't practical. Sometimes a person wanted to attend two workshops that were running concurrently. Another aspect that needed much attention was the fact, that the amount of time allocated to most of the workshops, were not sufficient. This led to the workshop not coming to its full potential, especially with reference to the amount of time available for discussion.

Another problem with the conference, was the amount of academic papers presented, where a lot of difficult terms and concepts were used. The idea of having the conference at Kearsny College, was that it should be affordable enough for a lot of people coming from all walks of life. By using EE and academic jargon, the academics are killing EE, especially amongst people who do not have academic backgrounds. From a teaching perspective, the following workshops and papers were of great value:

1. Environmental Education in formal education:
   The case of Botswana.
   In Botswana, they develop a multidisciplinary approach to EE. They did this by means of integration and infusion. This implies, that the EE objectives were not

only integrated in the different subjects, but it also becomes absorbed into the subject. To my knowledge this is the most effective way of doing EE, since it is easier to develop new ideas with children. By this it is hoped, that the message will be carried over to elder people as well.

2. Issues - on Enquiry - based teaching for the environment, was also beneficial, since it helps teachers to develop a methodology for teaching EE. Children learn faster when they develop and experience their own ideas, with regards to EE. This method propagates the idea, that children should identify an environmental problem, and develop ways of combatting this problem themselves.

3. EE through the eyes of Children:
   Puppets in Practice:
   This was to my knowledge the best workshop of the conference. It has shown teachers how to teach EE in a very real and practical way. Puppets are very efficient for small children, but with high school students, music can be used. I recall the way that voter education has been done in high schools students when the rap group (POC) was used. I would strongly suggest, that this means should also be used with high school kids to do EE.

Lastly, I would suggest, that we in South Africa can borrow a lot from Namibia and Botswana with regards to EE. I would also like to suggest, that people from the E.E.R.U. (U W C) should also present a workshop or paper at the next conference.

APPENDIX 6.7

REPORT: M LINTNAAR
EXCELSIOR SSS

My best and sincerest thanks to the sponsor Shell who made it possible for us as teachers to attend this conference - what an adventure!

I will summarize my report by giving an account of all the different workshops attended.

Axel Jooste did well by presenting "The Role of Environmental Education as changing agents in community development". His emphasis was mainly on the skills required to initiate the above. A lot of the things/issues he mentioned are familiar, but it is still issues which one tend to overlook in your busy programme. In his effort, he made people aware of their conscience. Further, he also succeeded in bringing across new ideas. (The Main hall was inadequate for this talk. Its size made successful presentation difficult).

Danie Schreuder presented the Role of EE in the Process of Educational Reconstruction. What Dr Schreuder tried to present appeared to be a good effort, but unfortunately I could not follow because he spoke too softly and the overhead transparencies were illegible (writing too small).

"Exploring EE' was presented by Nicky Schoeman. This was a lively presentation. She succeeded well in presenting the complexity of EE. Her workshop also made me as a teacher realize what to do and what you could still do. There was no time to ask questions or have discussions. I think this would have concluded the workshop well. Personally, I would have preferred to have more time in this workshop session because there were so many unanswered questions.

'Sustainability' was presented by Willeen Olivier. This was valuable in the sense that it showed a different way to present to pupils (at schools), those interested or even people not interested the concept of Sustainability. She definitely achieved her goal. Her presentation was in the form of a story. She also allowed people to make suggestions in order to improve the story or improve the presentation thereof. This was a fantastic workshop.

Jaap Kuiper presented 'Will scientists save the world. EE alienation'. It was difficult to figure out what he wanted to bring across. He highlighted the 'myths' of Science. Nothing could be learnt from this workshop.

'Whole school, whole environment' was presented by Sue Spies and Wicky Reay'. This workshop made me realize how privileged I am in my own community. And to think I allowed myself to become despondent because of the community I teach in. This workshop gave me the courage to carry on again. These two workers, despite their difficulties where they work, continue and only succeed now and then. The lesson learnt is not to give up, but to carry on.

EE through the eyes of children by C. Ogilvie was very educational. New methods and techniques were discovered to present and to make your work presentable to children. A good workshop that was attended.

'Excursion' Safari and Zulus

The excursion to Safari-land can be regarded as a waste of time. At the Zulu farm, however, one could learn something about the culture of the Zulus. I would recommend that the excursion be replaced with something more educational.

Luclaire Rizey presented the 'Role of EE in South Africa'. She presented a very realistic view on EE in South Africa. She posed many questions on the practice of EE. Is what we regard as EE really EE? Is the way it is presented to the community really

the right way? She highlighted many problems she is experiencing in Natal. Many people tend to ignore the problems because they think their way of doing is right. She even questioned her own way of doing. I would, however like to highlight the following that she brought across:

- Be realistic and try to present EE to your community in a healthy, realistic manner.

To me it was a very informative workshop. Although the workshop had to last one session, the presentation ran over two sessions.

Cross curriculum EE in Namibia

The time was too little to get an holistic idea of what exactly was going on. Nevertheless, what was done in Namibia is a good indication of what is needed in South Africa.

'E E Clubs - Share Net'

Very informative. New contacts were established. This workshop highlighted some of the mistakes I made as a teacher.

Excursion - Vally Trust

This was a fantastic experience. I want to start my own compost-heap back home.

Concluding remarks:

In general, the week was a great success. I have learnt a lot, new contacts were established and I was motivated and encouraged to start projects which I never even thought I would have started on my own.

APPENDIX 7.1

TABLE 4.7 : Teachers' understanding of environmental education after attending the EEASA workshop.

Aspects in the understanding of environmental education, as reported by teachers who attended the EEASA workshop	Frequency mentioned *
Include physical, social and economic factors	4
Education for sustainability	4
Education about importance of environment	2
Action to improve environment	1
Importance of local and global environment	1
It is the education of educators	1
The development of resources about importance and protection of environment	1
EE should be a life-long process	1
Connectedness between people, organisms and environment	1
Concept too big to define	1

* Total frequency out of eight teachers who attended the workshop, some of whom mentioned more than one aspect.

APPENDIX 7.2

TABLE 4.8 : The understanding of environmental education of teachers who did not attend the EEASA conference.

Aspects in the understanding environmental education of teachers who did not attend the EEASA conference	Frequency mentioned *
Conservation and protection	2
To improve the quality of life of people, animals and environment	1
People to value living in harmony with environment	1
Relation between people and environment; how environment affects people	1
Awareness that people are part of environment	1
Action to improve environment	1
Education about immediate environment	1

* Four teachers did not attend the EEASA workshop but wanted to remain part of the research programme. This table reflects their responses to the term environmental education. Some mentioned more than one aspect. The above table also includes the response of a teacher who only joined the group at this stage of the research.

APPENDIX 8

CLARIFICATION OF ENVIRONMENTAL EDUCATION

TABLE 4.9

NAME	1st INTERVIEW	2nd WORKSHOP	THE BASIC PROBLEM IN THE WORLD ECOLOGICAL CRISIS	PYRAMID PRIORITY	NOTES
GA *	Interaction of all living components in a specific area, including people.	EE is helping people to understand how they fit into their environment & how it affects them.	People do not understand nature; The greed of people.	4 2 11 6 9 1 3 7 5 8 10	This teacher did not attend the workshop, but sat in on the report back; His view of EE has changed from describing basic ecology to include social aspects, i.e. how people fit in and effect the environment. His view is more one of concern to protect nature.
NG	Study of ecosystems, should teach how to use an ecosystem to advantage - so that it can remain for generations to follow; EE should focus more on the local environment.				
LP *	Everything in child's environment; everything around him/her; how it is part of their development; not only plants & animals eg. energy use, electricity vs wood - squatter problems.	Not only about awareness; but to teach people they are part of a community & that education takes place in the community; not only protecting of plants & animals; can contribute to improving & protecting the environment.	People not aware of env. crisis; Not interested; It is about survival and existence.	1 11 2 10 6 3 8 4 5 9 7	Was not at conference, but has a good understanding of the env. - eg. not only awareness but how people socially-economically form part of environment; Effect of people on env. - she is concerned that people do not care about the environment; education problem.
CC	Learning process; Goal is to teach about awareness of env.; & how to appreciate env.; More relevant to children.	EE must strive towards guiding/educating people that the environment is the only source of survival.	That people do not really care for their environment; Our education system is not geared to protect the environment.	2 10 4 1 6 7 5 3 8 11 9	Initially his EE - awareness for children only; After conference; EE is for everyone; people dependent on env. (interrelationship); Problem with education system.
FT	Awareness of what is around you eg. plants, grass, even houses. To heighten awareness. To stimulate thinking (awareness) - politically, socially.				

JO	Integration of study between living & non-living components; how they influence each other; should understand env. & appreciate; Study of relationships; Not only reserves but also their own env.				
KH	Appreciation of flora & fauna; & protection thereof; taking into consideration indigenous & exotic.	Educating people to live sustainable with reference to their physical env. & socio-economic factors; not conservation only.	People are to pre-occupied with themselves; greedy, inconsiderate, the political & economical power & education.	1 10 2 8 3 7 5 9 4 6 11	After conference definition changed from ecology to a holistic approach in EE; sustainability also mentioned. Understands problems of world better.
DR	Pupil awareness of environment; interactions between organisms; Pupil should have respect for plants & animals; People's dependence on organisms.	EE incorporates a multitude of sectors (Eg. society, economics, politics); Education of individuals to be part of him/her env.; to sustain life on earth.	Abuse of power which humans have & exercise over other organisms. Too difficult to relate it to one basic problem. His basic problem encompass various other problems.	2 11 3 5 6 7 8 1 10 4 9	After conference - definition changed ecological (awareness, protection, dependence) to a more holistic one - all aspects (social, economics, politics); sustainability.
C v S	To conscientize illiterate who have been deprived from env.; Study of safe & protected liveable space & env.				
RI *	EE - life philosophy; part of being human; involvement; Awareness of what happens outside, not only in school; Principles in children.	Quality of life in others (people, animals or environment; People need to learn & acquire values to live in harmony with the environment.	People are too self-centred & ignorant. Everyone concerned about themselves & forget they form part of a world that needs to work together on survival.	1 6 4 10 8 11 3 7 9	Has a good understanding of the env. & problems; understands about values in EE; feels there is a problem with the education system (not been to conference)
CA	To identify problems in environment; and to address; Best way - to involve pupils & then pupils to involve community.	Education of people about their immediate env.; to educate better about people's environment; How it affects them; Plans to make the environment as pleasant as possible.	People do not realize the importance of the environment, do not see how pollution affects them; People accept it as the norm that air and streets are polluted; They feel it does not concern them so they do not need to worry.	1 6 2 5 10 8 4 3 11 7 9	Changed perception of working with children in problem addressing, to education for all people about the env. of how it affects them. He has a problem with the education system.
RH	Awareness of the environment; How humans interact with it; Survival of env. for years to come.				

DF	To make child aware of her env.; especially the immediate env.; problems therein; persons role in the env.; awareness to conserve environment.	EE is a life-long interwoven process which include biophysical, socio-economic, cultural and political aspects of society. EE can play a role in the attainment of a democratic life and should incorporate nation building; sustainable life for all.	Humans selfishness; self-centredness; modern scientific technology; lack of people to communicate effectively and constructively; the inability of authorities to assess & establish the needs of people.	4 11 2 10 8 3 5 7 1 6 9	Changed from a conservation outlook on env. to EE being holistic (as well as sustainable life for all).
ML	Broad field; not only biophysical env. but also linked to social problems; include all subjects; responsibility in children.	Too broad to give in one definition; to teach people to live sustainable in the environment where they live.	Modern science dominates; effects clearly visible today (eg. CFC's). Modern technology goes ahead without checking the effect on the environment.	1 11 10 2 3 5 6 4 7 8 9	Had a good understanding of EE (eg. social dimension but now sees it as more); Involves all people not only children; Also to live sustainably.
MW	Must be defined in school context; About syllabus related theory; Relevance to outside; Informal teaching.				
BF		Process whereby people realize they are part of/connected to everything & everyone and thus have a role to play in the immediate environment as well as global.	People has become alienated from the environment and has lost an understanding of how it functions. Creates damage sometimes knowingly; political and economical structures a problem.	1 8 6 11 7 2 3 10 5 4 9	Teacher joined project later; Focus on connectedness in environment eg. local & global.
HM		Education of educators; Development of resources to protect the environment & to make others aware of the importance of our environment.	Everyone is not educated in EE; there is too much focus on basic needs eg. money, food, work etc. Everyone does not realize how important the env. is.	5 6 1 2 7 4 10 11 3 8 9	Joined later; focus on development processes to protect the env.; education that is important for awareness of environment.
MK *		Education; Also people in the immediate environment; Advantages if they protect it; how this awareness & protection can lead to benefit in their social and economic problems.	Abuse of the environment; due to the greed of people; Low morale.	1 10 2 8 11 4 7 9 3 5 6	Still sees env. as protection & awareness; Realize it has to do with immediate environment; Understands problem in env. due to greed of people.

* Teachers who did not attend conferences but attended the follow-up workshops.

Key to Pyramid Priority

1	-	Ethics and values	2	-	Development to meet human needs
3	-	Green lifestyles	4	-	Population control
5	-	Appropriate technology	6	-	Environmental economics
7	-	Environmental politics	8	-	A global revolution
9	-	Feminist politics	10	-	Education
11	-	Modernity and postmodernity			

APPENDIX 9.1

OPEN DAY WORKSHOP - 14 OCTOBER 1995

ENVIRONMENTAL EDUCATION AND RESOURCES UNIT

PROGRAMME

09h00	Ice-breaker, Tea/Coffee	
09h30	Introduction to Environmental Education	Charmaine/Aadiela
10h00	'The other side of Environmental Education'	Sam/Gabriel
10h30	Integrating environmental education across the curriculum	Kevin
11h00	Case study	Cedric
11h30	Possibilities in environmental education	Hestelle/Bonnie
12h00	Problem-solving, cognition and environmental education	Desmond
12h30	Lunch	
	Resource Unit display and walk in Reserve	

APPENDIX 9.2

Open Day workshop proceedings

We started the workshop with an introduction on Environmental Education which one of the Unit's staff members (who was part of the project) and myself were going to present. She was unfortunately attending a course in environmental education at the time but sent me her activity for presentation. Her activity dealt with the objectives for environmental education and the clarification of values and attitudes. This was an activity she obtained from a workshop presentation of the 1995 EEASA conference held in Natal. In my presentation I provided some background on the development of environmental education, how it is defined and described, more recent developments in the field and in South Africa, and the role of organisations like EEASA. (For a programme outline of the workshop see appendix 9.1).

The activity on "the other side of EE" was a very lively one on how everything is related. The focus of this presentation was to show that environmental education was not only about the biophysical but that it also had social, political and economic features. The presenters used old newspaper (to illustrate how items can be re-used) for their diagrammes and other writings. They also handed out an information sheet called "Interbeing" to illustrate connectedness in the environment. These two participants succeeded well in explaining how social, economic and political issues impact on the environment. The other teachers could understand and see the relevance in the examples the presenters used to substantiate their presentation. They also suggested methods on how schools and the teachers could take action in environmental education. Overall, I felt that because of our ongoing interaction (interviews, workshops and informal meetings) these two teachers had developed a fairly good understanding of how everything is related to the environment and that environmental education is not only about "the interaction of all living components in a specific area" (Teacher GA, first

interview, Table 4.1).

The participant who presented the workshop on integrating environmental education across the curriculum, merely took an idea from an EEASA 1995 workshop (see Appendix 5) and stated that there were two ways of doing environmental education in schools. It can either be achieved through infusion (where it becomes part of all subjects) or by integration (making it a separate or extra subject). He emphasized the point that all the teachers present, including the three visitors in the workshop were either Biology, Geography of Science teachers, thereby illustrating the misconception that environmental education is for Science teachers only. His statement led to a lenghty discussion on how environmental education should be implemented but generally the teachers present were in favour of "infusion". A need was also raised for subject advisors to become better informed about environmental education.

The next two presenters met twice with each other and once with me to plan their presentation i.e. possibilities in environmental education. Their presentation consisted of many ideas for teachers on what to do with pupils. According to them teachers do not know what to do with pupils at the beginning of the year when the schools are either still waiting on textbooks or when textbooks still need to be delivered. The other suggestion was that these ideas could be employed if teachers had to supervise another teacher's (who might be absent) class. The idea sheets they presented were taken from books at the Unit. Then they suggested ideas for competions, eg. how to do a "wanted" poster on alien plants - taken from a resource book; competitions on model making - after seeing a model of a fish at the EEASA 1995 conference; growing plants for Arbor day (their own idea). These teachers' presentation reflected that teachers were still looking for ideas on how to practically do environmental education and they identified resource books as a possibility to provide this information to them. They promoted the Unit as a facility where

resources could be obtained.

In the case study presentation, the participant informed the meeting of his experiences in environmental education. He described how he started a forum and how he proceeded to get others interested. His environmental education activities were not limited to the school pupils or teachers alone, but also formed part of community activities, other schools and the local RDP environmental branch. He continued by discribing how his involvement with the Unit and attending the EEASA conference had changed his ideas about environmental education.

The last presenting teacher provided a very theorethical talk on problem-solving. He adapted the information he obtained from one of the EEASA 1995 workshop presenters and tried to relate it to environmental education. His talk was superficial and revealed nothing about his understanding of environmental education. This could be seen as another example of how teachers find it easier to simply adopt an idea without being able to implement it in their practice. Before the Open Day meeting, this teacher stressed that it was difficult for teachers to make environmental education part of practice.

APPENDIX 10.1

Table 4.10. Difficulties participating teachers experienced in the process of doing environmental education

	Frequency mentioned *
1. Education system presents problems: subjects are too compartmentalised, ee is not part of the syllabus	6
2. Most teachers generally lack initiative and are used to being treated in a "top-down" approach	3
3. Teachers' time to do extra work, such as ee, is limited	3
4. Lack of materials and expertise to introduce ee to the other teachers	2
5. There is a need to make other teachers also aware of the importance of ee	2
6. EE is too "theoretical" (there is a need for practical examples)	1
7. Teachers lack confidence to do ee	1
8. To few ee centres and access to them is difficult (costs, distance)	1
9. Teachers find it difficult to make the relevance of ee clear to all people	1
10. Difficult to do ee in societies with certain views, norms and expectations (their views need to change first)	1

* The six teachers' (who presented at the workshop) responses to difficulties in the implementation of Environmental Education overall, especially as they experienced it. Some gave more than one response.

[ee = environmental education]

APPENDIX 10.2

Table 4.11 Recommendations suggested in response to the difficulties mentioned in table 4.10.

Recommendations	Frequency mentioned *
1. Resources, centres and availability should be advertised better	4
2. Whole curriculum should change so that EE becomes part of it	3
3. Teachers in general are to become equipped to do EE	2
4. Communities should also be in-volved in EE, EE should happen at grassroots level	2
5. The Education departments should be involved in EE	1
6. Start consciousraising groups in EE	1
7. EE to become part of tertiary studies for teachers	1
8. Pupils should be motivated to become part of EE projects	1
9. Schools should compile their own resources for EE, with the assistance from the EERU	1
10. The role of parents in the development of children should be addressed	1

* These are the responses of those six participating teachers who did presentations at the Open Day. Some gave more than one response.

APPENDIX 11

Environmental Education Workshop

RESOURCE DAY

Hosted by the E.E.R.U.

(08h30 -15h30)

8 March 1996

Programme

1. Welcome
2. Background
3. Introduction to Environmental Education
4. Introduction to the CFNR
5. Guided walk in CFNR and Nursery
   - Activities
   - Questions
6. Lunch
7. Brainstorm session
8. EE and continuous evaluation
   - Std 6 - 10
9. Recommendations
   - Plan of action
10. End

Contact EERU : 959 2498

Education Officer : 959 3384

TUESDAY 9 JULY

SESSION 1 08h30-09h20

Welcome Chair: Dr Danie Schreuder **Introductory Address: Mr Brian O'Connell** Superintendent General of Education Western Cape Education Department	Room 230

SESSION 2 09h30-11h00

Research and Policy - Chair: Nelleke Bak *Special Session* Paper: **Eureta Janse van Rensburg** *Researching for Change: Scholarship ENTERPRISE* Panel: **Maria Mbengashe, Mathilda Roos, Elliot Mbolekwa, Mba Manqele, Thsidi Tselane, Jackie Kruger**	Room 230 Academic Paper and Panel R&P
Classroom & Fieldwork Practice Chair: Matsiliso Semmelink *Special Session (A Lesotho Case Study)* Paper: **Tsepo Mokuku** *Facilitating Reflective Practice in Science Curricula: Towards Education for Environmental Literacy in Lesotho* Panel: **Phelane Lebuso, Mamohau Mapesela**	Room 229 Academic Paper and Panel CFP

09h30-10h10

Athol Hockey *A Pilot Study of Secondary Teachers' Understanding of Population Dynamics*	Room 223 Illustrated Talk ATE
Emmanuel Edomwande *DDT in Southern Africa: Time for a Change*	Room 225 Illustrated Talk CBP

10h20-11h00

Douw Steyn *The Integration of Population Education in the Senior Primary School Syllabi:* The Easy Way	Room 223 Illustrated Talk CBP
Charmaine Klein *Teacher Understanding of and Participation in Development of Programmes at EE Centers*	Room 225 Illustrated Talk ATE, EEC

TEA 11h00-11h30

SESSION 3 11h30-12h30 or 13h00

Suzelle van der Westhuizen *A Critical Evaluation of the Upliftment of the Labour Force*	Room 220 Workshop ATE
Michael Marzolla *A Progress Report of the Roots & Shoots and 4-H SERIES Collaboration: "Snails to Alpha Males"*	Room 223 Workshop CD
Ian McKay, Maria Lycoudi, Beverly Bell, Xenia Kyriacou *Managing Change: A Workshop of Hands-On Environmental Activities Aimed at Primary and High School Pupils and Teachers*	Room 224 Workshop CFP

--continued on next page--

Nicola Jenkin, Barbara Jenman, Joan Fester, James Nowicki *The Development of Relevant and Appropriate Waste Education Materials*	Room 226 Workshop RMD
Ursula van Harmelen and Di Wilmott *Us Practical Ou's and Environmental Education Theory: Unpacking the Jargon*	Room 227 Workshop R&P, MNC

11h30-12h10

Nelleke Bak *Judging Change and Changing Judgments: An Expanded Notion of EE*	Room 229 Academic Paper R&P

12h20-13h00

Rob O'Donoghue *Detached Harmonies: A Story of Developing Social Processes of EE...*	Room 229 Illustrated Talk CBP

12h30-13h00

BUZZGROUPS Informal, open sessions. Reserve a room & inform delegates

LUNCH 13h00-14h00

SESSION 4 14h00-15h30

Perspectives on the National Qualifications Framework *Special Session* Chair: Ally Ashwell Paper: **Seamus Needham & Ross Torr:** *Structural Implications of Outcomes Based Learning for Further Education and Training* Paper: **Heila Lotz:** *Curriculum 2000: Environmental Education Perspectives on a Changing Curriculum for General Education* Paper: **Bridget Hughes:** *Alternative Assessment for Outcomes Based Learning: Implications for Environmental Education*	Room 230 Academic Papers R&P
Att Botha and Cheryl Ogilvie *Towards a B Tech Degree in Environmental Education*	Room 222 Workshop ATE
Claude de Speville *Earth Citizenship: A Foundational Approach to Environmental Education*	Room 224 Workshop EEC
Kim le Roux, Clare Holland, Nathi Makhaye *Share-Net: Exploring Low-Cost Resources to Support EE*	Room 226 Workshop RMD
Willeen Olivier *National Information System: How, What and Why*	Room 228 Workshop MNC

14h00-14h40

Di Goodwin *Colleges of Education Environmental Project (CEEP)*	Room 227 Illustrated Talk ATE

14h45-15h30

Ian Milne *Park-Based Environmental Interpretation: Service or Strategy?*	Room 227 Illustrated Talk MNC

TEA 15h30-16h00

16h00-17h30	NETWORKING SESSIONS AND DISPLAYS

WEDNESDAY 10 JULY

SESSION 1 08h30-09h15

Keynote Address Chair: Danie Schreuder **Ian Robottom** *Permanently Peripheral? Opportunities and Constraints in Australian Environmental Education*	Room 230

SESSION 2 09h30-11h00

Curriculum and Resource Development *Special Session* Chair: Alistair Clacherty Paper: **Kantilal Parshotam** *Problem-Based Learning Approach to Curriculum Development in Environmental Education* Panel: **Mascha Ainslie, Mbuyi Mhlauli, Kim le Roux, Joan McLoughlin**	Room 230 Academic Paper and Panel CD, RMD
NJS Basson *Learning to Change Your Learning Strategies*	Room 226 Workshop CFP
Nel Smit *Dressing Trees and Worm Races: Stories of Landcare Education from Australia*	Room 222 Workshop CBP

09h30-10h10		10h20-11h00	
Nigel Adams *The Importance of Ground Water Awareness and Education in Rural Areas*	Room 225 Illustrated Talk CBP	**Boniface Alcobua** *Groundwater Training and Awareness Building Extension Programme*	Room 225 Illustrated Talk CBP
Graham Taylor *Recreation and Environmental Education: Lessons from the Mountain Bicycling Movement*	Room 229 Illustrated Talk CBP	**Steven Maqobozo** *Environmental Education Programmes for Bop Parks*	Room 229 Illustrated Talk CBP

TEA 11h00-11h30

SESSION 3 11h30-12h30 or 13h00

Juanita Pastor *Our Cultural Environment: Workshopping a Poster for Primary Schools*	Room 222 Workshop RMD
Ally Ashwell & Cynthia Slattery *Approaches from the Development Education Centre*	Room 224 Workshop CFP
Shara Khamis *Active Involvement of School Teachers*	Room 226 Workshop CD
NEEN (Namibia EE Network) *Snakes and Ladders: An Interactive Game of Change in Namibia*	Room 229 Workshop MNC

--continued on next page--

11h30-12h10		12h20-13h00	
Anthony Mkhabela *The Role of Ndumo Environmental Education Centre in Rural Development Programmes*	Room 227 Illustrated Talk CBP	**S. A. Selaledi** *The Role of Women in the Transformation of South Africa with Specific Reference to Small Scale Gardening*	Room 227 Illustrated Talk CBP
Malcolm Plant *Initiating Change at a Distance: Challenging Responsibilities for the Environmental Educator*	Room 223 Illustrated Talk R&P, ATE	**Callie Loubser** *Learning to Change Towards an Environmental Education Focus at a Tertiary Institution*	Room 223 Illustrated Talk ATE

12h30-13h00

BUZZGROUPS Informal, Open Sessions. Reserve a room & inform delegates

LUNCH 13h00-13h30

EXCURSIONS

Please book and pay in advance - Buses depart at 13h30 sharp

Two Oceans Aquarium The recently opened Two Oceans Aquarium highlights the unique ecological conditions created by the meeting of the Atlantic and Indian Oceans. You will tour the aquarium with an environmental education specialist.	Limit: 60 people Cost: R10 per person
Imax Theatre Watch the film *Africa, the Serengeti* on the gigantic IMAX movie screen. Before the show, take a relaxed, window-shopping tour of the Victoria and Alfred Waterfront.	Limit: 60 people Cost: R15 per person
Kirstenbosch National Botanical Garden Kirstenbosch is famous for its collection of native plants of southern Africa. It is well known not only for its beautifully tended gardens, but as a special sanctuary for plants of the fynbos ecosystem. Tour the gardens with the education officers. Bring money for the tearoom and shop! The tour WILL NOT be cancelled if it rains - just bring youor wet weather gear.	Limit: 60 people Cost: R5 per person
Spier Wine Estate Wines have been produced in the Stellenbosch district since the town was founded three centuries ago. The combination of cool climate and fertile soils creates some of the Cape's finest wines. Sample a selection of these at the Spier Wine Estate. If time allows, have tea or visit the estate's museum.	Limit: 42 people Cost: R7.50 per person
Jonkershoek Nature Reserve (weather permitting) Jonkershoek, with its landmark twin peaks, is the home of some of the Cape's earliest conservation efforts. Learn about the reserve's riverine ecosystem. Visit the fresh water aquarium and trout hatchery. The fishery also breeds endangered indigenous fish for reintroduction. Later, take a guided walk through the fynbos to a lovely waterfall.	Limit: 30 people Cost: free
Abalimi Food Gardens (weather permitting) Find out how residents of some of Cape Town's townships are helping to feed themselves and their families through community gardening.	Limit: 35 people Cost: R4 per person
Stellenbosch Self Tours Tour Stellenbosch's historical neighbourhoods, shops and museums. Other attractions, such as the Bergkelder Wine Estate, are within walking distance of the University. See the map provided in your registration folder.	No limit or cost

THURSDAY 11 JULY

SESSION 1 08h30-10h10	
Environmental Education Curriculum Initiative (EECI) *Special Session 08h30-13h00* **Presenters:** Dr E Botha (Director General: Dept of Education), Heila Lotz, Kevin Winter, Linda Paxton, Mba Manqele, Alistair Clacherty (Chair)	Room 223
Community Based Programmes *Special Session* Chair: Rob O'Donoghue **Paper:** Peter Mills *Integrating Conservation and Development: A Case Study of the Rust Der Winter Land Reform Project* **Panel:** S. A. Selaledi, Kathy Maasdorp, , Thlokomelo Fani Malcolm Taylor, Mike Marzolla	Room 230 Academic Paper and Panel CBP
Mervyn Wilson *The Role of the Council for EE Centres and Other Insititutions (CEECI)*	Room 225 Workshop EEC
Lynette Masuku-van Damme *Challenges in Environmental Education Resource Development and the Underlying Concerns*	Room 227 Workshop RMD
Jay Singh *DEA&T: Changes in Departmental Publications*	Room 229 Workshop RMD

SESSION 2 10h20-11h00	
Environmental Education Curriculum Initiative (EECI) *Special Session, 08h30-13h00 (Continued)*	Room 223
Gary Small *Water Supply and Education in Rural Areas: A Central African Experience*	Room 225 Illustrated Talk CBP
Rebecca Kelly *The EMS as a Catalyst for Environmental Education in Gold Fields of South Africa*	Room 227 Illustrated Talk ATE, R&P
M. B. Barnes *Environmental Award System for Youth--A Schools Package for Grades 5-7*	Room 229 Illustrated Talk RMD
Theo Manuel *The Wolfgat Nature Reserve Project: Demonstrating a Critical Orientation Needed for Education Change and Reconstruction*	Room 230 Illustrated Talk CFP

TEA 11h00-11h30

SESSION 3 11h30-13h00	
Environmental Education Curriculum Initiative (EECI) *Special Session, 08h30-13h00 (Continued)*	Room 223
Oupa Lebeloane *Can the "Amoeba Model" Solve the Dilemma of Teaching In, For and About the Environment?*	Room 222 Workshop CFP
Annette du Plessis *Bringing the Rain...*	Room 224 Workshop CMD
John Fien *Teaching for Critical Thinking*	Room 230 Workshop CFP
Zann Hoad, Val Thomas & Miranda Cuefer *Language for Change: Communicating in the New South Africa*	Room 229 Workshop MNC

11h30-12h10		12h20-13h00	
Jackie Byrne, A. Mathee & N. Coulson *Aspects of the Greater Johannesburg Healthy Schools Programme*	Room 225 Illustrated Talk CBP	Thlokomelo Fani *Getting to First Base*	Room 225 Illustrated Talk CBP
Mike Bruton *Window to the Ocean: Environmental Education Opportunities at the Two Oceans Aquarium*	Room 227 Illustrated Talk EEC	Sigi Howes *The Western Cape Education Department's Aim for Conservation Education*	Room 227 Illustrated Talk EEC

LUNCH 13h00-14h00

SESSION 4 14h00-15h30	
The EEASA Annual General Meeting *All Conference delegates are welcome to attend.* *However, only EEASA members may vote.* *An EEASA Council meeting will follow the AGM*	Room 230

TEA 15h30-16h00

16h00-17h30	NETWORKING SESSIONS AND DISPLAYS

FRIDAY 12 JULY

SESSION 1 08h30-09h15	
Keynote Address Chair: Dr Danie Schreuder **Paul Hart** *Environmental Education Within Canadian Elementary Schools: Understanding Teacher Thinking and Practice*	Room 230

SESSION 2 09h30-11h00	
Adult & Teacher Education Chair: Dr Callie Loubser *Special Session* Paper: **Kevin Winter** *Teacher Training in Environmental Education: A World of Difference* Panel: **Chris Reddy, Leslie le Grange, Malcolm Plant, Marion McKay,**	Room 230 Panel ATE
Water Quality Monitoring (WQM) *Special Session* Chair: Dr Danie Schreuder Chair: **Danie Schreuder** *The Future of Low Cost Water Quality Monitoring in South Africa* Panel: **Ina de Lange, Di Beeton, Graham Pearson, Steve Camp, Rob O'Donoghue, Ian McKay, Beverley Bell**	Room 225 Academic Paper and Panel WQM
Doctor Shongwe *Environmental Education as an Integral Part of an Environmental Management System*	Room 222 Workshop ATE
Cheryl Ogilvie *Needs, Methods and Techniques to Achieve a Cleaner, Greener Environment*	Room 224 Workshop CD
Peta-Jane Sinclair and Lesely Freedman Townsend *The Quest for Cultural Democracy Through Heritage Education*	Room 226 Workshop RMD

TEA 11h00-11h30

SESSION 3 11h30-12h30	
Critical Comment on EEASA '96 *Special Session* Chair: Maria Mbengashe Panel: **Ursula van Harmelen, Nelleke Bak, John Fien**	Room 230

12h30-13h00
Vote of Thanks and Conference Closure

LUNCH 13h00-14h00

APPENDIX 13

Vignettes of four participatory teachers

APPENDIX 13.1

Teacher CC:

This teacher was approached to become part of the study because of his apparent interest in environmental education. He had an environmental club running at his school and had approached the Unit in the past for assistance. Because so many of the other teachers whom I had interviewed stated they were unhappy in the teaching profession, I was curious to know how this teacher felt, but discovered that he was happy with teaching.

In his initial description of environmental education Teacher CC said that environmental education was "a learning process with the purpose to protect and appreciate the environment; it is more relevant to children, and children should understand the reason why environmental education is important".

After the EEASA conference, he stated that he had learnt a lot from others at the conference. Attending the conference was a very motivating experience for him and he felt he "could start his environmental education projects all over". In his description of environmental education after the conference, he added that environmental education should attempt to let people realize that the environment is the only source to survival (i.e. the dependance of people on the environment).

Despite his school also having a carnaval (for fund-raising) on the same day as the Open Day workshop, he still presented his case study, thereby demonstrating his commitment to environmental education. In his presentation, he described how his view on environmental education had changed from a focus on awareness of the natural environment to one which include socio-economic and other factors (an indication of a broader view). His view reflected a better understanding of environmental education. He also, though pointed out that the education system made it difficult for teachers to practice environmental education. In

his final recommendation for environmental education programmes, he suggested that teachers use their own ideas and decide for themselves how to do environmental education programmes. This notion of his hint to a more individualistic approach.

This teacher initiated several projects on his own at his school (eg.indigenous planting projects giving individual classes responsibility for each plot). He also took groups out on his own and sometimes asked Unit staff to accompany him. In a separate exercise this teacher blamed individuals for the environmental crisis.

APPENDIX 13.2

Teacher ML:

This teacher initially approached the Unit to establish closer links. She works at a school which is situated in a lower socio-economic area. The school is often broken into and gangsterism in the area is a common phenomenon. I once had to cancel a visit to the school after a school pupil was knifed by gansters who entered the school. The school was closed early after the incident. On some of my visits I noticed heavy police protection on the premises guarding the entrances and back of the school. Despite these problems, this teacher started activities such as recycling at school. She informed me that their recycling materials were often stolen.

In the first interview she described environmental education as involving social problems, "it includes all subjects and is not only about the natural environment". Further, environmental education cannot be separated from natural, social and economic conditions. All of these, according to her, contributed to environmental problems. In a separate exercise she blamed social structures for the environmental problems.

She described the 1995 EEASA conference as a motivating experience. The workshops gave her courage to carry on, despite the difficulties of the working conditions. She made several contacts at the conference. After the conference she described environmental education as a very broad concept, too broad to be encompassed in one definition. To her it was about people living sustainably in the environment "and much more".

Unfortunately, due to illness in her family, she could not deliver her presentation at the Open Day workshop. She intended to present a talk and play on sustainability. The play was obtained from an EEASA workshop, but she modified it for the purpose of the presentation.

In the follow-up interview she explained that the reason why most teachers had problems with doing environmental education, was because they felt compelled to follow the prescribed syllabus. She felt she could change the syllabus to include environmental education. In her requests for environmental education she stated that she wanted more teacher education programmes.

Teacher ML started to visit the Unit on her own to liaise with the horticulturist for school greening projects and to make use of other resources. At one stage of the project, teacher ML felt that she should focus more attention on learning to understand Xhosa and accommodating pupils with extra classes. This would have prevented her from participating in environmental education. However, later she continued her work with the Unit (i.e. indigenous greening) and brought her pupils to the Unit for life-skills workshops.

APPENDIX 13.3

Teacher HM:

This teacher was not interviewed initially but she showed an interest in the project and accompanied a colleague to the first workshop. From then onwards she remained part of the project and never missed a meeting or a workshop.

She felt the EEASA conference had broadened the concept of environmental education for her. Her perception of environmental education after the conference included more than just ecological studies. She described the importance of education of the educator and the development of resources to protect the environment and to make others aware of the importance of our environment.

This teacher spend a lot of time preparing for the Open Day workshop (3 visits to the Unit). However, her presentation consisted of how teachers could use resources to keep pupils busy when they had to supervise these pupils in the case of an absent colleague. She gave examples of worksheets that she copied out of resource books at the Unit (demonstrating an uncritical use of resources and not rooted in her own practice). In one of her recommendations for programme development for teachers she suggested ideas and examples to be presented to the teachers, simplified ideas and ideas which they could apply without any difficulty.

In the follow-up interview, this teacher said that the programme we were busy with, i.e. this study, was not always very clear to her. This was despite my letters and summaries of the processes which I always gave to the teachers after the events. She did, however, inform me that she learned more about environmental education. Another benefit of the project for her was that she was introduced to the Unit and was now using the Unit more. Another comment from her was that she did not really need support

from other teachers, she was looking more for something she could use on her own, like examples for her school programme. She started to use the Unit by visiting on her own. Although this teacher will be a full-time student next year (to do post-graduate studies in Education), she still indicated that she wanted to remain part of this project. She adopted an individualistic approach to the root problem in the environmental crisis. (Subsequently, she enrolled for a higher degree in Education (B.Ed.) and chose to do a module in environmental education. Teacher ML later became so involved in environmental education that she even accompanied me to the EEASA regional meetings. She asked for reports on the Unit and came back with useful recommendations. Another request of hers was to do a "shadow" study of me during 1997.

APPENDIX 13.4

Teacher DR:

Before the start of this study, this teacher brought his pupils to the Centre and nature reserve. In his first interview he had, he was not happy with teaching and informed me that he would like another job. His definition of environmental education was that it was the active awareness making of pupils of their environment, the interaction of people with other organisms, for pupils to have respect for plants and animals and to realize their dependency on the environment (his focus was thus on nature).

He felt that the conference changed his concept of environmental education. That his understanding of environmental education was now broad, incorporating a multitude of sectors like the influences of politics and economy, and the general education of individuals to live sustainably. His presentation at the Open Day workshop was a very theorethical one on problem-solving, an idea he took from one of the 1995 EEASA conference workshops.

He did not attend the last meeting to plan for the following year, but in the last interview I had with him, he felt environmental education should be applied more practically with worksheets or a booklet for teachers on "how to do" environmental education. He wanted to remain part of the project in the next year. In a separate exercise with the participants, he blamed social problems for the world environmental crisis.

APPENDIX 14

August 1995

Teacher :
School :
Address :

Dear Teacher

Programme development at an environmental education centre through action research involving secondary school teachers

This letter serves to summarize for you the developments up to this stage and also to brief you about possible further developments with regard to the abovementioned programme.

The programme started out with the following goals : i) to develop relevant and effective programmes at the Environmental Education & Resources Unit (EERU), based at UWC, which will suit the needs of teachers and ii) to clarify a socially critical approach to environmental education.

The method for this process is action research. This method allows for collaboration between the teachers and the Centre as well as continuous dialogue between both parties. The action research method develops through a series of cycles by identifying a problem, planning an action in response to that problem, then acting (by implementing plans), observing what happens after the implementation, then reflecting and possibly re-stating the problem, re-planning, more or further implementation, observing and reflecting.

Thus far the action research process has been as follows : In the first cycle, a problem was identified that teachers find it difficult to do environmental education projects on their own, either at schools or at centres. Through semi-structured interviews it was determined from the teachers that this could be related to their understanding of environmental education and their educational backgrounds as well as various other factors which made practising environmental education at schools difficult. The centre on the other hand identified a need to improve its existing programmes or develop new programmes (in order to address the needs of teachers), but at the same time to also develop a better understanding of environmental education.

The initial data collected from the semi-structured interviews with 15 teachers was presented at a follow-up workshop. In this workshop teachers discussed and prioritized the issues they felt had to be addressed, keeping the above goals in mind. These outcomes led to the second cycle in the action research process, ie. that teachers needed teacher development programmes, that they have problems at schools (ie. lack support from others at school, has to deal with socio-economic problems, etc.) when a decision was taken for teachers to attend the 1995 Environmental Education Association of Southern Africa (EEASA) conference, to assist them with the clarification of environmental education. At the conference teachers had the opportunity to sit in and participate in various workshops. Some workshops focussed on the concept 'environmental education', whilst others focussed more on what is happening in the field of environmental education (networking; interaction; etc.). Meetings held during the conference, indicated that the teachers felt that their concept of environmental education had broadened and that they needed to get together to compare their views. According to them, the conference also made them learn more and gave them better insights to projects and how to tackle projects in their schools and communities. The follow-up to this was to hold a workshop to reflect on the EEASA conference and to look at the concept of environmental education.

In this second workshop, participants first reflected on the conference and then suggested possible future

action for the programme. The conference proved to be of great benefit to the teachers not only i.t.o. motivating them to start their own projects, but also by succeeding in broadening their understanding of environmental education. Before EEASA teachers felt, according to themselves, that they had a narrow perception of environmental education, and after the conference, teachers felt they could link social, economic and political aspects to the environment.

The reflection on this cycle made the participants identify that the following aspects needed to be addressed:

i) teachers need support at school;
ii) how environmental education fits in with the curriculum;
iii) teachers need to determine what the needs of the school are;
iv) staff development for the whole school is needed;
v) how the centre can support teachers in bringing environmental education into schools;
vi) some kind of environmental education competition to involve others; and
vii) to start a small-scale project with interested teachers at all the schools, perhaps on 'An introduction to environmental education'.

The teachers felt that it would be important to do a needs assessment study at all their respective schools. They are currently busy with this and I will be contacting the individual schools shortly to get feedback from the teachers.

For phase three of the cycle the suggestion of doing a small-scale study will be further explored. In the previous workshop some teachers suggested that we draw in all the interested teachers at the different schools and run programmes for them. Those teachers will then later draw more teachers into the project until the 'whole school' becomes part of the programme. Following this route would encompass most of the objectives set out to be addressed in the previous cycle. For the next workshop the following is suggested: current participating teachers to bring along their interested colleagues; the process and programme thus far will be explained; and specific programmes on environmental education will be presented. This workshop might possibly run over a two day period. The purpose is to help draw the interested teachers into the process and to help them to come to a better understanding of environmental education.

You are therefore cordially invited to attend a special planning meeting where we will discuss how and where, as well as drawing up a programme for the suggested 2-day workshop. A meeting has been arranged for Friday, 25 August 1995, at 15h00 at the home of Charmaine (details on enclosed map).

Your sincerely

Charmaine Klein
Project Coordinator

Copy to the Principal

APPENDIX 14

18 September 1995

Ms H Mellville
Belhar SSS
Suikerbossie Way
Belhar 7490

Dear Hestelle

OPEN DAY WORKSHOP : ENVIRONMENTAL EDUCATION, 14 OCTOBER 1995

This letter serves to summarize for you the outcomes of our last meeting held on 25 August 1995 to plan the above day (open day workshop). The workshop is planned to involve other teachers from your school. Enclosed please find a copy of the letter which you are to give to the teachers you have identified in your assessment as those who are willing to participate by attending the workshop and who are also the ones who have indicated that they are willing to support what you are doing. Remember the aim of the workshop is to introduce these teachers, your colleagues to the EER Unit, to Environmental Education and also to show to them, in a creative way, how to implement environmental education in their work. I have not filled in their names on the accompanying letter, but left space for you to do so on the dotted lines. Please also give a copy of the letter to your principal and invite him along.

At our last meeting, all the teachers present reported back on the assessment each carried out at their respective schools. All the teachers, in the assessment, identified individuals at their school who could be involved in the small scale study we as a forum decided on. These interested teachers (identified by you) at the different schools will now be drawn into the programme and we all (the forum) will run a one day programme on environmental education for them. In bringing your interested colleagues to a better understanding of environmental education we decided to do this workshop in a very creative way, ie. to move away from the lecture type presentations but rather make it more interactive, building on what your colleagues already know.

It was proposed that we run a trial programme on 9 October 1995 at 15h30 at the EERU to evaluate ourselves and to ensure that we are on the right track. Please remember that your preparation need to take place in close conjunction with myself or people we jointly identify as those who are regarded as authorities in the field. By doing so we will maintain a high standard in our presentations. Also, because we are running a one day programme on 14 October, it is imperative for you to present your work at the meeting of 9 October, because we will be constrained by various factors, such as time, content, etc. in our presentations. Anybody who cannot make it for 9 October should please arrange to meet with me individually before the time so that we can go through your presentation.

Very briefly again, the programme decided on is as follows :

14 October 1995, At the EER Unit, UWC

09h00	Ice-breaker, Tea/Coffee	
09h30	Introduction to Environmental Education	Aadiela/Charmaine/All
10h00	'The other side of Environmental Education'	Gabriel/Sam
10h30	Integrating EE across the curriculum	Conrad/Kevin
11h00	Tea/Coffee break	
11h15	Sustainability : Play / Talk	Marlene/Donovan
11h50	Case study of a teacher	Cedric
12h10	Possibilities in EE - Competitions & Games	
	Developing resources	Hestelle/Bonita
	Networking	Marilyn
	How to use an EE Centre	Charles/Rosalind
13h15	Lunch	
14h00	Problem-solving, cognition and EE	Desmond
14h30	Evaluation and planning	
	Tour of EER Unit	Tracy/Charmaine
	Refreshments (eg. potjie-kos or braai)	

This workshop should be seen as part of our joint programme we decided on, i.e. to develop programmes at an environmental education centre for ourselves, the school and for the centre. In this way we are involving more teachers to assist you and also make the Unit more user-friendly. Please remember this is still in line with what you have decided on in our previous workshops as part of the action to be taken.

Contact me regarding any queries you have about any aspect or difficulty in the process.

Yours sincerely

Charmaine Klein
Project coordinator

Copy to : The Principal

Ps. Teachers who did not form part of the early workshops or planning meetings are most welcome to attend and to bring some of their interested colleagues with. Please find enclosed a letter with dotted lines to fill in their names. **Please let me know if you are coming so that I can make special arrangements for seating and catering.**

APPENDIX 15

19 September 1995

Teacher : .....

School : .....

Dear Teacher

OPEN DAY WORKSHOP : 14 OCTOBER 1995, EER Unit, UWC

Over the past couple of months a group of teachers participated in various kinds of programmes at the EER Unit to broaden our understanding of environmental education which we now perceive as not to be dealing with the natural environment only, but also social, economic and political aspects. Also, we realise that it has to do with all the different subjects at school. Furthermore, current initiatives are underway nationally to make environmental education part of the whole curriculum. To introduce you to this, a workshop is planned. This workshop is therefore not geared at teachers in Science or Geography only, but it is aimed for teachers at all levels and for all teachers. It will be to your benefit to attend, especially seeing that the workshop will be presented mostly by other teachers who have a good understanding of what happens in schools and not the 'experts' from outside. You are therefore cordially invited to come and share in this event which will take place on **14 October 1995** at **09h00** at the **EER Unit** of the University of the Western Cape. Feel free to bring along teachers you feel might benefit from this endeavour. Herewith follows a programme outline for the day :

14 October 1995, At the EER Unit, UWC

09h00	Ice-breaker, Tea/Coffee	
09h30	Introduction to Environmental Education	A.Moerat/C.Klein/All
10h00	'The other side of Environmental Education'	G.Africa/S.Noembdoe
10h30	Integrating EE across the curriculum	C.Adendorff/K.Henderson
11h00	Tea/Coffee break	
11h15	Sustainability : Play / Talk	M.Lintnaar/D.Fullard
11h50	Case study of a teacher	C.Cyster
12h10	Possibilities in EE - Competitions & Games	
	Developing resources	H.Mellville/B. Fernandez
	Networking	M.Klein

	How to use an EE Centre	C.van Schalkwyk/R.Izally
13h15	Lunch	
14h00	Problem-solving, cognition and EE	D.Roman
14h30	Evaluation and planning	
	Tour of EER Unit	T.Sampson/C.Klein
	Refreshments (eg. potjie-kos or braai)	

Kindly inform your contact teacher at your school whether you are able to attend so that seating and catering can be arranged or contact the Unit directly on Tel.959-2498 (Secretary).

We look forward to seeing you there.

Yours sincerely

Charmaine Klein
Project coordinator